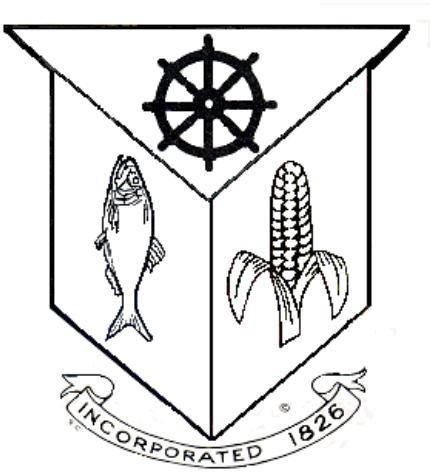
MADISON HEALTH
DEPARTMENT

WATER POLLUTION
CONTROL AUTHORITY

HOMEOWNER'S GUIDE TO SEPTIC SYSTEMS, OTHER SOURCES OF POLLUTION AND WELLS



October 2003

INTRODUCTION

Welcome to Madison!
We hope you will enjoy your home. As you may know, your home is served by a septic system (on-site subsurface sewage disposal system), and possibly a well. In addition to this, the street on which you live probably has one or more catch basins or storm drains that carry street runoff to a nearby stream, wetland or Long Island Sound. This pamphlet will help you understand the components, operation and maintenance of your septic system and well water system. It also explains simple things you can do to minimize pollution of the streams and wetlands throughout town as well as Long Island Sound.

- The septic system serving your home is designed to collect, treat and dispose of all sewage generated in your home. It is not designed to receive toxic or hazardous materials such as solvents, paints, oils or other such chemicals or large amounts of cooking grease. Such toxic materials can destroy your septic system and contaminate ground and surface waters (wells and streams).

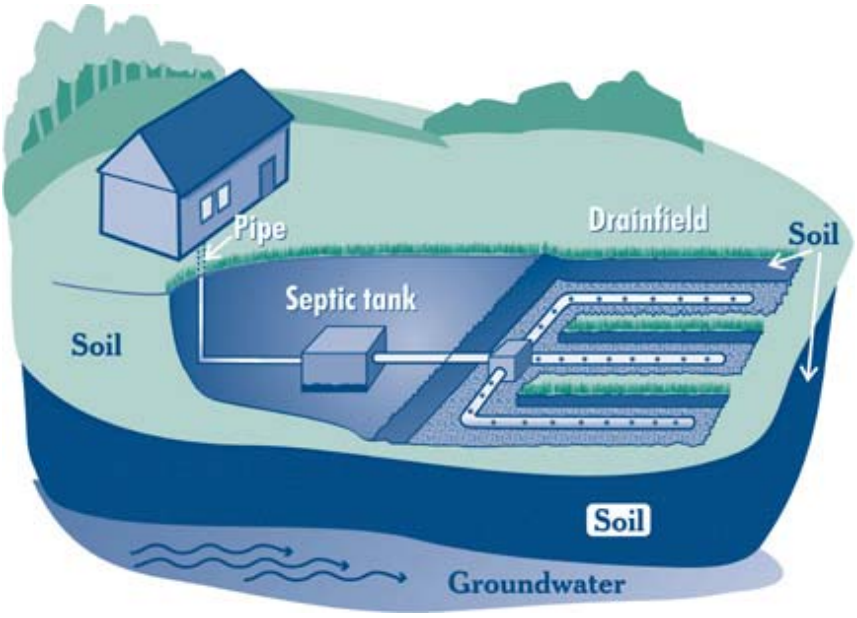
- **Madison has no sewers** and is actively involved in a sewer avoidance program to ensure that it will never need sewers. The installation of sewers often causes an increase in the density and change in the type of development. The sharp reduction of state and federal monies for construction of sewers over the past several years has made the installation of sewers vastly more expensive and reinforced the Town's commitment to its reliance on septic systems. Therefore, the proper operation and maintenance of your septic system is important to you and your Town.

- As a shoreline town, Madison has an opportunity to enjoy Long Island Sound and also a unique responsibility to protect the Sound. All of the rain that falls on Madison ends up in the Sound, and as this rain travels over and through the ground it can pick up various pollutants. Lawn fertilizers, pesticides, animal wastes, faulty septic systems and cesspools and drips from motor vehicles are some of the sources of contamination to the ground and surface water that makes its way into Long Island Sound.

