

The Chain Letter

of the



Dedicated to the care and preservation of our lakes, for the enjoyment and safety of all.

January 2017

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LETTER FROM OUR PRESIDENT

January 16, 2017

I hope you all had a great Christmas and are having a happy, healthy New Year. So far this season has shown us lots of snow and lots of cold. My furnace has been working very hard and the snow is piling up along the drive way. I have only needed the 4 wheel drive of my pick-up a few times. Gail and I spend most of the winter here on Wabana with only short trips away and have come to really enjoy the winter here, watching the deer and winter birds. Ice-up this year on Wabana was December 10. We again attended the winter solstice party at Zimmerman's on Trout and had a great time.

The WCOLA leadership team again sent out a letter to all chain of lakes owners describing what we are all about and encouraging membership renewal. We included a survey this time, hoping to get feedback on what we can do better and what is important for us to focus on. So please, please, please spend a few moments to complete the survey and provide any comments/recommendations you would like. We are also looking for additions and replacements for the current team as it is time to get some new faces and ideas. This summer elections for both the president and vice president positions are required, so this is an opportunity for someone new.

We have been getting some inquiries from people new to the lake environment on how to use septic systems. John Zimmerman was good enough to assemble considerable information on proper care of septic systems and we have included it in this newsletter. Ken Zimmer has been tracking ice-up and ice-out on Wabana for over 17 years now while John Zimmerman has data on Trout since 1957; the most current 24 years are included in this newsletter.

2016 was a great year for WCOLA membership, we have 139 households on the books. This is the most we have had in several years. Thank you.

As I have mentioned in the past, the Water Quality Management Plan we developed last summer is complete and can be viewed on our web site at

www.wcola.org. The MPCA data collected during the 21016 season is now on their web site www.dnr.state.mn.us/lakefind/index.html. We are still waiting for RMB Labs to complete the analysis and reports for our chain of lakes now planned for the end of January 2017. These reports should include analysis of all the water quality data we and the MPCA have collected over the past 40 years. These reports should go a long ways toward helping us validate or make adjustments to our plan for the future. At this point, I am hoping to get your survey information to help guide us on our next focus, maybe invasive species, or something else.

Have a great rest of the winter.

A THOUGHT FOR ALL OF US

When it comes to protecting our lakes, stewardship is an attitude. It is the understanding that what we do on land and in the water affects the lake. It is recognition that lakes are vulnerable and that in order to make them thrive, citizens, both individually and collectively, must assume responsibility for their care.

Enjoy the lakes! This article was written and shared by Moriya Rufer at RMB Environmental Laboratories as part of continuing education for their Lakes Monitoring Program (218-846-1465, lakes@rmbel.info). To learn more, visit www.rmbel.info.

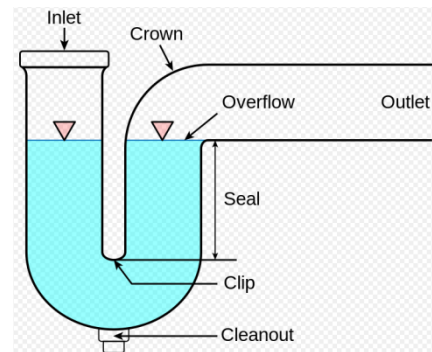
SEPTIC SYSTEM BASICS

John Zimmerman

I usually write about history, but the executive committee asked me to research and then share an article explaining the basics about septic systems. First, I must disclaim any authority in this area other than that of a curious homeowner, who lives on a lake and who has had septic systems in many of the homes he has owned in his past. I thought the best approach was to use quality, uncopied sources - so I could include what those who are more expert than I am have to share, to do it in a question and answer format, and to use pictures where they would serve better than words - here goes:

What is wastewater? "Wastewater is any water that has been adversely affected in quality by anthropogenic (or human impact on the environment) influence." So that can include industrial impacts, agricultural impacts, and domestic impacts on water. Today, for us that is the later, and can include human waste from the toilet, as well as showers, dish and clothes washing waste (the soaps and other additives as well as the "dirt" you are trying to remove and let run down the drain), and basically anything else you pour down one of your drains - like mop water and floor cleaning products, makeup, toothpaste, mouthwash, leftover food and alcohol, things you cook in like brine and salt, things you get on your hands and then clean over a sink, waste products you empty into the sink instead of the garbage can, etc. Anything you put in a drain ends up as part of the wastewater problem your septic system is trying to solve.

