

Report



Namakagon Chain of Lakes Sanitary Survey Report

Project I.D.: 08N015

**Namakagon Lake Association
Bayfield County, Wisconsin**

January 2011





January 5, 2011

Ms. Lisa Holt
1520 Hidden Valley Cir.
Houlton WI 54082

Dear Ms. Holt:

RE: *Lake Namakagon Sanitary Survey Report*

On behalf of the Namakagon Lake Association, Foth Infrastructure and Environment LLC (Foth) is submitting a Sanitary Survey. This Sanitary Survey, for the Lake Namakagon Chain of Lakes, presents the findings of the on-site survey, permit document review, and lake use.

Please contact us at (608) 242-5958, if you have any comments or questions regarding the information presented in this plan.

Sincerely,

Foth Infrastructure & Environment, LLC

A handwritten signature in black ink, appearing to read "B. L. Hinrichs", written in a cursive style.

Brian L. Hinrichs
Lead Environmental Scientist

cc: Pam Tosher, Wisconsin DNR

Namakagon Chain of Lakes
Sanitary Survey Report

Distribution

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Pam Toshner
Wisconsin Department of Natural Resources
810 W. Maple Street
Spooner WI 54801

Namakagon Chain of Lakes Sanitary Survey Report

Project ID: 08N015

Prepared for
Namakagon Lake Association
Bayfield County, Wisconsin

Prepared by
Foth Infrastructure & Environment, LLC

January 2011

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Namakagon Chain of Lakes Sanitary Survey Report

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Namakagon Chain of Lakes

Sanitary Survey Report

Executive Summary

Lake Namakagon is located in Bayfield County, Wisconsin, with the nearest town being Cable, Wisconsin. The Lake Namakagon Chain of Lakes is comprised of Lake Namakagon, Garden Lake, and Jackson Lake. The entire Namakagon River and Lake Namakagon are classified as “Outstanding Resource Waters” by the WDNR. Lake Namakagon provides year-round recreational opportunities including fishing, swimming, water skiing, pleasure boating, snowmobiling and more. With numerous resorts and vacation properties located on the lake tourism is a major part of the local economy and the need to protect the waters of Lake Namakagon and surrounding areas is vital.

As part of Namakagon Lake Association’s(NLA) initiative to protect the Namakagon Chain of Lakes (the Lakes) as a valuable resource, the Association has undertaken annual AIS surveys, clean water clean boat programs, the development of a lake management plan, and this sanitary survey of shoreline properties. Field observations and readings were taken over a three-day period in September, 2009, and permit data was obtained from the Bayfield County Planning and Zoning Department for sanitary sewer data.

Figure 1 - Namakagon Chain of Lakes



Source: WI DNR Surface Water Data Viewer, 2008 Air Photo

List of Abbreviations, Acronyms, and Symbols

Foth	Foth Infrastructure & Environment, LLC
GPS	global positioning system
the Lakes	Namakagon Chain of Lakes
NLA	Namakagon Lake Association
POWTS	Private Onsite Wastewater Treatment Systems
SAS	Soil Absorption System
SWIS	Septic Tank and a Subsurface Wastewater Infiltration System
TSI	Trophic State Index
WDNR	Wisconsin Department of Natural Resources

1 Introduction

Namakagon Lake Association (NLA) was formed in 1995 to address resource management concerns within the Lake Namakagon Chain of Lakes, which is comprised of Lake Namakagon, Garden Lake, and Jackson Lake. NLA has been and an active participant in the prevention of aquatic invasive species introduction to the Namakagon Chain. Over the past few years, NLA has been actively working with the Wisconsin Department of Natural Resources (WDNR) and consultants to develop and execute a monitoring program through successful grant applications. These efforts and proactive responses to the threat of invasive species infestations has been the key to keeping the Lakes free of aquatic invasive species. For the purposes of this report, the Lake Namakagon Chain will be referred to as the Lakes.

The entire Namakagon River and Lakes are classified as “Outstanding Resource Waters” by the WDNR. This is due in large part to the land use of the watershed, which is over 65% forestland and nearly 15% wetland in area. Much of these areas are county forest lands or part of the Chequamagon National Forest.

Lake water quality is degraded by many factors such as agricultural runoff, lawn fertilizers, pesticides, herbicides, soil erosion and sedimentation runoff, and failing septic systems. The NLA would like to ensure that all septic sewer systems are in code compliance with the Bayfield County Sanitation Ordinance and Department of Commerce Chapter 83 (Private Sewage Code). This is one of the contributing factors to lake degradation that can be corrected and controlled.

On behalf of the NLA, Foth Infrastructure & Environment, LLC (Foth) has conducted this *Sanitary Sewer Survey* of systems located along the shores of the Lakes. The purpose of this survey is to maintain groundwater and lake quality and clarity for the Lakes. This report presents the findings of the survey.

2 Purpose of Sewer Survey / General Overview

There are nearly 700,000 private onsite wastewater treatment systems (POWTS, septic systems) in Wisconsin – serving approximately 30 percent of all households in the state. Most septic systems are located in unincorporated areas. Proper maintenance of POWTS helps protect the health of the community and the environment. The Namakagon Chain has 177 permitted on-site wastewater systems on or adjacent to Namakagon, Jackson, or Garden Lakes. This survey is intended to document and evaluate the current status of these systems and provide recommendations on means to mitigate their effect on the lakes.

Waste flows from the house to a settling tank where solids settle out, allowing liquids to continue out to an absorption field. Bacteria in the settling tank break down solid waste leaving a sludge that needs to be removed periodically by a State of Wisconsin licensed septic hauler. The liquid seeps into the soil where some of the constituents are filtered and trapped, some are absorbed and used by plants, and some leaches into soils and groundwater. When systems fail the waste constituents (bacteria, nitrate, viruses, detergents, household chemicals and chloride) may contaminate groundwater and surface water, and pose public health threats. Even properly installed systems may contaminate groundwater if they are not used and maintained properly. About nine percent of the nitrate reaching groundwater in Wisconsin comes from septic systems.

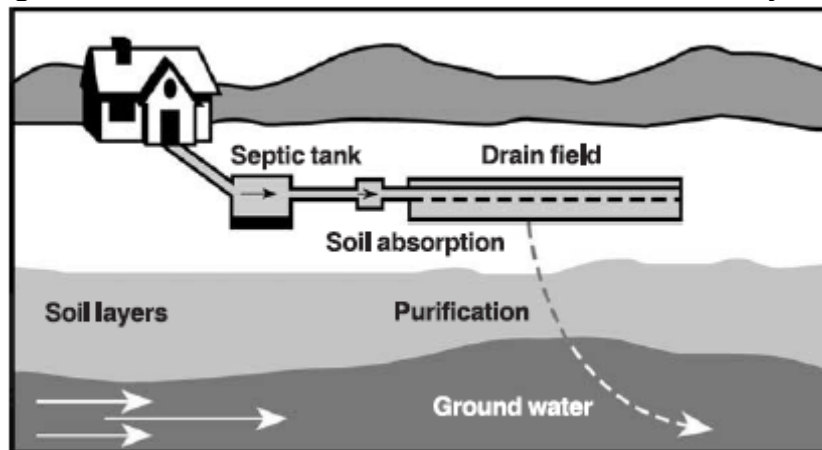
Failed septic systems contribute to the pollution of the groundwater, the local rivers and lakes, and the shorelines that are used for commercial and recreational activities by the community.