YOUR SEPTIC SYSTEM

Your septic system is a simple yet effective sewage treatment and disposal system buried in the ground. The pipe (sewer) from the house is connected to a septic tank. The septic tank is, in turn, connected to a leaching system. The sewage flows by gravity from the house to the septic tank where large particles sink to the bottom of the tank, while grease and fats float on the surface of the liquid. The remaining liquid flows out of the septic tank into the leaching system (leaching trenches, galleries, or drywells) where it is allowed to soak into the ground. Some homes may have a sewage pump to lift the effluent from the septic tank up to the leaching system. Some older homes have one or more cesspools, which are large, hollow pits, often constructed below the water table, **which are not effective sewage treatment systems** and should be replaced.

Solids in the sewage settle and collect on the bottom of the septic tank to form sludge. Fats, grease and hair float and form a scum layer on the surface of the septic tank. If these materials are not removed periodically by cleaning (every 3 to 5 years is normally required), they will overflow the septic tank and clog the soil pores in the leaching field. A clogged leaching field will not accept wastewater and must be replaced, which is a very costly operation. Septic tanks installed since 2000 contain a filter that may need to be cleaned every few years.



(Picture courtesy of US EPA) Cross Section of Septic System

Leaching systems are intended to disperse the liquid overflow from the septic tank (effluent) into the surrounding soil. There are a variety of leaching systems in use, such as leaching trenches, concrete and plastic galleries, drywells, and other structures. They all perform the same basic functions; to store and disperse liquid sewage into the soil. The septic tank pretreats the sewage and the leaching system and surrounding soil provide additional treatment of this material. Properly sized septic systems provide very good removal of most common contaminants in household sewage. When leaching systems are undersized or overused, or the septic tank is not cleaned often enough, the leaching system becomes clogged and will not accept and disperse the sewage as fast as the household is generating it. This can cause sewage to overflow onto the ground surface or back up into the house.

If you use a kitchen sink grinder/disposal unit, you should only use it sparingly and should have your septic tank cleaned annually. Raw materials introduced through a kitchen disposal have not been "digested" like wastes from the toilet have been, and therefore, they place a significant burden on the organisms in the septic tank. As a result, the septic tank needs more frequent pumping.

Cleaning your septic tank at appropriate frequencies, as recommended above, is the single most important maintenance activity you should perform on your septic system.

You should not put fats or grease, diapers and wipes, cigarettes, coffee grounds or toxic chemicals in your septic system. You should also minimize your water consumption.

WHY YOU SHOULD CARE FOR YOUR SEPTIC SYSTEM

To Save Money

It is much less expensive to properly care for your system than to pay for its replacement when it fails. Cleaning the tank every few years, at a cost of $200- $250, is inexpensive in comparison to $5,000 - $10,000 for the repair or replacement of the leaching system.

Cleaning your septic tank is inexpensive insurance compared to the cost of replacing the system.

Protect Public Health and Prevent Pollution

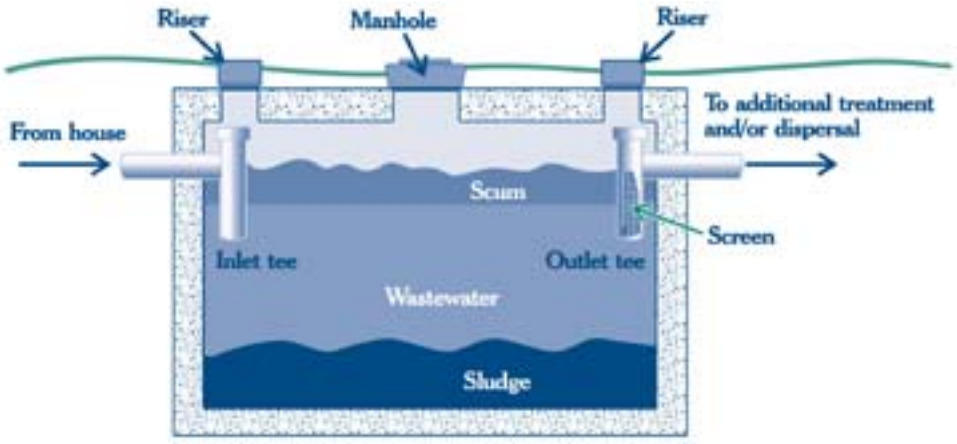
Poorly maintained septic systems fail, causing sewage to come to the ground surface or back up into the home. Dogs, insects and even children may walk through this sewage, and thereby, transmit diseases. Sewage that overflows onto the ground surface pollutes nearby streams. All streams in Madison eventually connect with Long Island Sound, with its beaches and shell fishing waters. A sewage backup into the home is very difficult and expensive to clean up.

