Grindstone Lake
Septic Sewer Survey Results
Summer 2007

Grindstone Lake
Town of Bass Lake
Sawyer County, Wisconsin

Sawyer County Sanitarian, Mert "Mac" Maki
&
Summer Intern, Alan Craig

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Acknowledgements

First and foremost, I would like to thank Mert “Mac” Maki, Sawyer County Sanitarian and Soil Morphologist, for his patience, good humor, often improbable memory, and teaching ability.

The staff at the Sawyer County Zoning Office has been very helpful as well, and is a committed and conscientious group of individuals.

The homeowners on Grindstone Lake were overwhelmingly kind, supportive, and genuinely interested in the survey and the health of the lake. Without their support and cooperation the septic survey could not have occurred.

Past and present members of the Grindstone Lake Association Board of Directors, including, Bruce Miller, Tom Gleason, Ray Moeller, Linn Newton, Marilyn Lundberg, Bruce Paulsen, Camille Venners, and others, deserve special thanks for their commitment to this project, and to the water quality of Grindstone Lake.

Thank you also to Mike Gardner at the Sigurd Olson Environmental Institute at Northland College for encouraging me to accept a position completely beyond my realm of experience.

Many Thanks,

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2007 Sawyer County Zoning and Sanitation Summer Intern

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General Outline of the Lake Septic Sewer Survey ~ Sawyer County

1. The County gets the lakeshore owners approval list.

2. The lake association will be placed on the waiting list. Depending on funding and the availability of college interns, it may be 1-3 years before the survey is conducted.

3. The Zoning Committee procures money from the County Board to fund the project. If the County Board only approves partial funding, the lake association must pay the balance, or get a grant from other resources.

4. If funding is approved, the Zoning Office will notify Northland College in Ashland, or UW-Stevens Point for a summer intern student.

5. The County and the college will sign a contract agreement to hire a college intern for a period of 12 weeks. The survey is conducted from approximately June 1 through September 1.

6. The student intern will be supervised by the County Sanitarian/Soil Morphologist.

7. The intern will research all previous sanitary permits and soil tests that have been conducted on each lakeshore property.

8. The student intern will be supervised and field trained by the County Sanitarian Mert Maki, WI License #224901.

9. The County Sanitarian and intern will inspect each existing septic sewer around the lake. Hands-on field training will be conducted for 3-4 weeks. Once the County staff feels confident that the intern has all the required knowledge of inspection procedures, the intern will conduct the inspections on their own.

10. The field inspection starts with an informal interview with the homeowner (if present). The intern will ask the homeowner to respond to a few questions about the sewer, any sewer problems, bad odors, sewage on the ground, pumping cycle, year round or seasonal usage, garbage disposal, etc.

11. The inspector will locate the sewer system and draw a layout or plot plan showing the location of the home, outbuildings, septic tank, sewer system, well and location of the lakeshore. Measurements will be taken from the home to septic tank, home to septic vent, distance to well and distance to the lake.

12. The inspector will set up a contractor's transit to measure the field elevations of the ground by the sewer, the bottom of the sewer and record the Ordinary High Water Mark (OHWM) of the lake. Measuring the vertical difference from the bottom of the sewer system (system elevation) to the OHWM may give an indication that the sewer is not code compliant. State code requires 36" vertical separation from the bottom of the sewer to a restrictive factor. A restrictive factor may be soil mottling, saturated soils, ground water, and/or bedrock.

13. If in an area of potential high ground water and poor soils, a 3" diameter soil auger will be used to bore a hole adjacent to the sewer. The inspector will bore a hole to a depth of 3' below the system elevation. The inspector will record any restrictive factors present to see whether the system meets state code.

14. The survey does not include septic tank inspections. We do not have the time, staff, nor funds to inspect septic tanks. However, if a lakeshore owner wants to contact a septic tank pumper, we are more than glad to be on-site for pumping and inspection of the septic tank. A word of caution on old steel septic tanks: It is our experience that steel septic tanks start rusting out at about 15 years old. Old tanks will pinhole out and the steel baffles deteriorate and/or fall off.

15. If a failed sewer is noted, the County Sanitarian/Soil Morphologist will visit the site with the intern to confirm the failure. The County will issue an "Order for Correction" to the homeowner. The homeowner will have one (1) year to replace the failed system. If we encounter a severe failure, sewage on the ground, sewage close to the lakeshore, or sewage causing a general health hazard, we can issue a 30-60 day order.

16. If our observations indicate a failed system, the homeowner has the right to have a private sewage inspector inspect the system at their own expense. The private licensed qualified inspector (Master plumber, soil tester, POWTS inspector) will charge approximately $150-$300 to conduct a thorough test.

17. After all the field work is completed, the intern will tabulate all the passing and failing sewers. The intern will also write a written report of the sewer survey prior to the completion of the 12 week project.

18. The lake association will receive copies of the written report.

19. The County Sanitarian will continue to do all the follow-up until the project is complete. This may take 1-2 years for final completion.

20. If the homeowner does not replace the failed sewer, the county will issue a "Second Order for Correction". If the homeowner does not comply after the second notification, the County will issue a citation for failure to replace the failing system.

21. Sawyer County administers the Wisconsin Private Sewage Grant fund. Resident homeowners that qualify may be eligible for this grant that can pay for approximately 50% of the sewer replacement costs.

22. The Lake Septic Sewer Surveys are very worthwhile projects in our Northwood's lake setting. It requires a lot of cooperation from the lake association, a dedicated staff at the Zoning office and an energetic college intern to complete the project. The ultimate goal is to check for failed septic sewer systems on or near our lakeshores. Properly functioning, code complying sewer systems will cleanse the sewage for proper re-entry into the ecosystem. It is very important to protect our environment, the groundwater we drink, and the lake waters that provide us with beauty, serenity, and recreation. "We all must be stewards of the land".

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Lake Septic Sewer Survey

Lake Association Responsibilities

1. Lake association must petition all lakeshore property owners for approval of the septic survey.
2. Must get 51% of the lakeshore owner's approval. It is best to get at least 60% approval. The higher percentage of approval the less negative attitude there is towards the sewer inspectors.
3. For those lakeshore owners that did not respond it is best to send a second notice letter.
4. Submit the approval list to the Sawyer County Sanitarian.
5. The lake association's name will be placed on the lakes priority waiting list. Depending on funding and the availability of college interns, the project may not be conducted for 1-3 years.
6. The County has funded the lake survey in the past. The County has paid for intern's salary, mileage and office supplies. Due to future tighter budgets, the Zoning Committee and the County Board may request cost sharing with the Lake Association.