2.1 Types of Systems

POWTS technology has advanced throughout the years. Some of the 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.

Most onsite wastewater treatment systems are of the conventional type, consisting of a septic tank and a subsurface wastewater infiltration system (SWIS, aka leach field or infiltration trench).

Figure 2 – Conventional Onsite Wastewater Treatment System



Source: NSFC, 2000.

2.1.1 Privies

There are two basic types of privies. An open pit privy consists of a hole in the ground under a privy. An open pit privy requires a soil boring to prove that soils are suitable for waste. 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. Only one resident reported using a privy in the lake use survey. Bayfield County reported that three privy permits were in existence on or adjacent to the lakes.

2.1.2 Holding Tanks

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 2,000-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. Thirty-seven holding tank permits were reported by Bayfield County on or adjacent to the lakes.

2.1.3 Septic 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 contaminants from water which passes through the device or the water supply system downstream of the device. Bayfield County reported 171 septic tank permits for properties on or adjacent to the lakes.

Downstream of the septic tank is another component of a POWTS, the Soil Absorption System (SAS), also called a cell. A SAS cannot be wider than 6 feet; most 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, including 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 SAS.

A conventional lift system is similar to that of the gravity flow system, but the SAS is 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 SAS 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 SAS.

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.

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 on-site wastewater treatment components and systems will better protect public health and the waters of the state.

3 Lake Namakagon General Information

The Lakes are located in Bayfield County, Wisconsin, with the nearest town being Cable, Wisconsin. The Namakagon Chain is a large drainage lake, which has both an inlet and outlet stream flows and is located in the headwaters of the Namakagon River. The Lakes are comprised of 3,227 acres with a maximum depth of 51 feet and an average depth of 16 feet. The Lake habitats present in the survey area are very diverse and support a balanced fishery. The Lakes are classified by the WDNR as an A1 Muskellunge fishery. This classification is designated for “trophy waters” for their ability to produce large fish, even though overall numbers of fish may be low. Additionally, the entire Namakagon River and Lakes are classified as “Outstanding Resource Waters” by the WDNR.

The Lakes provide year-round recreational opportunities including fishing, swimming, water skiing, pleasure boating, snowmobiling and more. With numerous resorts and vacation properties located on the Lakes tourism is a major part of the local economy and the need to keep the waters of the Namakagon Chain and surrounding areas pristine is vital.

The following summarizes the lakes physical attributes of the Lakes:

Table 1 - Lake Namakagon Chain Data

Lake Type	Drainage
Surface Area (acres)	3,227
Maximum Depth (feet)	51
Shoreline Length (miles)	43
Catchment/Drainage Area (sq. miles)	197
Boat Landings	9
Residences	~275

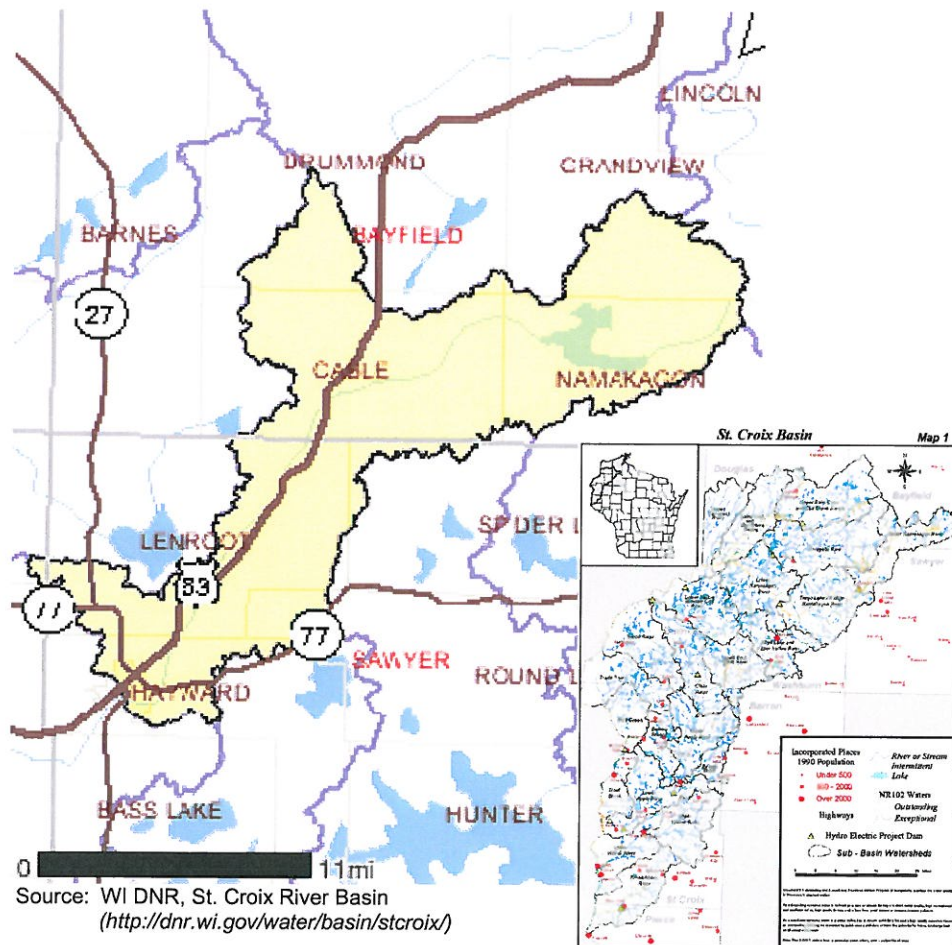
3.1 Namakagon Watershed

The Namakagon Chain is located in the Upper Namakagon River Watershed, which is a sub-

watershed of the St. Croix River Basin. The Namakagon Watershed's headwaters are in northwest Wisconsin, beginning in southwest Bayfield County, just south of the drainage divide between Lake Superior and Mississippi River system. The Namakagon River, 98 miles in length, begins at the outlet of Lake Namakagon, making its way southwest to Trego and then turning northwest until it enters the St. Croix River a few miles upstream of Riverside in northeast Burnett County.