To Prevent the Need for Sewers

As mentioned previously, Madison wants to avoid the installation of sewers due to their expense and potential to change the rural character of the Town. If enough septic systems fail in town, the State may force the Town to install costly sewers and sewage treatment plants.

The State DEP carefully oversees Madison's Sewer Avoidance Program to ensure there is no need for sewers.

CLEANING YOUR SEPTIC TANK



(Picture courtesy of US EPA) Cross Section of Septic Tank

As noted above, the septic tank should be **cleaned every 3 to 5 years,** or more frequently if a kitchen sink disposal unit is used. It is important to remember that an empty septic tank will fill with sewage in less than a week in a typical household, and will stay filled until cleaned. (Average household water use is 200-300 gallons per day; average septic tank size is 1,000 gallons). Most of this sewage enters the leaching system and is dispersed in the soil, but a small amount remains in the tank as sludge and scum. **It is the excessive build up of the solids (sludge) and scum (oils and greases) that necessitates cleaning.** The accumulation of the sludge and scum usually takes about 3 to 5 years. Septic tank additives are not needed for the proper operation of the system and often can do more harm than good. **There is no additive that can eliminate the need to clean the tank. There is no substitute for periodic cleaning of the septic tank.** The septic tank cleaning contractor should file a report of the cleaning with the Town and you should keep a record of the cleaning also.

Why Should I Pump the Tank If There is No Problem?

If you experience problems with your septic system, cleaning the septic tank is seldom a long-term solution. Waiting for a problem with the septic system to develop in order to clean the tank is foolish and is akin to changing the oil in your car only when the engine seizes up. Even with the healthiest of septic tanks, there will be residual solids that can be degraded no further. These solids accumulate in the tank and require periodic removal.

DRINKING WATER

Many homes in town are served by the Connecticut Water Company, which is a private water utility regulated by the State Departments of Public Health and Public Utility Control. The remainder of the homes in Madison are served by drinking water wells. Most of these are drilled wells.

Well Details

A drilled well consists of a six-inch hole bored into the underlying ledge rock. The well driller first drills through the overlying soil and then drills a minimum of 100 feet into the rock. A steel, six-inch diameter casing is then pounded into the rock to prevent the soil from caving in and to ensure that no shallow, surface water enters the well. The well is only intended to intercept water carried in cracks in the rock. This casing usually extends about one foot above the ground surface on newer wells. The casing of older wells ends about three to four feet below the surface. This casing is contained in a 2 1 /2 foot diameter concrete well tile, which is buried about two to three feet in the ground. The purpose of this concrete well tile is to act as a manhole, so that the well can be opened, inspected and maintained. This buried well pit can often be located by probing the soil with a metal rod in the area of a small depression or with a metal detector. These buried well pits are often subjected to flooding with groundwater, and can be a recurring source of contamination to the well. **It is highly recommended that this pit be eliminated and the casing be brought above the ground surface.** The well cap on all drilled wells should be of the newer, watertight variety.

Well Pumps and Capacity

Well pumps are generally of two basic types; jet and submersible. Jet pumps were exclusively used until about 20 years ago. They are located in the basement near the hydropneumatic storage tank and have two pipes exiting them. Submersible pumps are located in the well itself, usually about ten to twenty feet up from the bottom of the well. A typical six-inch diameter well contains 1-½ gallons of water for each foot of depth. The yield of a well is a measure of the long-term, sustained amount of water it can deliver without running dry. The <u>average sustained</u> amount of water a household requires is about 1/4 gallon per minute, but instantaneous usage is often much higher than this, i.e. showers and sinks use several gallons per minutes. This, coupled with an adequate reserve of water contained in the well and the hydropneumatic storage tank, is sufficient for <u>reasonable</u> household use.