Grindstone Lake ~ General Information

Grindstone Lake is drainage, glacial lake, with 3,111 surface acres, a maximum depth of 60 feet, and a mean depth of 30 feet. It is located in sections: 13, 17, 18, 20, 23, 25, 26, 29, and 30 of township 40 north, Range eight west, in the Town of Bass Lake. The Grindstone lake area is located approximately nine miles south of Hayward, Wisconsin. A small navigable channel connects Grindstone and Little Grindstone Lake.

Several fish species are present in Grindstone Lake, including: Muskellunge, Northern Pike, Large Mouth Bass, Small Mouth Bass, Walleye, and assorted pan fish. Grindstone has been designated a Class A Musky lake by the Wisconsin Department of Natural Resources.

There are two public boat access's on the south west and south east shores of Grindstone Lake, and 305 seasonal and year round dwellings, including three resorts.

The Grindstone Lake area is an example of the fine natural resources residents and visitors to Sawyer County appreciate and enjoy. It is our responsibility to use the land and water in an acceptable manner and to protect our valuable resources. By conducting the septic sewer survey on the properties surrounding Grindstone Lake, we are taking an active role in this protection. The cooperation of the property owners with the help of the lake association has helped the greater lake community for years to come.

Purpose

The Grindstone Lake Association is interested in maintaining the groundwater and lake water quality and clarity of Grindstone Lake. Lake water quality is degraded by many factors including, but not limited to: agricultural runoff, lawn fertilizers, pesticides, herbicides, soil erosion and sedimentation runoff, and failing septic systems. The Grindstone Lake Association would like to ensure that all septic sewer systems are in code compliance with the Sawyer County Sanitation Ordinance and Department of Commerce Chapter 83 (Private Sewage Code).

Introduction

The National Small Flows Clearinghouse's (NSFC) pamphlet titled, "So…Now You Own a Septic System," (1993) stated that more than 25 million homes, almost 25 percent of the U.S. population, dispose of domestic wastewater through onsite sewer systems. Another handout released by the Wisconsin Division of Safety and Building, titled, "Is the Grass Greener Over Your Septic System?" (1998) stated that approximately 700,000 of the private onsite wastewater treatment systems (POWTS) are in Wisconsin alone. Maintaining POWTS properly helps protect the health of your family, your community, and the environment. This is because household wastewater may contain bacteria, viruses, household chemicals, and nutrients such as nitrogen and phosphorus. A failed septic system can contribute to the pollution of the groundwater, the local rivers and lakes, and the shorelines that are used for commercial and recreational activities by the community.

Soil treats the wastewater effluent by acting as a filter, trapping the viruses, bacteria, and nutrients in its pores or on the soil pedons themselves. Some of the chemical constituents are absorbed and used by plants, while the remainder moves through the soil. There are only certain types of soil that can purify sewage effluent. If the soil pores are too large or too small, the wastewater effluent will either percolate too rapidly or too slowly. Insufficiently treated effluent can cause groundwater contamination and health hazards will arise if people or animals contact the effluent.

Department of Commerce Chapter 83, Wisconsin Administrative Code, defines what is needed for a soil and site to be suitable for a POWTS. Some of these requirements include: 1) A three-foot separation between the bottom of the soil absorption system and groundwater, seasonal high groundwater, or bedrock. A two-foot separation is allowed on POWTS installed prior to December 1, 1969; 2) Soil conditions not well suited for the treatment and disposal of wastewater; 3) Slopes greater than 25 percent are not suited for POWTS. Following the codes made by the Department of Commerce will help in preventing further groundwater contamination and will help protect the public health and welfare of all.

Prior to installing a sewer system, the state requires a licensed soil tester to conduct a soil test to check the suitability of soils for a sewer system. Old soil tests used to be referred to as "PERT" or "PERC" tests. PERC stands for percolation tests and these were antiquated and somewhat unreliable. The soil horizons were not taken into consideration. The State of Wisconsin changed from the old "PERC" tests to soil morphology testing on July 1, 1994. Soil morphology testing is much more detailed and more accurately describes the soil texture, soil horizons, soil structure, soil consistency, and soil mottles for the suitability of septic systems.

Types of Private Onsite Wastewater Treatment Systems (POWTS)

POWTS technology has advanced through the years and so has the treatment of domestic household waste. Some of the types of systems currently being installed under the regulations of the Department of Commerce include privies, holding tanks, conventional gravity systems, conventional lift systems, in-ground pressure distribution systems and mounds.

There are two basic types of privies. One is an open pit privy, which simply is a hole dug in the ground under a privy. An open pit privy requires a soil boring to prove that soils are suitable for waste. The second type of privy is a sealed vault privy. A sealed vault privy requires a minimum storage capacity of a 200 gallon watertight container to hold all waste and must be pumped by a licensed waste hauler when full.

Other types of privies also include portable restroom units and a variety of different composting and incinerating toilets. Privies are for minimal and occasional usage and can be installed when a dwelling does not have pressurized water. If a dwelling has pressurized water, a code complying POWTS system must be installed.

A holding tank is another type of system. A holding tank is a watertight receptacle for the collection and holding of wastewater. The minimum size holding tank for up to a 3 bedroom house is a 2000 gallon capacity tank. When the tank is full, a waste hauler must be contacted to pump and dispose of the effluent either by land-spreading or at a municipal wastewater treatment plant. When soils and/or topography become limiting factors, a holding tank may be the only viable system.

Except for privies and holding tanks, all other systems include an important component called a septic tank. A septic tank is a water treatment device defined by the Department of Commerce as a device which renders inactive or removes microbiological, particulate, inorganic or radioactive contaminates from water which passes through the device or the water supply system downstream of the device.

Downstream of the septic tank is another component of a POWTS, the Soil Absorption System (SAS) or also called a cell. Cells can not be wider than 6 feet. Most cells are designed to be long and narrow, to utilize a larger soil area for treatment, including the native soil of the sidewalls of each cell. There are several different types of media used for SAS. Some examples are washed and screened rock, washed and screened sand, gravel-less leeching chamber units and other artificial media.