The entire Namakagon River and Lakes are classified as "Outstanding Resource Waters" by the WDNR. This is due in large part to the land use of the watershed, which is over 65% forestland and nearly 15% wetland in area. Much of these areas are county forest lands or part of the Chequamegon National Forest. The Totagatic River, in the northern part of the watershed, is a major tributary to the Namakagon River. There are numerous lakes in the watershed, with Lake Namakagon, Nelson Lake, and the Minong Flowage among the largest.

Figure 3 - Upper Namakagon River Watershed



3.2 Namakagon Fishery

Namakagon and Jackson Lakes have a diverse fishery consisting of walleye, muskellunge, northern pike, largemouth bass, smallmouth bass, bluegill, pumpkinseed, rock bass, black crappie, yellow perch, white sucker, yellow bullhead, black bullhead, trout perch, tadpole madtom, common shiner, golden shiner, and spottail shiner.

Historic management of Namakagon Lake has included fishery surveys, stocking, and various length and bag regulations. Historic surveys for walleye occurred in 1989 and 1993 utilizing WDNR standardized treaty protocols (Hennessey 2002). Walleye surveys were also conducted in 1976 and 2000 using a different sampling protocol, i.e. electrofishing to both mark and recapture walleye for a population estimate.

Recent management has largely focused on public outreach and education, and habitat protection. Protecting spawning areas by efforts to remove beaver dams in tributaries has been used to attempt to regenerate lost riverine walleye spawning areas that had been historically used. Also, a sensitive area designation was completed in 2002 to help protect areas that are considered high value to aquatic biota and wildlife. In an attempt to increase habitat complexity in areas that had little vegetative cover, 24 fish cribs were cooperatively installed in 2002 and 2003.

3.3 Namakagon Water Quality

One way to measure a lakes water quality is through the use of Secchi disk readings. A Secchi disk is lowered into the water of a lake until it can be no longer seen by the observer. This depth of disappearance, called the Secchi depth, is a measure of the *transparency* of the water. Transparency can be affected by the color of the water, algae, and suspended sediments. Transparency decreases as color, suspended sediments, or algal abundance increases. Water is often stained yellow or brown by decaying plant matter. Algae are small, green aquatic plants whose abundance is related to the amount of plant nutrients, especially phosphorus and nitrogen. Transparency can, therefore, be affected by the amount of plant nutrients coming into the lake from sources such as sewage treatment plants, septic tanks, and lawn and agricultural fertilizer. Suspended sediments often come from sources such as resuspension from the lake bottom, construction sites, agricultural fields, and urban storm runoff.

Transparency is an indicator of the impact of human activity on the land surrounding the lake. If transparency is measured through the season and from year to year, trends in transparency may be observed. Transparency can serve as an early-warning that activities on the land are having an effect on a lake.

Secchi disk data allows us to determine the trophic status (or level of nutrient enrichment) of the lake. Trophic State Index (TSI) is a continuum scale of 0 to 100, corresponding with the clearest (and most nutrient poor) lake possible, to the least clear (and presumably, most nutrient rich) lake possible. Lakes can be divided into three main levels of nutrient enrichment categories. Data collected through the WDNR Citizen Lake Monitoring Program shows Lake Namakagon's TSI values, based on Secchi disk readings and Chlorophyll and Total Phosphorous samples, range from the mid 40s to mid 50s. This classifies Lake Namakagon on the border of mesotrophic and eutrophic.

It is important to note that the different lake classification categories actually make smooth transitions into each other. Meaning, data from one date may suggest eutrophic lake conditions and data from another date may suggest a mesotrophic lake condition. If the tendency for a lake is to be mesotrophic, we refer to the lake as being mesotrophic. Being that the Lake Namakagon Chain is made up of three different lakes, it is possible to have different classifications. An

example being Jackson Lake, which is much shallower and has a much denser vegetation base than the main lake and collected TSI data trends towards eutrophic conditions. It is also possible for different regions within a lake the size of Lake Namakagon with many large bays to have different classifications especially near an inlet or outlet stream.

4 The Lake Survey

The NLA hired Foth to conduct a sanitary survey of Lake Namakagon and prepare this report presenting the results of that survey. This is the first sanitary survey conducted by the Association. The on-site on-water survey was conducted on three consecutive days, September 14, 15, and 16, 2009.

Sewer permits provided by the Bayfield County Planning and Zoning Department were reviewed to gather information on the types and age of systems found along the lakeshore. Permits obtained in the following Township, Range, and Sections, within which the three lakes are located, were separated out as being the most likely to impact Lake Namakagon: Township 43, Range 6, Sections 2-4, 9-15, 21; Township 44, Range 6, Sections 33-35; and Township 43, Ranges 5, 6, 7, and 18.

4.1 Field Inspection Techniques

The survey consisted of visual confirmation of septic system, condition of lakeshore groundcover / plants and nearshore water quality.

Additionally, during the 3-day site reconnaissance, Foth staff documented methane readings from the near shore using a GM-16 Gas Detector-Passport to record ambient methane readings. The readings were recorded within 5 to 20 feet from the property edge on a continuous basis. The outboard motor was stopped for a period of at least 3 minutes prior to collecting readings to mitigate background interference from the outboard exhaust. The results of this survey did not find any indication of elevated methane at any of the residents on the Namakagon Chain. In addition, increased plant growth, raw sewage, or other indications of untreated or partially treated waste were not observed during this survey.

4.2 Failing 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 noncompliance is \$753.00.

4.2.1 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”. Another common excuse is, “we only use the cabin a couple of times a year.” State code does not rely on amount of usage. The 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.

4.3 Wisconsin Fund

The Wisconsin Fund Grant Program was established in 1978 to provide 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 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) Permanent residence must be in the state participating in the program and must be occupied by the owner 51% of the year.
- 2) The System must be considered failing by code.
- 3) A Private sewage system serving the principal residence or small commercial establishment was constructed prior to July 1, 1978.
- 4) A 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.

4.4 Sewer Survey Results

The permit data used for this report can be found in Appendix A.

4.4.1 Permit Review

The permit review of the specified Township-Range-Sections found 177 permitted sanitary sewers in the survey area. The following table provides the permit type and number of each.

Table 2 - Permit Type

Replacement	101
New	67
Add to Existing	3
Tank Only	3
Reconnect	1
Repair	1
Revision	1

The following table provides the sanitary sewer type and number of each.

Table 3 - Sanitary Sewer Type

Non-Pressurized In Ground	59
Holding Tank	37
Mound	36
Tank Only	3
Conventional	21
In Ground Pressure	10
Aerobic Treatment Unit	4
At Grade	4
Privy	3
Not Applicable / Unknown	2
Other	1

The following table provides the age categories for sanitary sewers and number of each.