The Connecticut Well Drilling Code specifies minimum well yields for various total depths of water in completed wells for new wells as follows:

Well Yield Gallons per Minute (G.P.M.)	Depth of Water in Well (Feet)
5	100
3 1/2	150
2	200
1	375
1 /2	450

Water Conservation

Average indoor water consumption in the U.S. is about 65 gallons per person per day. Water conservation can save money, whether the home relies on a well (reduced power consumption by the pump, reduced cost of treatment chemicals) or is connected to public water. Conservation can play an important role in extending the life of your septic system, particularly marginal ones. Reducing the amount of hot water used, i.e. showers, laundry and dishwashing, can have a dramatic impact on the cost of heating this water. Modern toilets use about 1.5 gallons per flush versus older models that require 3.5 to 5 gallons per flush. Placing a plastic bottle full of stones and water or a commercial toilet dam in the toilet tank can reduce the volume used per flush in existing toilets. Dripping or leaking faucets or fixtures can waste several thousand gallons of water a year and should be repaired as soon as possible.

Water Quality

The water quality delivered by a well is as important as the quantity of water a well can deliver. Generally, drilled rock wells deliver water of very good quality. The presence of bacteria is extremely rare in such wells and is a potential cause for concern. Other chemical constituents are found at various concentrations, reflecting background ground water quality. Iron and manganese are very often found in ground water in Madison at concentrations that are aesthetically objectionable. Water softeners utilizing salts are often employed to remove this iron and manganese. It should be noted that this treatment merely exchanges sodium or potassium for the iron, manganese and a number of other constituents in the drinking water entering the home. There are treatment methods that do not add sodium to the drinking water and should be considered by those on sodium-restricted diets. In no case should the backwash from any such treatment system discharge to the septic system, because this can add unnecessary amounts of water to the septic system.

Drilled wells usually provide water of good quality. High iron and manganese are common in Madison wells, however.

The water analysis that is required by the Madison Health Department for approval of new, individual well water supplies provides a general indication of typical ground water constituents in Madison. This analysis is not all-inclusive, however; there are a number of additional analyses that can be performed to detect the presence of more exotic contaminants, such as heavy metals, solvents or fuel components. The parameters included in the typical analysis provide a general indication of drinking water quality from the standpoint of safety and palatability.

It is important to remember that any well water analysis represents the quality of the well water only at the time the sample was collected. No further tests of well water quality are required by the Health Department, once the Certificate of Occupancy is issued for the home, and responsibility for the well is then entirely in the hands of the homeowner. Factors affecting the quality of the ground water in an area can change, and therefore, the potential for changes in the ground water quality also exists. **For these reasons, the Madison Health Department suggests retesting the well water every few years.**

You should retest your well water periodically, especially when you notice a change in its quality.

There are numerous chemical compounds that can be found in water, such as heavy metals, fuel components, industrial solvents, pesticides and radon. With the exception of lead and radon, these other more exotic compounds are rarely found in wells in Madison, because there was, and is, very limited industrial activity in the residential areas of town. Homeowners must be very careful in their use and disposal of chemicals and products that contain toxics. Remember that what you dispose of into your septic system, or spray on your lawn ultimately reaches the ground water, which feeds your well and

nearby streams. Fertilizers, pesticides, herbicides and other home-maintenance products can quickly reach the ground water, and potentially your well. Lead can be leached from interior plumbing, particularly if the well water is acidic, although modern plumbing solder is lead-free. Radon is a naturally occurring gas that may be found in well water in Madison. Radon in well water represents a health risk due to its tendency to leave the water and enter the indoor air as the result of showers, washing machines, dishwashers, etc. It may not be cost-effective or practical to remove radon from drinking water.

You are encouraged to seek the services of a private water-testing laboratory if you desire additional water analyses. The website of the American Ground Water Trust at www.agwt.org contains a great deal of good information on wells and water quality.