The most common POWTS is a conventional gravity flow system. This system includes a septic tank and a SAS. The SAS is located at a lower elevation than the outlet of the septic tank and the effluent flows via gravity to the cell(s).

A conventional lift system is similar to that of the gravity flow system, but the cells are located at an elevation above the outlet of the septic tank. A separate chamber is required to house a pump to dose the effluent to a high point and then the effluent flows to the cell(s) via gravity. This chamber can be in combination with the septic tank or a separate pump tank.

An in-ground pressure distribution system is also a lift system that utilizes the shallowest natural soil possible which is 36 inches. It includes a septic tank, a pump chamber or pump tank, and a pressurized dosed cell.

If 36 inches of natural suitable soil are not available, washed and screened sand is needed to construct a mound. Mounds require a large area and a level site. A mound system also includes a septic tank, pump chamber or pump tank, and a pressurized dosed cell.

Some types of SAS, still present and in use today, once considered acceptable, but are no longer being installed due to state code changes include drywells, cesspools and conventional septic beds.

Drywells, also called seepage pits, were once commonly installed as a way of treating effluent leaving the septic tank. Drywells were constructed out of concrete blocks, bricks, fieldstones, or rocks and composed in a 4 – 6 foot diameter cylindrical shape and up to 8 feet in depth. Most were installed 5 – 15 feet in the ground. Because of this deep construction technique, not only was it dangerous to install drywells, but many were installed in or slightly above ground water resulting in untreated effluent entering the ground water. If a drywell was installed in groundwater, the system would very seldom fail or back up into a house, because the groundwater would flush the system out. The untreated effluent would then travel through the ground water to the water we drink and to surface waters of lakes, rivers and streams. Present code requires a minimum separation distance of 36" between the bottom of the infiltrative surface of a system and a limiting factor such as groundwater.

Cesspools are defined by Department of Commerce Chapter 81 as an excavation which receives domestic wastewater by means of a drain system without pretreatment of the wastewater and retains the organic matter and solids permitting the liquids to seep from the excavation. Some cesspools were constructed in such a manner that they did not have a cover and were exposed to the ground surface. This type of system does not utilize a septic tank and poses a serious health threat. The use of a cesspool as a POWTS is prohibited, including any cesspool existing prior to July 1, 2000.

Conventional septic beds are cells that are wider than six feet. Beds were allowed to be installed prior to July 1, 2000. Most septic beds were 12 feet wide and were composed of rock aggregate and perforated pipe.

The life span of a particular POWTS depends on water usage, household habits and other criteria. One way to improve effluent quality is to install an Aerobic Treatment Unit (ATU). An ATU introduces oxygen into the treatment tank to improve effluent quality before entering the SAS. An ATU can be installed to rejuvenate a failing SAS, and can also allow for downsizing of the installation of a new SAS, if area or soils are a limiting factor. An ATU is also required to be installed in eating establishments and other commercial businesses which have high strength waste.

As technology continues to improve, new types of private onsite wastewater treatment components and systems will better protect public health and the waters of the state.

The Lake Survey

The Sawyer County Zoning and Sanitation Office, with cooperation from area lake associations, has been conducting septic sewer surveys for approximately 30 years. The most recent lake surveys include: Spider Lake 1991-1992, Teal & Ghost Lake 1993, Lac Court Oreilles 1994, Lost Land Lake & Blueberry Lake 1995, Big and Little Round Lake 1998-1999, Tiger Cat Flowage 2001-2002, and Windigo Lake in 2006.

Sawyer County does not conduct septic sewer surveys every year. It depends on whether a lake association is ready for the survey, as well as if the County Board has approved funds for lake surveys.

The lake association must initiate the lake survey. In 2002**,** the Grindstone Lake Association contacted the Zoning Office to inquire about a future lake survey. Between 2003 and 2006 the association mailed petitions and permission slips to the lakeshore owners to conduct the survey. By the year 2006, the Grindstone Lake Association had 68%-70% of the lakeshore property owner's approval. The lake association contacted the Zoning Office to have its name put on the lake survey priority list.

The survey was started in October of 2006, and continued in June 2007. Prior to starting the actual field work, the student intern researched the property information from the county tax files. If sanitary permits and soil tests were on file after 1971, copies were made for reference while doing the field work. After all the research was completed, the actual field work was started. An arbitrary starting point was chosen and the survey continued around the lake.

The field work was conducted by the County Sanitarian/Soil Morphologist and the summer student intern. All of the 286 systems were inspected in approximately eight weeks.

Field Inspection Techniques

The County Sanitarian and Summer Intern research department permits and make copies of any/all previous sanitary permits and soil tests for properties involved in the septic survey. This information is used on each onsite property inspection. The previous sewer inspection sheet and plot plan are used to locate the sewer system. Setback measurements are taken from the home, septic tank, septic system, well, and the lake and are verified with previous inspection reports.

Upon arriving at each property, the inspectors introduce themselves if the homeowner is present, and explain the purpose of the visit involving the lake survey. Questions such as if the owner's usage is year round or seasonal, the number of household members, the number of bedrooms, age of the system, the type of system, and if they pump on the required 3 year cycle are asked. If the homeowner is not present, the field work is conducted and an informational sheet is left on the door as to the time and date of the inspection, results, and additional comments.

The inspection proceeds by locating the system vent (if present), and removing the inspection/vent cap. The inspector drops a small rock into the vent to check for ponding water. If the system is dry, in most cases the system passes. If there is any suspicion of the system elevation and a high groundwater situation, the system is investigated in more detail. If water is present, the depth, time and date are recorded. Water ponding in the system may indicate an older mature system that has developed a clogging mat. If a clogging mat is present, sewage water cannot move down through the native soil, causing water to build up in the system. If there is a large amount of water (5-10 inches) and a thick black tar-like clogging mat is present, the system is aging and may be near failure. If ponding sewage water is found on the ground, around the system or around the vent, it is a failed system.

If an unusual amount of water is found ponded in a newer system, the inspectors will question the homeowner about daily usage. For example, the family household may have recently taken many showers/ baths or laundry, which would result in a large amount of household water discharge, thus causing the ponding. In this example, we may discover that the ponding is a false indicator of failure. Another false indicator of ponding may be our inspection taking place after several days of heavy rainfall, resulting in ponding.