Table 4 - Sanitary Sewer Age

Prior to 12-31-1999	37
1-1-2000 to 12-31-2005	89
1-1-2006	45
Not Applicable / Unknown	6

4.4.2 Field Observation

Scott McConnell, Foth Civil Technician, was on-site September 14-16, 2009, to perform field observations along the shores of Lake Namakagon, Jackson Lake, and Garden Lake. The air temperature ranged from 55° F to 72° F with winds calm to light (5 mph to 15 mph) from the northwest.

There were three (3) possible positive alarms, however these may have been due to boat motor exhaust, as on a second pass no at these three spots no alarm was detected.

Table 5 - Possible Detections

Jackson Lake (East side)	N46.24905° W091.11430°	Near map point 617
Lake Namakagon (North Bay, near old red cabins)	N46.23209° W091.09013°	Near map point 974
Garden Lake (South shore, Michigan Bay)	N46.20012° W091.06894°	Near map point 064

4.5 Lake Use Survey Results

On May 25, 2010, the NLA mailed a lake use and opinion survey to riparian property owners on the Namakagon Chain of Lakes. The entire survey was comprised of 48 total questions related to stakeholders perception of the overall resource quality, use, and specific questions about their properties including potable well and on-site waste water management questions. Five of the forty eight questions were specific to potable well and on-site waste water management (see Appendix B, questions 33 through 37).

Overall the respondent answers were consistent with the information obtained from Bayfield County Planning and Zoning Department. The following is a summary of the respondent's answers.

4.5.1 Question 33, Questions Related to Potable Well(s) Serving the Property

Ninety percent of the respondents reported that their properties were served by private potable wells. Over 75% reported that they had had their wells tested in the last ten years. Of the respondents that replied to the nature of the tests almost all reported testing for bacteria and nitrite and a vast majority reported including lead and pesticides in the analysis.

Over 75% of the 185 that responded to this question reported that their wells were either drilled (93) or driven points (37). A significant majority (106) of the respondents reported that their wells were constructed within the last 10 years; again this is consistent with the information collected on septic systems indicating a significant new construction and major remodeling surge on and adjacent to the lakes from the late 1990's until present.

4.5.2 Question 34, Type of Septic System Used at Residence

Approximately 75% of the 190 respondents to this question stated that their properties were served by a septic tank and drain field disposal system. Approximately 20% of the respondents stated that a holding tank was utilized to manage their waste water. This is consistent with the data collected from Bayfield County and is a higher ratio of on-site systems to holding tanks compared to other lakes in northern Wisconsin. This appears to indicate strong adherence to County and local zoning regulations and a significant number of newer homes and major remodeling projects that have taken place in the last 10 years on the Namakagon Chain.

4.5.3 Question 35, Age of Septic Systems

Approximately 40% of the 186 respondents to this question stated that their systems were less than 10 years old, 40 % stated that their systems were 10-25 years old, and approximately 20% stated that their systems were over 25 years old or did not know the age of their systems.

These results indicate that many systems on the Chain have been constructed during the era when county and state codes and enforcement required modern systems that were designed and engineered to site specific conditions to protect human health as well as the surface and ground water resources on and adjacent to the respondents properties.

4.5.4 Question 36, Frequency of System Pumping

Over 75% of the 176 respondents to this question reported that their systems were pumped (and presumed inspected) at least every three years. The largest percentage of this category reported having their systems pumped every three years in compliance with state and county rules.

Only three of the respondents reported that deviancies or code violations related to their systems were reported by the licensed inspectors to the property owners. This information is consistent with information provided by Bayfield County. In addition, over 95% of the respondents reported that they had no immediate plans to upgrade their systems in the next five years.

The results of this question indicate that the vast majority of the property owners are in compliance with existing state and local requirements for system maintenance and inspections and that there is not a significant incidence of deficiencies or code violations related to systems on and adjacent to the resource.

4.5.5 Question 37, Estimated Distance Between Potable Well and Septic System

It was difficult to conclusively interpret the answers to this question. Approximately 70% of the respondents reported that the separation between their well and septic systems was greater than 51 feet; however approximately 25% reported that the separation was observed to be in the 10 to 50 foot range. Given the aggressive enforcement by Bayfield County of existing codes it is

assumed that most of the respondents in this category did in fact have separations between the well and septic systems that are within those specified by codes and that it was just an interpretation error on the part of the respondents.

5 Project Discussion Summary

Approximately 177 on-site waste disposal management systems exist on or adjacent to the Namakagon Chain as reported by Bayfield County Planning and Zoning Department (Bayfield County). Of these permitted systems the vast majority (171) are either new, replacement, or additions to existing systems. In all these cases the systems were designed and inspected to assure compliance with current state and county codes for on-site waste disposal systems. According to Bayfield County there are no current open code enforcing actions for any of the 171 systems.

The results of the lake use survey did not reveal a perception on the part of the respondents of issues with their on-site systems or those of other residents on or adjacent to the resource. In addition, the results of the on-site on-water visual survey and methane survey conducted by Foth did not reveal evidence of failing or altered systems.

Bayfield County has a very aggressive monitoring program in place mandating inspections at least every three years in concurrence with the pumping of septic tanks within the county. This, along with public education by state, county, and plumbing professionals serving the area have resulted in well designed and managed systems both within the county and the Namakagon watershed.

6 Recommendations and Conclusions

Based upon the findings of this survey it is recommended that the NLA, Bayfield County, and the property owners on and adjacent to the Namakagon Chain continue their efforts to maintain well designed, managed, and code-compliant on-site wastewater systems within the Namakagon watershed. It is recommended that the NLA communicate with Bayfield County on at least a yearly basis to review the current state of on-site wastewater systems on or within the watershed including new, replacement, and repair permits as well as documented code violations and citations issued within the watershed.

It is also recommend that the NLA, Namakagon Township, and Grandview Township provide Wisconsin Department of Commerce and UW Extension on-site wastewater system educational information at their respective Town Halls and meeting places for the public to review. Notification of the existence of these educational materials as well as web links to informational web sites could be provided to residents in NLA and Township newsletters. It would also be recommended that local plumbers, septic pumpers, and potable well drillers be provided with educational information to leave with residents within the watershed when they have contact with the property owners.

6.1 Long Term Planning

The NLA, Namakagon Township and Grandview Township should evaluate the feasibility of forming a sanitary district to serve the Namakagon Chain. This could include small diameter

sewers connected to a treatment plant, on-site cluster systems (serving multiple residences and/or businesses) or a combination of the two options. The sanitary district would provide a long term mechanism to provide wastewater management options for residents and insure the long term protection of the quality of the Namakagon Chain water quality.