Where do the toilet/drains go? For the most part - gravity causes fluids and the waste they carry down the



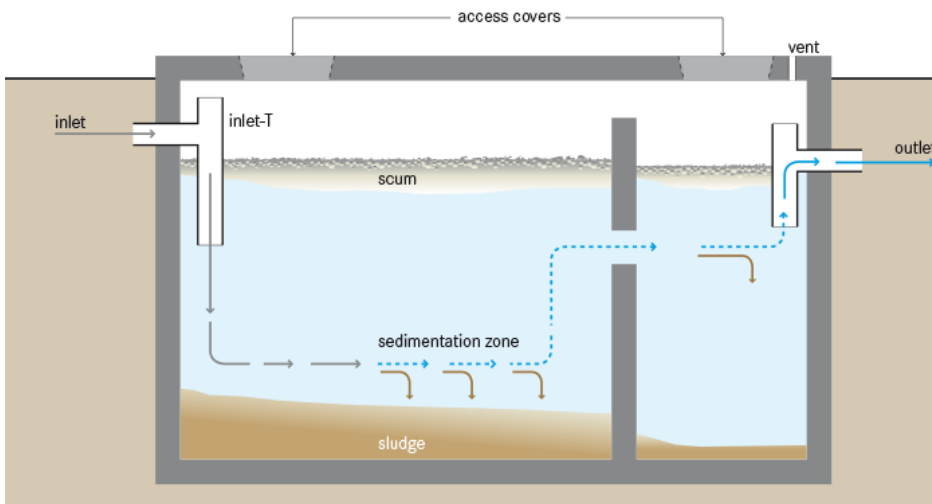
thru large pipes in your house called drains and then out the side of your house into your waste treatment solution. If you live in a city, likely that means

it runs into a municipal sewage system where the township, city or county manages the collection and cleaning of the water. But we all live remotely, and so we have personal waste water solutions - usually a septic tank and drain field. About 1/4 of American homes are connected to a septic tank and then drain field. Let's follow that water down the toilet / sink. First step is a "trap" which is an curved part of the pipe that traps water so that the gasses and terrible smells coming from a septic system cannot come back up to our homes thru the drain pipes. Past the trap, gravity continues to cause the water to flow downhill thru the pipes out of the house and into the septic tank.

How does a septic tank work? Our goal is to return the water that we "soiled" with waste, back to its natural state. Wikipedia says it like this: "The primary mechanism of biological waste recycling in the natural environment is performed by other organisms such as

animals, insects, soil microorganisms, plants, and fungi, which consume all available nutrients in the waste, leaving behind fully decomposed solids that become part of topsoil, and pure drinking water that has been stripped of everything that can possibly be consumed and utilized. This natural biological purification requires time to process wastes. In virtually all engineered onsite sewage facilities, recycling and decomposition by natural organisms is still the primary mechanism of sewage disposal. Giving the organisms the time they need to decompose wastes is accomplished by establishing minimum sewage retention and settling times, and minimum liquid flow distances between sewage disposal sites and surface water or water wells."

down) by a microbial ecosystem. The drain field typically consists of an arrangement of trenches containing perforated pipes and porous material (often gravel) covered by a layer of soil to prevent animals (and surface runoff) from reaching the wastewater distributed within those trenches... Many health departments require a percolation test ("perc" test) to establish suitability of drain field soil to receive septic tank effluent... the goal of percolation testing is to ensure the soil is permeable enough for septic tank effluent to percolate away from the drain field, but fine grained enough to filter out pathogenic bacteria and viruses before they travel far enough to reach a water well or surface water supply. Coarse soils – sand and gravel – can transmit wastewater away from the drain field before pathogens are destroyed. Silt and clay effectively filter out pathogens but allow very limited wastewater flow rates. Percolation tests measure the rate at which clean water disperses through a disposal trench into the soil."