Another method of inspection involves taking elevations of the sewer system, and comparing the elevation to the Ordinary High Water Mark (OHWM) of the lake. A surveyor's transit is set up to calculate the ground elevation by the system, at or near the bottom of the system and at the OHWM.

The State of Wisconsin private sewage code, Department of Commerce Chapter 83, requires at least 36 inches of suitable unrestricted soil under all systems. Having 36 inches of natural or native soils will treat the sewage effluent enough to re-enter the groundwater.

While calculating the difference between the system elevation to the ordinary high water mark there needs to be 36 inches of separation. If the differential is greater than 36 inches, that is good. If the separation distance is around 36 inches or less, other testing methods are used to verify passing or failing the system. If the bottom of the system elevation is at the lake elevation or below, it is in most cases a failure and requires more field work using a soil auger boring.

The final method of inspection involves a soil auger boring adjacent to the system. A 3 inch diameter hand soil auger is used to bore a hole to a depth of 36 inches below the system and record the soil restrictions if present. Any soil restrictions are noted, such as soil mottles, saturated soils, groundwater and/or bedrock. If soil restrictions are within 36 inches below the system, the system fails and must be replaced by a code complying system.

Failed Systems

When the inspectors encounter a failed system, they will record all information and state the reasons for failure. Causes of failure may be a variety of reasons such as: ponding sewage on the ground, a collapsed septic tank or drywell, sewage water flowing towards the lake or a well, sewer system located in groundwater, or a sewer system that does not have 36" of suitable soils below the system.

If the homeowner is present, the inspectors will discuss the reasons for failure with them. The Zoning Office will send the owner an "Order for Correction" to replace the failing sewer system. State Code requires the owner to replace the system with a code complying system within one (1) year of the date of failure.

Should the homeowner disagree with the determination of failure, they have the right to hire a licensed person to dispute the findings. A qualified licensed person will be a master plumber, master plumber restricted, a POWTS inspector and/or a certified soil morphologist.

If the homeowner does not replace the failing sewer system within the one year deadline, the Zoning Office can issue a non-compliance citation. Currently, the citation fee for non-compliance is $753.00.

Definition of Failure

When homeowners are asked how their sewer system is working, common responses vary: "the system is working fine", "we've never experienced a back-up or sewage on the ground", or "we've never had a failure".

County Sanitarians rely on the State of Wisconsin Department of Commerce's definition of failure, Chapter 81.01 (92):

"Failing private onsite wastewater treatment system" has the meaning specified under s. 145.245 (4), Stats.

Note: Section 145.245 (4) reads:

"Failing private sewage system" means a private sewage system which causes or results in any of the following conditions:
The discharge of sewage into surface water or groundwater.
The introduction of sewage into zones of saturation which adversely affects the operation of a private sewage system.
The discharge of sewage to a drain tile or into zones of bedrock.
The discharge of sewage to the surface of the ground.
The failure to accept sewage discharges and backup of sewage into the structure served by the private sewage system.

Wisconsin Fund Grant Program

The Wisconsin Fund Grant Program, established in 1978, is a program that provides financial assistance to property owners with a failing septic system to help protect the public health, safety, and the waters of the state. Most counties in Wisconsin, including Sawyer County, participate in this program. Not every property owner in the county is eligible to receive the grant and filling out the application does not guarantee the homeowner will receive assistance. There are a number of requirements that must be met.

1) Your permanent residence must be in the state participating in the program and must be occupied by the owner 51% of the year.

2) Your system must be considered failing by code.

3) The private sewage system serving your principal residence or small commercial establishment was constructed prior to July 1, 1978.

4) Family income of all owners of the primary residence is less than $45,000 or the gross revenue of the small commercial establishment is less than $362,500.

Failing septic systems are divided into three categories:

Category 1 failures are those that fail by discharging sewage to the surface water, groundwater, bedrock, or into zones of seasonally saturated soils. These are considered the highest priority, and currently this is the only category being funded by the state.

Category 2 systems are those that fail by discharging sewage to the surface of the ground.

Category 3 failures are those that fail by causing the backup of sewage into the residency or business served.

The State of Wisconsin has budgeted approximately $2.9 million dollars annually for the grant program. The homeowners grant is approximately 50% of the system cost, and not to exceed 60% of the total system cost. The maximum grant for a small commercial business is $7,000. Monies received through the Wisconsin Fund Grant are a reimbursement to the homeowner. It can take up to a year to receive a reimbursement check.

Summer 2007 Inspection Results

1. Pass/Fail (See Graph 1)

We inspected 286 systems for 305 dwellings. Some dwellings (especially condominiums) shared common septic systems. Of the 286 systems inspected, 243 (85%) passed inspection, 30 systems (11%) failed inspection, and nine systems (3%) were inconclusive. Four properties could not be inspected because the homeowner denied the inspectors access to their property.

Of the thirty failing systems, 16 (53%) were old drywells, 9 (30%) were conventional bed systems, Three (10%) were cesspools, and two were classified as other. We identified four parcels on the Lac Court Orilles Reservation that we have no jurisdiction for inspection.

2. System Type (See Graph 2)

Of the total systems inspected, 125 (44%) were bed designs, and 39 (14%) were of the trench/cell variety. 51 (18%) drywells were inspected, with 35 of those drywells passing inspection, generally due to elevation, and no visible signs of failure such as effluent on the ground or a collapsed tank. These drywells were installed 30-50 years ago, and are most probably undersized by today's standards. There were 17 (6%) mound systems and 38 (13%) holding tanks located in low lying areas with soils inadequate for conventional systems. We identified three systems as cesspools, which are illegal by code, and failed. 13 (5%) systems were of inconclusive type, including four which we were unable to inspect due to the homeowners denial of permission to inspect.

3. Age of systems (See Graph 3)

We encountered nine (3%) systems of uncertain age, but which were likely constructed before 1970. A total of 74 (26%) systems were constructed before 1970. A majority of these older systems are of the "drywell type" which were installed 30-50 years ago, are now obsolete, and no longer in the private sewer code.