7 References

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Appendix A
Sanitary Sewer Reports

**Namakagon Lake
Sanitary Survey Data**
(sorted by Permit Type)

S-T-R	System Age (≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)	Permit Type	Sanitary Type
2-43-6	2000 - 2005	Add to existing	Non-Pressurized In Ground
3-43-6	2000 - 2005	Add to existing	In Ground Pressure
34-44-6	2000 - 2005	Add to existing	Conventional
10-43-6	2000 - 2005	New	Conventional
10-43-6	Pre-2000	New	Conventional
10-43-6	2000 - 2005	New	Holding Tanks
10-43-6	2000 - 2005	New	Holding Tanks
10-43-6	Post - 2005	New	Mound
10-43-6	2000 - 2005	New	Non-Pressurized In Ground
10-43-6	2000 - 2005	New	Non-Pressurized In Ground
10-43-6	2000 - 2005	New	Non-Pressurized In Ground
10-43-6	Post - 2005	New	Non-Pressurized In Ground
11-43-6	2000 - 2005	New	Mound
11-43-6	2000 - 2005	New	Non-Pressurized In Ground
12-43-6	Pre-2000	New	Holding Tanks
12-43-6	Post - 2005	New	Non-Pressurized In Ground
12-43-6	Post - 2005	New	Non-Pressurized In Ground
12-43-6		New	Privy
13-43-6	2000 - 2005	New	Holding Tanks
13-43-6	Post - 2005	New	Non-Pressurized In Ground
13-43-6	Post - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	At Grade
14-43-6	2000 - 2005	New	Mound
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	2000 - 2005	New	Holding Tanks
21-43-6	2000 - 2005	New	Holding Tanks
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Privy
21-43-6	2000 - 2005	New	Privy
2-43-6	Pre-2000	New	Conventional
2-43-6	Post-2005	New	Holding Tanks
2-43-6	Post-2005	New	Holding Tanks
2-43-6	2000 - 2005	New	Mound
2-43-6	2000 - 2005	New	Mound

**Namakagon Lake
Sanitary Survey Data**

(sorted by Permit Type)

S-T-R	System Age <i>(≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)</i>	Permit Type	Sanitary Type
2-43-6	2000 - 2005	New	Mound
2-43-6	Post-2005	New	Mound
2-43-6	Post-2005	New	Mound
2-43-6	Pre-2000	New	Mound
33-44-6	2000 - 2005	New	Non-Pressurized In Ground
33-44-6	2000 - 2005	New	Non-Pressurized In Ground
33-44-6	Post-2005	New	Non-Pressurized In Ground
3-43-6	2000 - 2005	New	Aerobic Treatment Unit
3-43-6	2000 - 2005	New	Holding Tanks
3-43-6	2000 - 2005	New	Mound
3-43-6	2000 - 2005	New	Non-Pressurized In Ground
3-43-6	Post - 2005	New	Non-Pressurized In Ground
34-44-6	2000 - 2005	New	Holding Tanks
34-44-6	2000 - 2005	New	Non-Pressurized In Ground
34-44-6	Post-2005	New	Non-Pressurized In Ground
34-44-6	Post-2005	New	Non-Pressurized In Ground
35-44-6	2000 - 2005	New	Holding Tanks
4-43-6	2000 - 2005	New	At Grade
4-43-6	Post - 2005	New	Mound
4-43-6	Post - 2005	New	Mound
4-43-6	Post - 2005	New	Mound
4-43-6	Post - 2005	New	Non-Pressurized In Ground
21-43-6		Reconnect	
33-44-6	Pre-2000	Repair	Mound
10-43-6	2000 - 2005	Replacement	At Grade
10-43-6	Pre-2000	Replacement	Conventional
10-43-6	Pre-2000	Replacement	Conventional
10-43-6	2000 - 2005	Replacement	Holding Tanks
10-43-6	Post - 2005	Replacement	Holding Tanks
10-43-6	Pre-2000	Replacement	Holding Tanks
10-43-6	Pre-2000	Replacement	Holding Tanks
10-43-6	2000 - 2005	Replacement	In Ground Pressure
10-43-6	2000 - 2005	Replacement	Mound
10-43-6	Post - 2005	Replacement	Mound
10-43-6	Post - 2005	Replacement	Mound
10-43-6	Pre-2000	Replacement	Mound
10-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
10-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
10-43-6	Post - 2005	Replacement	Non-Pressurized In Ground
11-43-6	Post - 2005	Replacement	Holding Tanks
11-43-6	Pre-2000	Replacement	Mound
11-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
12-43-6	Post - 2005	Replacement	Holding Tanks
12-43-6	2000 - 2005	Replacement	Mound
13-43-6	Pre-2000	Replacement	Conventional
13-43-6	Pre-2000	Replacement	Conventional

**Namakagon Lake
Sanitary Survey Data**
(sorted by Permit Type)

S-T-R	System Age (≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)	Permit Type	Sanitary Type
13-43-6	2000 - 2005	Replacement	Holding Tanks
13-43-6	2000 - 2005	Replacement	In Ground Pressure
13-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
13-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
13-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
13-43-6	Post - 2005	Replacement	Non-Pressurized In Ground
13-43-6		Replacement	Non-Pressurized In Ground
14-43-6	2000 - 2005	Replacement	Aerobic Treatment Unit
14-43-6	Post-2005	Replacement	Holding Tanks
14-43-6	2000 - 2005	Replacement	Mound
14-43-6	2000 - 2005	Replacement	Mound
14-43-6	2000 - 2005	Replacement	Mound
14-43-6	Pre-2000	Replacement	Mound
14-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
14-43-6		Replacement	Non-Pressurized In Ground
15-43-6	Post-2005	Replacement	Aerobic Treatment Unit
15-43-6	2000 - 2005	Replacement	Holding Tanks
15-43-6	Post-2005	Replacement	Holding Tanks
15-43-6	2000 - 2005	Replacement	Mound
15-43-6	2000 - 2005	Replacement	Mound
15-43-6	2000 - 2005	Replacement	Mound
21-43-6	Pre-2000	Replacement	Conventional
21-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
21-43-6	Post-2005	Replacement	Non-Pressurized In Ground
21-43-6	2000 - 2005	Replacement	Other
21-43-6	Pre-2000	Replacement	
2-43-6	Pre-2000	Replacement	Conventional
2-43-6	Pre-2000	Replacement	Conventional
2-43-6	Pre-2000	Replacement	Conventional
2-43-6	2000 - 2005	Replacement	Holding Tanks
2-43-6	2000 - 2005	Replacement	Holding Tanks
2-43-6	2000 - 2005	Replacement	Holding Tanks
2-43-6	Post-2005	Replacement	Holding Tanks
2-43-6	Pre-2000	Replacement	Holding Tanks
2-43-6	Pre-2000	Replacement	In Ground Pressure
2-43-6	Post-2005	Replacement	Mound
2-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
2-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
2-43-6	Post-2005	Replacement	Non-Pressurized In Ground
33-44-6	Post-2005	Replacement	Aerobic Treatment Unit
33-44-6	2000 - 2005	Replacement	Holding Tanks
33-44-6	Post-2005	Replacement	Non-Pressurized In Ground
33-44-6	Post-2005	Replacement	Non-Pressurized In Ground
3-43-6	Pre - 2000	Replacement	Conventional
3-43-6	2000 - 2005	Replacement	Holding Tanks
3-43-6	Post - 2005	Replacement	Holding Tanks
3-43-6	Post - 2005	Replacement	Holding Tanks
3-43-6	Pre - 2000	Replacement	Mound
3-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground

**Namakagon Lake
Sanitary Survey Data**
(sorted by Permit Type)

S-T-R	System Age (≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)	Permit Type	Sanitary Type
34-44-6	2000 - 2005	Replacement	Conventional
34-44-6	Post-2005	Replacement	Conventional
34-44-6	Post-2005	Replacement	Holding Tanks
34-44-6	Pre-2000	Replacement	Holding Tanks
34-44-6	2000 - 2005	Replacement	In Ground Pressure
34-44-6	Pre-2000	Replacement	Mound
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	Post-2005	Replacement	Non-Pressurized In Ground
34-44-6	Post-2005	Replacement	Non-Pressurized In Ground
4-43-6	2000 - 2005	Replacement	At Grade
4-43-6	2000 - 2005	Replacement	Holding Tanks
4-43-6	Post - 2005	Replacement	Holding Tanks
4-43-6	2000 - 2005	Replacement	In Ground Pressure
4-43-6	Pre-2000	Replacement	In Ground Pressure
4-43-6	Pre-2000	Replacement	In Ground Pressure
4-43-6	2000 - 2005	Replacement	Mound
4-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
4-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
9-43-6	Pre-2000	Replacement	Conventional
9-43-6	Post - 2005	Replacement	Holding Tanks
9-43-6	Pre-2000	Replacement	Holding Tanks
9-43-6	Pre-2000	Replacement	Holding Tanks
9-43-6	Pre-2000	Replacement	In Ground Pressure
9-43-6	2000 - 2005	Replacement	Mound
9-43-6	2000 - 2005	Replacement	Mound
9-43-6	Post - 2005	Replacement	Mound
9-43-6	Pre-2000	Replacement	Mound
12-43-6		Revision	Non-Pressurized In Ground
10-43-6	2000 - 2005	Tank Only	In Ground Pressure
10-43-6	2000 - 2005	Tank Only	Non-Pressurized In Ground
21-43-6	Post-2005	Tank Only	Mound

**Namakagon Lake
Sanitary Survey Data**

(sorted by Sanitary Type)

S-T-R	System Age (≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)	Permit Type	Sanitary Type
14-43-6	2000 - 2005	Replacement	Aerobic Treatment Unit
15-43-6	Post-2005	Replacement	Aerobic Treatment Unit
33-44-6	Post-2005	Replacement	Aerobic Treatment Unit
3-43-6	2000 - 2005	New	Aerobic Treatment Unit
10-43-6	2000 - 2005	Replacement	At Grade
14-43-6	2000 - 2005	New	At Grade
4-43-6	2000 - 2005	New	At Grade
4-43-6	2000 - 2005	Replacement	At Grade
10-43-6	2000 - 2005	New	Conventional
10-43-6	Pre-2000	New	Conventional
10-43-6	Pre-2000	Replacement	Conventional
10-43-6	Pre-2000	Replacement	Conventional
13-43-6	Pre-2000	Replacement	Conventional
13-43-6	Pre-2000	Replacement	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	Replacement	Conventional
2-43-6	Pre-2000	New	Conventional
2-43-6	Pre-2000	Replacement	Conventional
2-43-6	Pre-2000	Replacement	Conventional
2-43-6	Pre-2000	Replacement	Conventional
3-43-6	Pre - 2000	Replacement	Conventional
34-44-6	2000 - 2005	Add to existing	Conventional
34-44-6	2000 - 2005	Replacement	Conventional
34-44-6	Post-2005	Replacement	Conventional
9-43-6	Pre-2000	Replacement	Conventional
10-43-6	2000 - 2005	New	Holding Tanks
10-43-6	2000 - 2005	New	Holding Tanks
10-43-6	2000 - 2005	Replacement	Holding Tanks
10-43-6	Post - 2005	Replacement	Holding Tanks
10-43-6	Pre-2000	Replacement	Holding Tanks
10-43-6	Pre-2000	Replacement	Holding Tanks
11-43-6	Post - 2005	Replacement	Holding Tanks
12-43-6	Pre-2000	New	Holding Tanks
12-43-6	Post - 2005	Replacement	Holding Tanks
13-43-6	2000 - 2005	New	Holding Tanks
13-43-6	2000 - 2005	Replacement	Holding Tanks
14-43-6	Post-2005	Replacement	Holding Tanks
15-43-6	2000 - 2005	Replacement	Holding Tanks
15-43-6	Post-2005	Replacement	Holding Tanks
21-43-6	2000 - 2005	New	Holding Tanks
21-43-6	2000 - 2005	New	Holding Tanks
2-43-6	Post-2005	New	Holding Tanks

Namakagon Lake
Sanitary Survey Data
(sorted by Sanitary Type)

S-T-R	System Age <i>(≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)</i>	Permit Type	Sanitary Type
2-43-6	Post-2005	New	Holding Tanks
2-43-6	2000 - 2005	Replacement	Holding Tanks
2-43-6	2000 - 2005	Replacement	Holding Tanks
2-43-6	2000 - 2005	Replacement	Holding Tanks
2-43-6	Post-2005	Replacement	Holding Tanks
2-43-6	Pre-2000	Replacement	Holding Tanks
33-44-6	2000 - 2005	Replacement	Holding Tanks
3-43-6	2000 - 2005	New	Holding Tanks
3-43-6	2000 - 2005	Replacement	Holding Tanks
3-43-6	Post - 2005	Replacement	Holding Tanks
3-43-6	Post - 2005	Replacement	Holding Tanks
34-44-6	2000 - 2005	New	Holding Tanks
34-44-6	Post-2005	Replacement	Holding Tanks
34-44-6	Pre-2000	Replacement	Holding Tanks
35-44-6	2000 - 2005	New	Holding Tanks
4-43-6	2000 - 2005	Replacement	Holding Tanks
4-43-6	Post - 2005	Replacement	Holding Tanks
9-43-6	Post - 2005	Replacement	Holding Tanks
9-43-6	Pre-2000	Replacement	Holding Tanks
9-43-6	Pre-2000	Replacement	Holding Tanks
10-43-6	2000 - 2005	Replacement	In Ground Pressure
10-43-6	2000 - 2005	Tank Only	In Ground Pressure
13-43-6	2000 - 2005	Replacement	In Ground Pressure
2-43-6	Pre-2000	Replacement	In Ground Pressure
3-43-6	2000 - 2005	Add to existing	In Ground Pressure
34-44-6	2000 - 2005	Replacement	In Ground Pressure
4-43-6	2000 - 2005	Replacement	In Ground Pressure
4-43-6	Pre-2000	Replacement	In Ground Pressure
4-43-6	Pre-2000	Replacement	In Ground Pressure
9-43-6	Pre-2000	Replacement	In Ground Pressure
10-43-6	Post - 2005	New	Mound
10-43-6	2000 - 2005	Replacement	Mound
10-43-6	Post - 2005	Replacement	Mound
10-43-6	Post - 2005	Replacement	Mound
10-43-6	Pre-2000	Replacement	Mound
11-43-6	2000 - 2005	New	Mound
11-43-6	Pre-2000	Replacement	Mound
12-43-6	2000 - 2005	Replacement	Mound
14-43-6	2000 - 2005	New	Mound
14-43-6	2000 - 2005	Replacement	Mound
14-43-6	2000 - 2005	Replacement	Mound
14-43-6	2000 - 2005	Replacement	Mound
14-43-6	Pre-2000	Replacement	Mound
15-43-6	2000 - 2005	Replacement	Mound
15-43-6	2000 - 2005	Replacement	Mound
15-43-6	2000 - 2005	Replacement	Mound
21-43-6	Post-2005	Tank Only	Mound