So as I understand it, the waste flows out of the house, into the tank where it separates into three layers - sludge on the bottom that the bacteria "eats" causing further breakdown, scum which also is acted upon by the bacteria, and a nearer to water middle layer that flows into the second tank where the process

The first step is the septic tank , usually 1000-2000 gallon plastic or cement tank buried in the ground in such a manner as to allow gravity to bring the wastewater into "...the first chamber of the tank, allowing solids to settle and scum to float. The settled solids are anaerobically digested, reducing the volume of solids. The liquid component flows through the dividing wall into the second chamber, where further settlement takes place. The excess liquid, now in a relatively clear condition, then drains from the outlet into the septic drain field..."

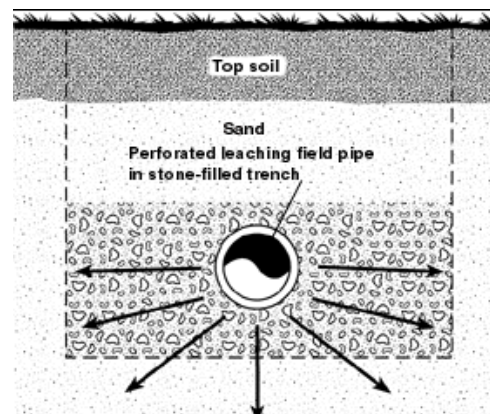
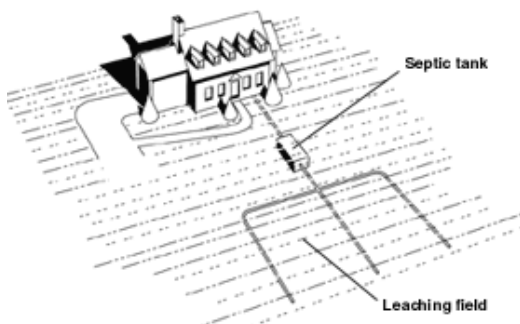
is completed again. That which is then nearest to water in the second tank - flows into a series of pipes with holes that are buried in soil that is fine enough to filter but not so fine as to block the flow of these fluids back into the environment - where soil and plants take up the nutrients or remaining waste and the filtered water re-enters the environment.

How does the drain field work? "The septic drain field

is effective for disposal of organic materials readily catabolized (broken

What can go wrong? Maintenance - You have to maintain the system - that is the tank has covers that come off and you pay someone to periodically inspect the tank for proper operation and to clean the sludge out of the bottom. If you wait too long - that sludge

builds up and eventually is carried to the drain field where it plugs up the field and causes the



system to fail. How often depends on many factors but essentially how big your tank or tanks are and how much you push thru them. For our house - where there are two of us and we live here year round with two sets of large tanks, our septic guy recommends cleaning every two years. We did it less when we were seasonal. A cleaning is cheap, a new drain field is expensive.

Wrong things added to wastewater - You and your family control what you choose to put into your septic system. There are many things that can hurt it. *"Septic tank and drain field microorganisms have very limited capability for catabolizing petroleum products and chlorinated solvents, and cannot remove dissolved metals.... Cleaning formulations may reduce drain field efficiency. Laundry bleach may slow or stop microbial activity in the drain field, and sanitizing or deodorizing chemicals may have similar effects. Detergents, solvents and drain cleaners may transport...dissolved fats into the drain field before they can be catabolized to short-chain organic acids in the septic tank scum layer...Flushing non-biodegradable waste items down the toilet such as cigarette butts, cotton buds/swabs...sanitary napkins or tampons and condoms can cause a septic tank to clog and fill rapidly."* **Physical malfunction** - Over time, the roots from trees can move or clog the buried pipes in a drain field. Covering the drain field with a non or semi-permeable layer (blacktop, ground cloth or weed barrier for example) will cause the system to fail. Rapid snow melt and floods can temporarily render the tank and field inoperable and may cause waste to flow in the opposite direction. Parts of a septic system, in harsh winters can freeze rendering the system useless.