14 septic systems (5%) were inspected that were constructed between 1971 and 1979, the majority of which were of the conventional bed type. While we do not have the time or resources to inspect septic tanks during the course of the survey, it should be noted that it is probable that many of the steel tanks installed before 1980 are rusted and failing. In instances where such failure was suspected, we recommended that the homeowner have the tank inspected by a licensed septic pumper, or POWTS inspector/maintainer.

4. Reasons for Failure (See Graph 4)

A total of 30 systems failed inspection. Of those, 16 (53%) were drywells in the groundwater. Nine systems (30%) were conventional bed systems which failed to meet code based upon there proximity to soil restrictions, and/or groundwater. Three systems (7%) were cesspools, which are illegal by code. Two additional systems failed, one being a drain field constructed with perforated pipe, and the other an old drywell for an unoccupied building which had not been properly abandoned, and posed safety and liability concerns.

Many homeowners were surprised to learn that their septic systems were failing, because they had "never had a problem with them." Unfortunately, though superficially functioning, these failing systems are/were not purifying the sewage before reaching groundwater.

Failed Systems – Reasons for Failure

1. Anderson, John, Joyce 14850W Valhalla Drive
   Old drywell in ground water.

2. Berry, Karren 14828W Valhalla Drive
   Bed system, restrictive factors in soil.

3. Buman, John 8617N Yopps Road
   Old drywell in ground water.

4. Christensen, Carl 7772N Oakwood Drive
   Open pit: dwelling to be demolished.
   *Pit filled in 08-28-07

5. Clipper, Gary 8571N Shady Lane
   Inadequate separation between soil restrictions and bottom of bed system.
   .

6. Cooper, Darren 8121N County Highway K
   Old drywell in groundwater.

7. Fischer, Robin 8677 Brossard Road
   Septic tank functioning as cesspool.

8. Fisher, Joanne 8129N County Highway K
   Perforated pipes; inadequate separation/soil restrictions.

9. Gerry, Tim 14183W County Road E
   Old drywell in groundwater.

10. Gertz, Thomas 8388N West Shore Lane
    Bed system; not to code.

11. Giese, Glenn 14109W County Road E
    Old drywell in groundwater.

12. Graham, Linda 14162W Poplar Ave.
Common system with Mumford. Inadequate separation between bottom of drywell and groundwater.

13. Klapperick, Karren 15037W Beckwith Road
Bed system buried by driveway.

14. Lerner/Lesyinski 14060W Poplar Ave.
Conventional bed, inadequate separation.

15. Lone, Richard 8683N Brossard Road
Drywell in groundwater.

16. Maxon, Jeffery 14080W Poplar Ave.
Cesspool in groundwater.

17. Meeker, Dr. Hal 14183W County Road E
Old drywell in groundwater.
*New holding tank installed 07-18-07

18. Morse, Joan 14117 County Road E
Old drywell in groundwater.

19. Mumford, Earl 14156W Poplar Ave.
See Graham.

20. Neuman, William 8599N Shady Lane
Old drywell in groundwater.

21. Rhine, William/John/David 14698W County Highway K
Cesspool in groundwater.

22. Rogers, William 14973W Cherokee Trail
Old drywell in groundwater.

23. Skelley, Lee 8157N County Highway K
Old drywell in groundwater

24. Steigauf, Warren 14034W Poplar Lane
Old drywell in groundwater

25. Stein, Gunter 8641N Yopps Road
Old drywell in groundwater

26. Strong, Doyle 7786N Rolly's Lane
Bed System; inadequate separation.

27. Wendel, Bradley 14602W County Highway K
Bed system; discharge of sewage on surface of ground.

28. Wernlund, Brent 8635N Yopps Road
Old drywell in groundwater.

29. Wiesensel, Barbara 8315N Blackberry Lane
Old drywell in groundwater.

30. Wippler, Rick 8125N County Highway K
Bed at low elevation.
*Soil test in July 2007

31. Zoeger, Shirley 8585N Shady Lane
Old drywell in groundwater.

Inconclusive Results

1. Brossard, Howard 8689N Brossard Road
Drywell; bottom approximately six feet above the lake.

2. Chwistek, John 14324W Poplar Lane
Locked gate, no trespass signs. System prior to 1970.

3. Johnson, Gary 14150W Poplar Lane
Old drywell no more than three feet above high water. Neighboring drywell at slightly higher elevation failed. Posted; could not inspect.

4. Schnitzler, David 14084W Poplar Avenue
We could not determine system type.

5. Schofield, Thomas 8719N Nor Wis Road
Unknown system type.

6-8. Slyman, Clyde 14009W Sunset Ridge Road
Three dwellings; could not locate systems. Two dwellings appear to be using a privy.

9. Swenson, Linda 8419N Williams Resort Road
Plus 30 feet above the lake; could not locate system.

Owner Did Not Allow Inspection:

1. Bauer, Dave 14254W Poplar Lane

2. Chevrier, James 7902W Stone Bay Lane

3. Nelson, Gary 15094W Gross point Drive

4. Welch, Robert 14214W Omajik Road

Total Systems Inspected

Status	Number of systems	Percentage
Pass	243	85%
Fail	30	11%
Inconclusive	9	3%
Owner refused inspection	4	1%
TOTAL	**286**	**100%**