**Namakagon Lake
Sanitary Survey Data**
(sorted by Sanitary Type)

S-T-R	System Age (≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)	Permit Type	Sanitary Type
2-43-6	2000 - 2005	New	Mound
2-43-6	2000 - 2005	New	Mound
2-43-6	2000 - 2005	New	Mound
2-43-6	Post-2005	New	Mound
2-43-6	Post-2005	New	Mound
2-43-6	Pre-2000	New	Mound
2-43-6	Post-2005	Replacement	Mound
33-44-6	Pre-2000	Repair	Mound
3-43-6	2000 - 2005	New	Mound
3-43-6	Pre - 2000	Replacement	Mound
34-44-6	Pre-2000	Replacement	Mound
4-43-6	Post - 2005	New	Mound
4-43-6	Post - 2005	New	Mound
4-43-6	Post - 2005	New	Mound
4-43-6	2000 - 2005	Replacement	Mound
9-43-6	2000 - 2005	Replacement	Mound
9-43-6	2000 - 2005	Replacement	Mound
9-43-6	Post - 2005	Replacement	Mound
9-43-6	Pre-2000	Replacement	Mound
10-43-6	2000 - 2005	New	Non-Pressurized In Ground
10-43-6	2000 - 2005	New	Non-Pressurized In Ground
10-43-6	2000 - 2005	New	Non-Pressurized In Ground
10-43-6	Post - 2005	New	Non-Pressurized In Ground
10-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
10-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
10-43-6	Post - 2005	Replacement	Non-Pressurized In Ground
10-43-6	2000 - 2005	Tank Only	Non-Pressurized In Ground
11-43-6	2000 - 2005	New	Non-Pressurized In Ground
11-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
12-43-6	Post - 2005	New	Non-Pressurized In Ground
12-43-6	Post - 2005	New	Non-Pressurized In Ground
12-43-6		Revision	Non-Pressurized In Ground
13-43-6	Post - 2005	New	Non-Pressurized In Ground
13-43-6	Post - 2005	New	Non-Pressurized In Ground
13-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
13-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
13-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
13-43-6	Post - 2005	Replacement	Non-Pressurized In Ground
13-43-6		Replacement	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
14-43-6		Replacement	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground

**Namakagon Lake
Sanitary Survey Data**
(sorted by Sanitary Type)

S-T-R	System Age <i>(≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)</i>	Permit Type	Sanitary Type
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6		New	Non-Pressurized In Ground
21-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
21-43-6	Post-2005	Replacement	Non-Pressurized In Ground
2-43-6	2000 - 2005	Add to existing	Non-Pressurized In Ground
2-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
2-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
2-43-6	Post-2005	Replacement	Non-Pressurized In Ground
33-44-6	2000 - 2005	New	Non-Pressurized In Ground
33-44-6	2000 - 2005	New	Non-Pressurized In Ground
33-44-6	Post-2005	New	Non-Pressurized In Ground
33-44-6	Post-2005	Replacement	Non-Pressurized In Ground
33-44-6	Post-2005	Replacement	Non-Pressurized In Ground
3-43-6	2000 - 2005	New	Non-Pressurized In Ground
3-43-6	Post - 2005	New	Non-Pressurized In Ground
3-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	New	Non-Pressurized In Ground
34-44-6	Post-2005	New	Non-Pressurized In Ground
34-44-6	Post-2005	New	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	Post-2005	Replacement	Non-Pressurized In Ground
34-44-6	Post-2005	Replacement	Non-Pressurized In Ground
4-43-6	Post - 2005	New	Non-Pressurized In Ground
4-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
4-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
21-43-6	2000 - 2005	Replacement	Other
12-43-6		New	Privy
21-43-6	2000 - 2005	New	Privy
21-43-6	2000 - 2005	New	Privy
21-43-6		Reconnect	
21-43-6	Pre-2000	Replacement	

**Namakagon Lake
Sanitary Survey Data**
(sorted by System Age)

S-T-R	System Age <i>(≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)</i>	Permit Type	Sanitary Type
3-43-6	Pre - 2000	Replacement	Conventional
3-43-6	Pre - 2000	Replacement	Mound
10-43-6	Pre-2000	New	Conventional
10-43-6	Pre-2000	Replacement	Conventional
10-43-6	Pre-2000	Replacement	Conventional
10-43-6	Pre-2000	Replacement	Holding Tanks
10-43-6	Pre-2000	Replacement	Holding Tanks
10-43-6	Pre-2000	Replacement	Mound
11-43-6	Pre-2000	Replacement	Mound
12-43-6	Pre-2000	New	Holding Tanks
13-43-6	Pre-2000	Replacement	Conventional
13-43-6	Pre-2000	Replacement	Conventional
14-43-6	Pre-2000	Replacement	Mound
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	New	Conventional
21-43-6	Pre-2000	Replacement	Conventional
21-43-6	Pre-2000	Replacement	
2-43-6	Pre-2000	New	Conventional
2-43-6	Pre-2000	Replacement	Conventional
2-43-6	Pre-2000	Replacement	Conventional
2-43-6	Pre-2000	Replacement	Conventional
2-43-6	Pre-2000	Replacement	Holding Tanks
2-43-6	Pre-2000	Replacement	In Ground Pressure
2-43-6	Pre-2000	New	Mound
33-44-6	Pre-2000	Repair	Mound
34-44-6	Pre-2000	Replacement	Holding Tanks
34-44-6	Pre-2000	Replacement	Mound
4-43-6	Pre-2000	Replacement	In Ground Pressure
4-43-6	Pre-2000	Replacement	In Ground Pressure
9-43-6	Pre-2000	Replacement	Conventional
9-43-6	Pre-2000	Replacement	Holding Tanks
9-43-6	Pre-2000	Replacement	Holding Tanks
9-43-6	Pre-2000	Replacement	In Ground Pressure
9-43-6	Pre-2000	Replacement	Mound
10-43-6	2000 - 2005	Replacement	At Grade
10-43-6	2000 - 2005	New	Conventional
10-43-6	2000 - 2005	New	Holding Tanks
10-43-6	2000 - 2005	New	Holding Tanks
10-43-6	2000 - 2005	Replacement	Holding Tanks
10-43-6	2000 - 2005	Replacement	In Ground Pressure
10-43-6	2000 - 2005	Tank Only	In Ground Pressure
10-43-6	2000 - 2005	Replacement	Mound
10-43-6	2000 - 2005	New	Non-Pressurized In Ground
10-43-6	2000 - 2005	New	Non-Pressurized In Ground
10-43-6	2000 - 2005	New	Non-Pressurized In Ground