Public Water

Public water in Madison is supplied by the Connecticut Water Company (headquartered in Clinton). They are a regulated utility that provides water meeting all Federal and State requirements. You can obtain more information about the quality of water they deliver to their customers by contacting them (at 860-669-6655. **In accordance with State requirements, the Connecticut Water Company adds fluoride to their water, an important additive to reduce dental cavities. Those people that are served by this utility, but drink bottled water are not receiving the beneficial health aspects of this fluoride.**

STORMWATER

Improvements to septic systems, municipal sewage treatment plants and industrial waste treatment over the last twenty years have been dramatic, and have made notable improvements to water quality. Another large source of impairment to the quality of streams, lakes and Long Island Sound is stormwater. Stormwater is the water that runs off impervious surfaces, such as roofs, lawns, streets and parking lots during rainfall. Pollutants that are on these surfaces, such as animal wastes, oils, lawn chemicals, dirt, heavy metals, etc. are washed into catch basins and directly into surface water bodies. Polluted stormwater is often as large a source of contamination to these surface waters as the effluent from sewage treatment plants. **Long Island Sound is significantly impacted by the storm water that runs off the lawns, streets, parking lots, etc. that serve the millions of people living within 30 miles of the Sound, and we all must play a role in reducing this impact through individual action.**

There are several actions that individual homeowners can take to reduce their contribution of pollutants to Madison's stormwater.

- **Don't litter**; cigarette butts, cans, paper, other debris can wash directly into the Sound and represents an aesthetic problem and can harm marine life.
- **Use lawn and garden fertilizers wisely**, apply the minimum you need; avoid applying fertilizers within 25 feet of a stream or other water body or on impervious surfaces (driveways, sidewalks) where it will wash directly into a storm drain or water body, most turf grasses only need 2-3 applications of fertilizer per year, additional applications only overload the ground and surface waters with nitrogen; mulching the grass clippings and leaving them on the lawn supplies about 1/3 of the lawn's annual nitrogen needs.
- **Use lawn and garden pesticides and herbicides wisely**, apply the minimum you need; use the appropriate chemical for the targeted species, rather than a broad-spectrum chemical; follow the label instructions carefully; avoid applying such chemicals within 25 feet of a stream or other water body or on impervious surfaces (driveways, sidewalks) where it will wash directly into a storm drain or water body, use principles of Integrated Pest Management.

- **Check automobiles and other equipment for fluid leaks and repair promptly**; gasoline, oils, antifreeze, etc. can be directly washed into water bodies and storm drains.
- **Wash your car on the grass, if possible**; this allows soapy and dirty water to infiltrate the soil and not run into storm drains and water bodies.
- **Don't dump wastes into your sump pump if connected to a storm drain**; some homes have their sump pumps and/or footing/foundation drains connected to storm drains and this can be a direct source of contamination to streams and Long Island Sound.
- **Don't dump anything into storm drains or your yard**; all storm drains in Madison empty directly into Long Island Sound, or the nearest stream or wetland, and then into the Sound, household hazardous wastes can be brought to Household Hazwaste Central in New Haven on Saturday mornings from May to October (there is often a satellite collection in October in Madison for added convenience).
- **Don't rake leaves or shoot grass clippings into storm drains**; these materials add a great deal of organic contamination to streams and Long Island Sound.
- **Collect and properly dispose of pet waste**; animal waste can be a significant source of nutrients and bacteria to streams and Long Island Sound; beaches and the bathing water can become contaminated with bacteria from pets and can cause illness.
- **Maintain undisturbed, vegetated strips at the edge of streams, wetlands and Long Island Sound**; 25 feet or more of vegetation allows runoff to infiltrate into the ground where it can be filtered, cooled and cleaned before it enters the ground water and/or stream water, a buffer strip can effectively remove sediment traveling overland with the runoff and prevents erosion of the banks.
- **Minimize the amount of impervious surfaces on your land**; impervious surfaces reduce the area of soil into which rainfall can infiltrate, thus increasing the volume of runoff that flows over the land.
- **Report any unusual discharges to the Public Works or Health Department**.

If you would like further information on septic systems, water testing or possible treatment, feel free to contact the Madison Health Department at 245-5681.

You may wish to keep notes as to the location of your septic tank and other details of your septic system and well construction in addition to any maintenance activities of these utilities in the space provided below. **Please pass this information on to the next occupant of your home**.

Sketch location of septic tank, leaching system and well:

Septic Tank Pumping Record

Date	Company Name