Are there special circumstances because we live near a lake? Yes, besides the obvious issues if the system fails and sewage or wastewater is allowed to run to the lake, there can be other issues. *"Septic tanks by themselves are ineffective at removing nitrogen compounds that have potential to cause algal blooms in waterways into which affected water from a septic system finds its way. This can be remedied by using a nitrogen-reducing technology, or by simply ensuring that the leach field is properly sited to prevent direct entry of effluent into bodies of water."*

In conclusion, it is likely that my septic system is one of the biggest ways that Alida and I impact Trout lake. It was an expensive "investment" when we put the system in about 2000 and it is important that we understand how it works, what signs to look for in failing, how often to have it cleaned, what not to "flush" into it, where the drain field is and the pipes and tanks

involved in getting waste there so we avoid damaging them. We replaced an older and ineffective system, as well as an outhouse when we purchased our place and added on to our cabin. It is very likely that many of the homes and cabins around our lakes still employ poor and inadequate solutions that over time will lead to serious issues with lake water quality. Technology changes all the time and the solutions available to us are much better than those available to our parents or the families who owned our properties before we did. Those systems may include cesspools, grey water tanks, drain fields that long ago became clogged, holding tanks that are meant to be pumped regularly before filling but may not be. I think the best bet for each of us is to get a good understanding of what is beyond our sinks and toilets, where those pipes go, what is at the end of them, how well they work, and are they adequate for today's use. I would encourage each of you to begin in your own yard with an understanding of what you have and how it is working. And don't forget to regularly have them pumped or cleaned as making a mistake there gets expensive quickly.

GOVERNMENT LIAISON COMMITTEE

WCOLA has obtained two books titled 2015 Itasca County Aquatic Invasive Species Identification Guide. These books are available to members should they wish to become familiar with local invasive species or if they see something that they are suspicious of and wish to identify it. We will have a check-out system for these books in place by the time of our next newsletter and will supply that information at that time.

Should someone see something that they feel might be an aquatic invasive species they should call 218-256-4243 and their call will be directed to the appropriate person or site.

Bill Grantges, the Itasca County Aquatic Invasive Species Coordinator, supplied the following information about watercraft inspections on the Wabana Chain of Lakes. Bill gave the demonstration at the WCOLA picnic this year and he said that he wanted to thank the members for their suggestion that inspectors work later in the afternoon and evening since during the summer many boaters fish during the evening. He received feedback from his inspectors that they were surprised at the number of boats that launched after 4:30 PM and they were very happy to be there during these hours. The 2016 Itasca County AIS Watercraft Inspection Program was very busy in 2016. In 2016, there were more watercraft inspections in Itasca County than there were in the entire state of Montana. 18,471 watercraft

were inspected in Itasca County in 2016. This number is up from the 2015 total of 9,860. In 2014 29% of all incoming watercraft had AIS violations. At the end of 2015 that seasonal violation rate had dropped to 13%. The 2016 seasonal violation rate dropped to 4.6%. The Itasca AIS Program is working.

There were 2,058 inspections performed on Wabana Lake in 2016 on watercraft from 22 different states. During the 1,502 inspections hours spent on Wabana in 2016, 7.8% of all incoming watercraft had AIS violations. AIS violations found included: 69% plants found on trailer/boat/equipment, 13% had water found in them and 18% arrived with the drain plug in. There was one water craft found attempting to launch with a Zebra mussel attached, it was from Minnesota. 82% of all violations found on Wabana were from Minnesota watercraft.