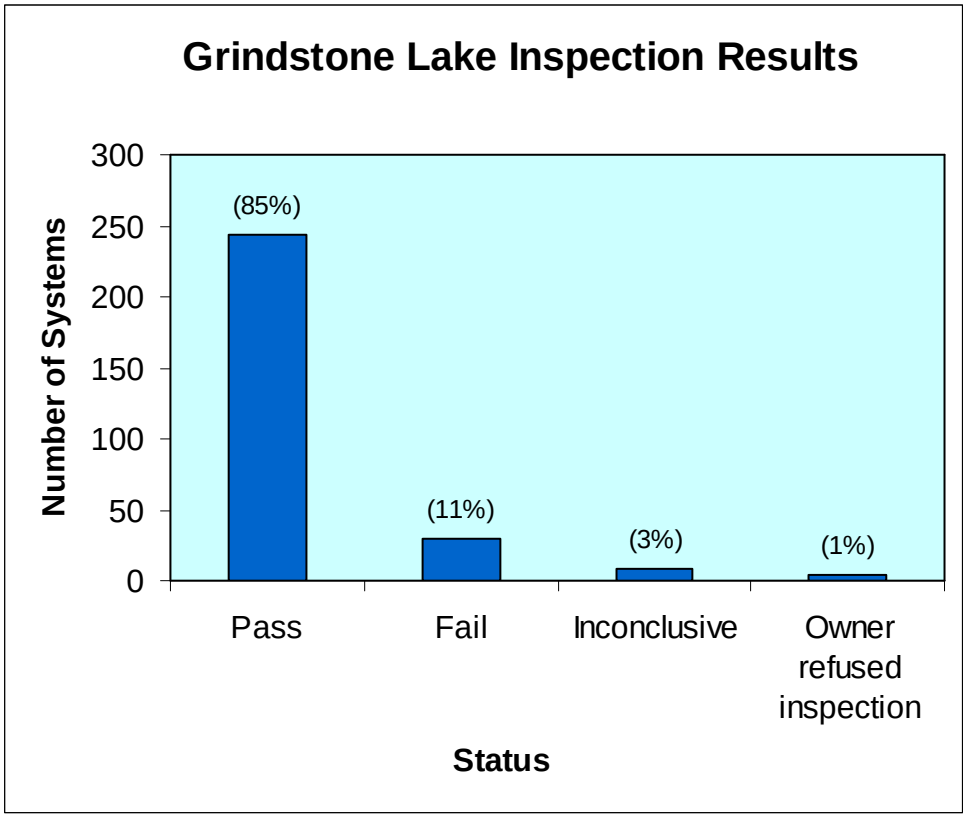
Age of All Systems

Year Range	Number of Systems	Percentage
Unknown Age	9	3%
Prior to 1970	74	26%
1971 to 1979	15	6%
1980 to 1989	64	21%
1990 to 2007	124	46%
TOTAL	**286**	**100%**

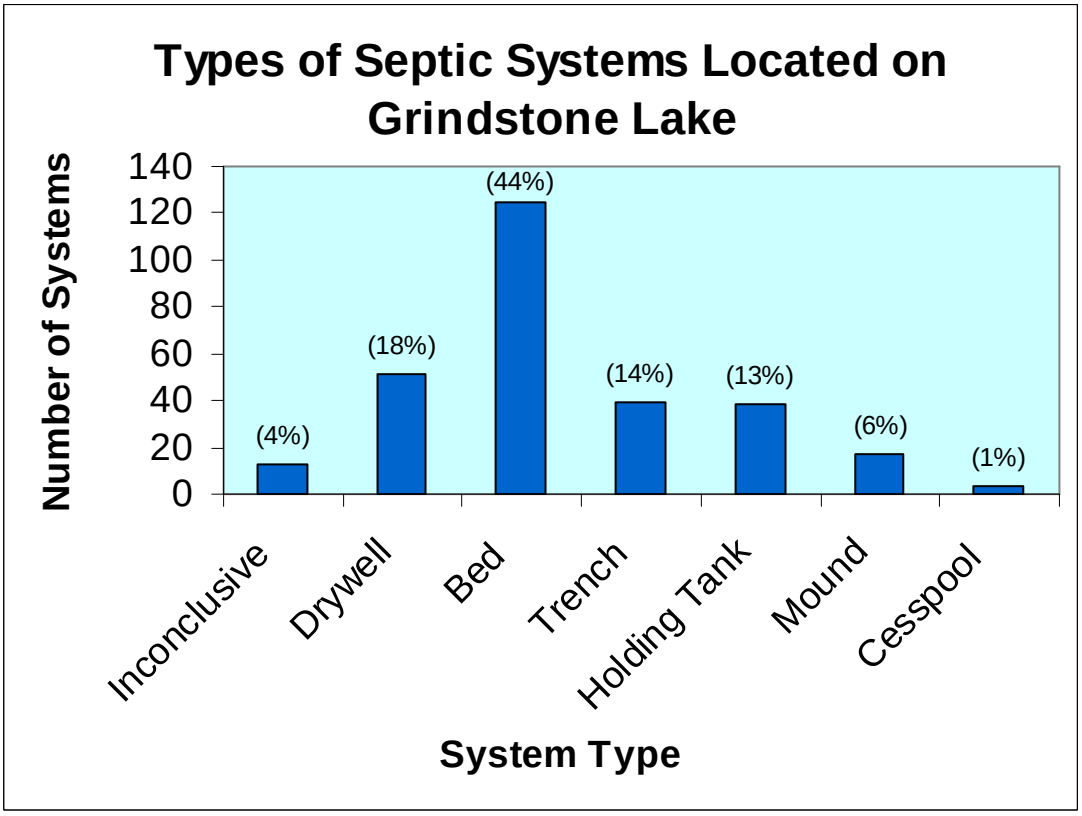
Types of Systems

System Type	Number of Systems	Percentage
Inconclusive	13	4%
Drywell	51	18%
Bed	125	44%
Trench	39	14%
Holding Tank	38	13%
Mound	17	6%
Cesspool	3	1%
TOTAL	**286**	**100%**