Trout Lake Ice Up Ice Out

by John Zimmerman

Year	Ice Up	Ice Out
1993	December 18	April 28
1994	December 11	April 18
1995	November 28	April 25
1996	November 26	May 14
1197	January 3	April 27
1998	December 20	April 13
1999	December 22	April 26
2000	December 5	April 14
2001	December 20	April 29
2002	December 3	April 24
2003	December 2	April 25
2004	December 13	April 23
2005	December 2	April 18
2006	December 4	April 14
2007	December 4	April 26
2008	December 8	May 5
2009	December 13	May 1
2010	December 1	April 5
2011	December 9	April 29
2012	December 11	April 3
2013	November 24	May 17
2014	November 28	May 8
2015	December 25	April 17
2016	December 15	April 20

Wabana Ice-up/Ice-out

by Ken Zimmer

Dates	Ice-up	Days to ice-on	Ice - out	Days Ice -in
1999-2000	Dec 17	351	Apr 9	99
2000-2001	Dec 2	336	Apr 28	118
2001-2002	Dec 20	354	Apr 23	113
2002-2003	Nov 26	330	Apr 25	115
2003-2004	Nov 25, Ave Dec 6	329 Ave 340	Apr 23	113
2004-2005	Dec 14	348	Apr 17	107
2005-2006	Dec 2	336	Apr 14	104
2006-2007	Dec 1	335	Apr 25	115
2007-2008	Dec 1	335	May 6	126
2008-2009	Dec 2 Ave Dec 5	336 Ave 339	Apr 28	118
2009-2010	Dec 12	346	Apr 3	93
2010-2011	Dec 3	337	Apr 29	119
2011-2012	Dec 6	340	Mar 31	90
2012-2013	Dec 5	339	May 15	135
2013-2014	Nov 27 Ave Dec 5	331 Ave 339	May 9	129
2014-2015	Nov 21	325	Apr 15	105
2015-2016	Dec 19* Ave Dec 5	353 Ave 339	Apr 17 Ave Apr 22	107 Ave 112
2016-2017	Dec 10			
				AVE 100.5

Property values and lake water quality

If you give most people a choice, they would probably prefer



er to swim in a lake where you can see your feet standing chest-deep than one where you can't see your feet at knee-deep. Given this preference, we would assume that water clarity is a factor that determines recreating on lakes and purchasing lakeshore property. So how do you actually quantify this preference and does it really exist?

These questions were answered in a study conducted by researchers at Bemidji State University in 2003. They set out to determine if water quality of Minnesota lakes affects lakeshore property prices. The area of study included Hubbard, Cass, Crow Wing and Aitkin counties.

The researchers chose a variety of study lakes and examined residential lakeshore property sales that occurred over a five-year span. They used a hedonic model to attribute the portion of purchase price that is attributed to environmental amenities, such as water quality. The water quality measurement they used was secchi depth, which is a measurement of water clarity.

The results showed that water clarity has a significant positive relationship with property value. In other words, the better the water clarity, the more the property was worth. This result was true for

each of the lakes in the study.

This study also revealed that property values change when a lake is improved or degraded. With a one-meter (3.3 ft) decline in water clarity, property prices declined by an average of \$70 per frontage foot, which corresponds to \$5,250 for a 75 foot frontage lot. With a one-meter increase in water clarity, property prices improved by an average of \$46 per frontage foot, which corresponds to \$3,420 for a 75 foot frontage lot.

These results illustrate the importance of protecting lake water quality. Minnesota's lakes are extremely important to the recreation and tourism industry, as well as our local economy and individual property owners' investments.

If we all work together to protect water quality, we will see the benefit both aesthetically and economically.

Enjoy the lakes! This article was written and shared by Moriya Rufer at RMB Environmental Laboratories as part of continuing education for their Lakes Monitoring Program (218-846-1465, lakes@rmbel.info). To learn more, visit www.rmbel.info

Mark Your Calendars

2017 Season Events

May 1 Monday

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Road Clean-up-Town Hall

June 10 Saturday

*Kick-

off Social-Bluewater Bible Camp

June 21 Wednesday

Summer Solstice Party-Downing's

The first snowfall of the season on November 18, 2016. Photos were taken at 8:00am, noon, and 4:00pm.



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