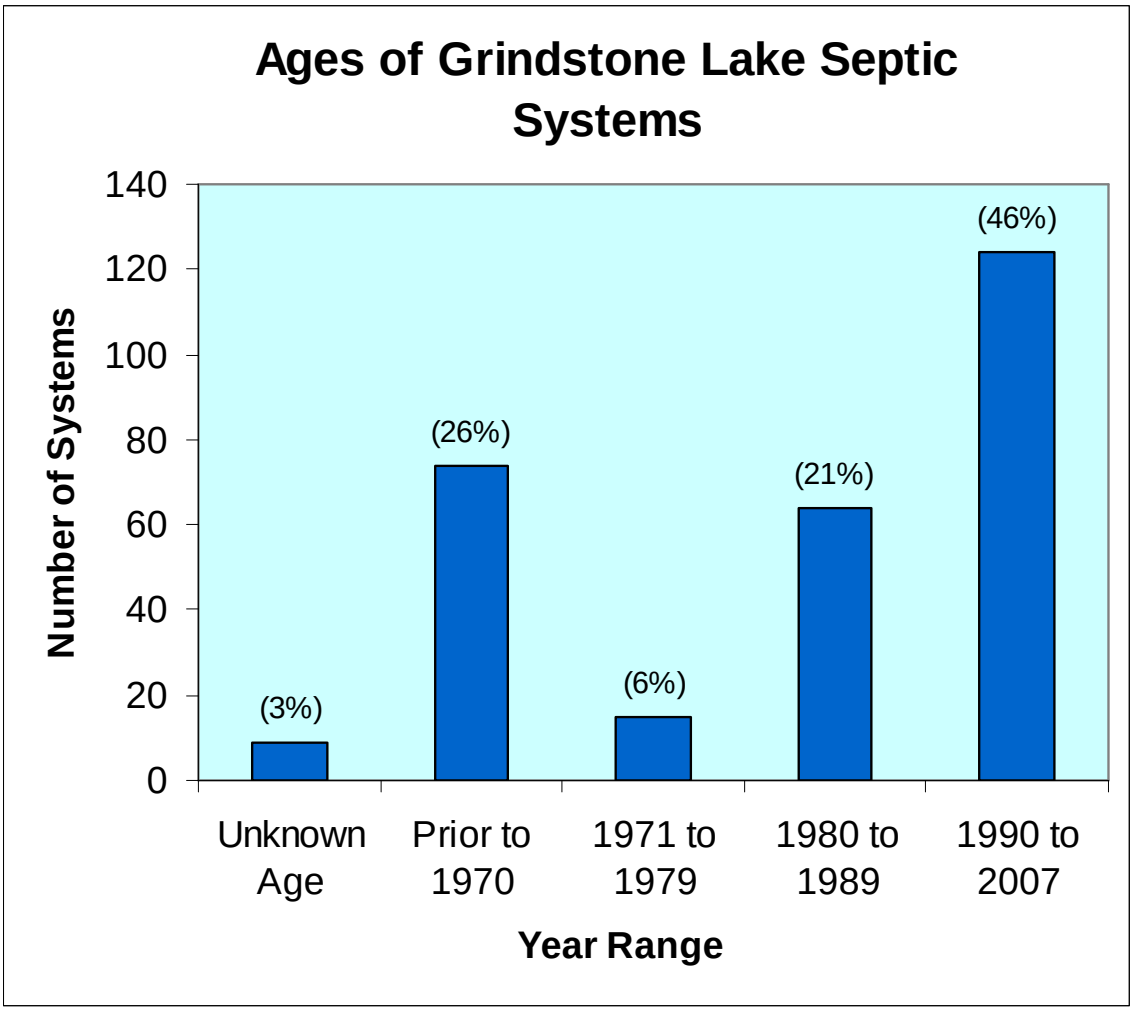
Graph 1



Graph 2



Graph 3


Ages of Grindstone Lake Septic Systems
Number of Systems
140
120
100
80
60
40
20
0
(3%)
(26%)
(6%)
(21%)
(46%)
Unknown Age
Prior to 1970
1971 to 1979
1980 to 1989
1990 to 2007
Year Range

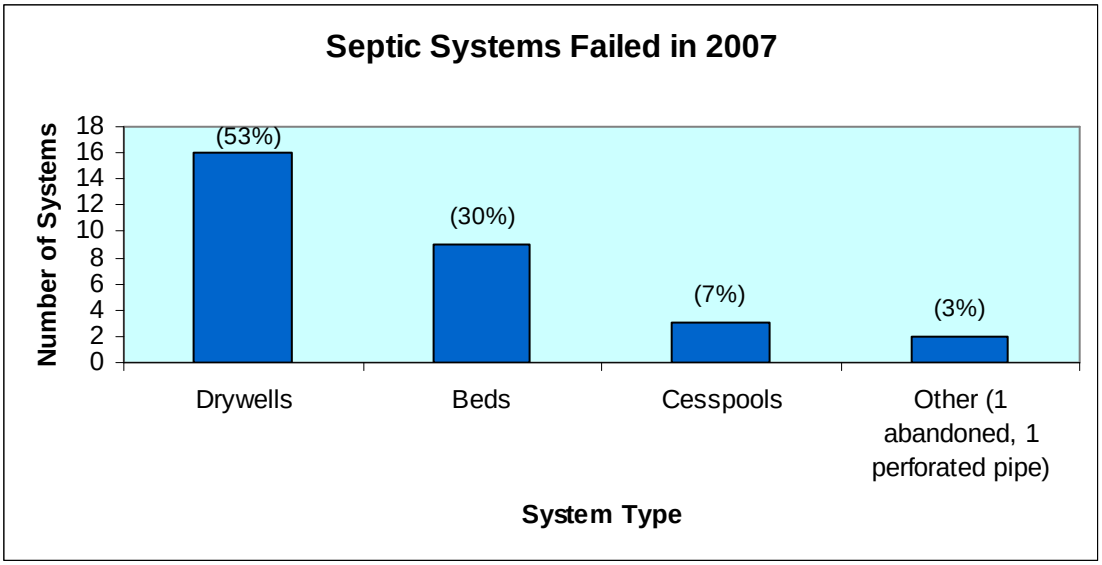
Failure Statistics

30 Failing Systems
31 Dwellings (1 shared system)

System Type	Number of Systems
Drywells	16
Beds	9
Cesspools	3
Other (1 abandoned, 1 perforated pipe)	2

Systems installed prior to 1970 = 28
1980 – 1990 = 1
1991 – 2007 = 1

Graph 4



Grindstone Lake - Passing Systems

Last Name(s)	First Name(s)
Alan/Smith	David/Cynthia
Anderson	John/Joyce
Anderson	Kenneth
Badal	Robert/Donna
Bandli	James
Banker	John/Susan
Barnett	Timothy/Pamela
Basting	Warren/Julia
Baumgart	John
Bawek	Mary Beth
Beck	Steven
Belland	Edgar/Yavonne
Berg	Larry
Bloom	John
Boger	Steve
Bone	Edward
Bosman	Matt/Claudia
Bosman	Micha/Becky
Brandt	Fred/Richard
Brennan	Timothy/Mary
Brinkman	Robert
Brody	William/Bronwen
Brossard	Howard/Eileen
Brown	Jeffery
Bruggerman	Thomas/Nancy
Buckley	James/Gayle
Buman	John/Marilyn
Buss	Steven
Butchart	Steven/Emily
Campbell	Allen/Jennifer
Carlsen	Alvin
Chevalier	Jeffery/Kimberly
Christensen	Carl/Carol
Chumas	Janice
Churn	John/Sheryl
Clark	John/Doreen
Condo	Grindstone Lake
Condo	Lake View
Condo	Oakwood Estates
Condo	Williams Bay
Crist	Thomas/Ann
Crowe	Kyle
CRS	Properties LLC
Dahlby	Ruth/Howard
Davis	Calvin/Mary
Deno	Stanley
Donaldson	Frank
Dooley	Michael
Dumas/Perrson	Gerald/Micheal
Dunn	James/Sally
Ehlers	Thomas/Linda

Last Name(s)	First Name(s)
Ellesson	Les/Barbara
Englebrecht	Edwin
Erickson	Dennis/Karen
Fandler	Daniel/Diane
Farley	David
Farrelll	Jeffery
Fitzgerald	Kevin
Foster	Frank/Betty
Frank	Steven
Freeman/Alber	Jennifer/Anthony
Friendshuh	Steven
Frillici	Marshal/Judy
Gamble	Scott/Jolynn
Garvey	James/Louise
Gilbertson	Steven
Gill	Micheal/Annette
Gleason	Thomas/Lorna
Gohman	Nancy/James
Gonyer	Gary/Kathy
Gorbatenko	George/Maria
Granger	Janmes/Katherine
Greely	John
Green	Doris
Groberg	Gregory/Janice
Gross	Dr.Micheal
Gross	Joseph
Gross	Michael
Haddad	Emily
Hamer	Charles
Hammond	Bruce/Judith
Hanson	Gary
Hanson	Thomas
Hartung	George
Hatzenbihler	Denny/Deb
Herbert	Bradley
Hobbie	James/Dolores
Hoebbell	Donald/Elizabeth
Hoff	Gary/Susan
Holmes	Trust
Holst	Paul/Anette
Hunt	Randall
Ihnot	Thomas/Candycee
Jacobsen	Karen
Jacobson	Thomas/Mary
Jaskiw	Laverne
Jeffery	David/Linda
Johnson	Bruce/Kaye
Johnson	Bruce/Mary
Johnson	Katherine
Johnson	Robert
Kaleel	Fred

Last Name(s)	First Name(s)
Kamrath	Micheal
Katner	Neil/Theresa
Keating	Joseph/Gloria
Kelly	Charles/Lisa
Kelly/Mesarchik	John/Michael
Kieffer	Herbert/Claudia
Kieffer	Paul/Carol
Klemenhagen	Douglas
Kling	Steven/Robert
Knight	Bruce/Nancy
Knops	Timothy/Laurie
Knutsen	Norman/Coryne
Kolb	Robert/Sally
Kooman	Peter/Winston
Koop	Elizabeth
Kowal	Gerald/Sandra
Kragness	Stephen/Pamela
Kramer	Rick/Dianne
Krusenstjerna	Del
Kuhns	Richard/Sharon
LaMarre	Susan
Landt	Louis/Nancy
Larson	Julie
Lewallen	David/Martha
Lindau	Philip/Nancy
Linder	Douglas/Margeret
Linton	Randall/Jane
Little	Bruce/Sally
Lokken	Stanley/Mary
Long	George/Jeanett
Lucas	Charlotte
Lund	Allen/Lois
Lundberg	Don/Marilyn
MacIntosh	Don/Cyndy
March	Paul
Marcinkowski/Norrell	
Markgren	Bruce
Marquard	Robert
McCarte	Allan
McCoid	David
McGraw	Ralph
McJoynt	Mary
McKittrick	Matt/Kerian
Meisterling	Robert/Janet
Melamed	Robert
Melton	Jeffrey/Darlene
Miley	Susan
Miller/Fullerton	Bruce/Christine
Mody	Kirit/Donna
Moeller	Ray
Mohamed	Imtiaz/Kahn

Last Name(s)	First Name(s)
Muenzberg	William/Melinda
Naegeli	Paul/Gail
Nathan	Trust
Nelsen	David
Newton	Gladys
Newton	Sarah/Charles
Nilsson	Eric/Lizabeth
Nilsson	Raymond/Orrell
Norwood Haven	Resort
O'Connell	William/Bardara
O'Cull	Kathleen
Oesterreicher	Donna
Ogren	Christopher/Pamela
O'Leary	Patrick
Olesak	Thomas
Olson	Gary/Ruth
Olson	Michael/Terri
O'Meara	David/Maureen
O'Meara	Thomas/Shaun
Orner	Kieth/Brenda
Pabich	Brian/Michele
Pachal	Randall/Kathleen
Pauleje	Joseph/Kathryn
Paulson	Bruce
Peterson	Gene/Susan
Peterson	Mary Jane
Pregarke	Gary/Kathleen
Pyle	Steve/Julie
Rajkowski	Gary/Sharon
RDH/PPK	Investments
Reichwald	Mardelle
Ricker	Mary
Rigotti	James/Kareen
Ross	James/Nancy
Rowe	John/Julie
Rubsam/Draxten	Stacy/Elizabeth
Ruedy	Donna
Ruedy	Jack
Ruedy	Robert/Penny
Ruger	TD LLC
Ryan	Russell/Jeanine
Sand Lake Shores	LLC
Savitski	Mike/Janelle
Schiefelbein	Duane/Joseph
Schmiel	Susan
Schobel	James/Cynthia
Schultz	Lewis
Scott	Kathleen
Seekel	Charles/Julianne
Seesel	Richard
Severson	Alberta

Last Name(s)	First Name(s)
Mower	Sara/William
Sickel	John
Sirota	Rita
Sislo/Schutta	Kevin/Antoinette
Skeie	Robert/Donna
Smith	Chritopher/Michelle
Smith	Dean
Sohlberg	Dag
Somerville	Gregory
Stein	Gunter
Storlie	Charles
Streeter	Lynn/Sheryl
Stress	Lawrence
Swanson	Lynn/Stephanie
Syverson	John/Lynn
Thide	Andrew/Susan
Utzinger	Michael
Vena	Guy/Marcia
Venners	Edward/Camille
Wagenman/Miller	Pat/Duane
Wanstad	Rob/Jeanne
Warren	Jeffery/Christine
Welch	Ronald/Cynthia
Whetstone	James/Elizabeth
Wiederin	Randal/Kimberly
Wieland	Lee
Winkle	Scott/Linda
Yarrusso	David

Last Name(s)	First Name(s)
Shal	Michael