**Namakagon Lake
Sanitary Survey Data**
(sorted by System Age)

S-T-R	System Age (≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)	Permit Type	Sanitary Type
10-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
10-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
10-43-6	2000 - 2005	Tank Only	Non-Pressurized In Ground
11-43-6	2000 - 2005	New	Mound
11-43-6	2000 - 2005	New	Non-Pressurized In Ground
11-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
12-43-6	2000 - 2005	Replacement	Mound
13-43-6	2000 - 2005	New	Holding Tanks
13-43-6	2000 - 2005	Replacement	Holding Tanks
13-43-6	2000 - 2005	Replacement	In Ground Pressure
13-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
13-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
13-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
14-43-6	2000 - 2005	Replacement	Aerobic Treatment Unit
14-43-6	2000 - 2005	New	At Grade
14-43-6	2000 - 2005	New	Mound
14-43-6	2000 - 2005	Replacement	Mound
14-43-6	2000 - 2005	Replacement	Mound
14-43-6	2000 - 2005	Replacement	Mound
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	New	Non-Pressurized In Ground
14-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
15-43-6	2000 - 2005	Replacement	Holding Tanks
15-43-6	2000 - 2005	Replacement	Mound
15-43-6	2000 - 2005	Replacement	Mound
15-43-6	2000 - 2005	Replacement	Mound
21-43-6	2000 - 2005	New	Holding Tanks
21-43-6	2000 - 2005	New	Holding Tanks
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	New	Non-Pressurized In Ground
21-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
21-43-6	2000 - 2005	Replacement	Other
21-43-6	2000 - 2005	New	Privy
21-43-6	2000 - 2005	New	Privy
2-43-6	2000 - 2005	Replacement	Holding Tanks
2-43-6	2000 - 2005	Replacement	Holding Tanks
2-43-6	2000 - 2005	Replacement	Holding Tanks
2-43-6	2000 - 2005	New	Mound
2-43-6	2000 - 2005	New	Mound
2-43-6	2000 - 2005	New	Mound
2-43-6	2000 - 2005	Add to existing	Non-Pressurized In Ground
2-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
2-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground

**Namakagon Lake
Sanitary Survey Data**
(sorted by System Age)

S-T-R	System Age <i>(≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)</i>	Permit Type	Sanitary Type
33-44-6	2000 - 2005	Replacement	Holding Tanks
33-44-6	2000 - 2005	New	Non-Pressurized In Ground
33-44-6	2000 - 2005	New	Non-Pressurized In Ground
3-43-6	2000 - 2005	New	Aerobic Treatment Unit
3-43-6	2000 - 2005	New	Holding Tanks
3-43-6	2000 - 2005	Replacement	Holding Tanks
3-43-6	2000 - 2005	Add to existing	In Ground Pressure
3-43-6	2000 - 2005	New	Mound
3-43-6	2000 - 2005	New	Non-Pressurized In Ground
3-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	Add to existing	Conventional
34-44-6	2000 - 2005	Replacement	Conventional
34-44-6	2000 - 2005	New	Holding Tanks
34-44-6	2000 - 2005	Replacement	In Ground Pressure
34-44-6	2000 - 2005	New	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
34-44-6	2000 - 2005	Replacement	Non-Pressurized In Ground
35-44-6	2000 - 2005	New	Holding Tanks
4-43-6	2000 - 2005	New	At Grade
4-43-6	2000 - 2005	Replacement	At Grade
4-43-6	2000 - 2005	Replacement	Holding Tanks
4-43-6	2000 - 2005	Replacement	In Ground Pressure
4-43-6	2000 - 2005	Replacement	Mound
4-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
4-43-6	2000 - 2005	Replacement	Non-Pressurized In Ground
9-43-6	2000 - 2005	Replacement	Mound
9-43-6	2000 - 2005	Replacement	Mound
10-43-6	Post - 2005	Replacement	Holding Tanks
10-43-6	Post - 2005	New	Mound
10-43-6	Post - 2005	Replacement	Mound
10-43-6	Post - 2005	Replacement	Mound
10-43-6	Post - 2005	New	Non-Pressurized In Ground
10-43-6	Post - 2005	Replacement	Non-Pressurized In Ground
11-43-6	Post - 2005	Replacement	Holding Tanks
12-43-6	Post - 2005	Replacement	Holding Tanks
12-43-6	Post - 2005	New	Non-Pressurized In Ground
12-43-6	Post - 2005	New	Non-Pressurized In Ground
13-43-6	Post - 2005	New	Non-Pressurized In Ground
13-43-6	Post - 2005	New	Non-Pressurized In Ground
13-43-6	Post - 2005	Replacement	Non-Pressurized In Ground
3-43-6	Post - 2005	Replacement	Holding Tanks
3-43-6	Post - 2005	Replacement	Holding Tanks
3-43-6	Post - 2005	New	Non-Pressurized In Ground
4-43-6	Post - 2005	Replacement	Holding Tanks
4-43-6	Post - 2005	New	Mound
4-43-6	Post - 2005	New	Mound

**Namakagon Lake
Sanitary Survey Data**

(sorted by System Age)

S-T-R	System Age	Permit Type	Sanitary Type
	<i>(≤ 12-31-1999; 1-1-2000 to 12-31-2005; ≥ 1-1-2006)</i>		
4-43-6	Post - 2005	New	Mound
4-43-6	Post - 2005	New	Non-Pressurized In Ground
9-43-6	Post - 2005	Replacement	Holding Tanks
9-43-6	Post - 2005	Replacement	Mound
14-43-6	Post-2005	Replacement	Holding Tanks
15-43-6	Post-2005	Replacement	Aerobic Treatment Unit
15-43-6	Post-2005	Replacement	Holding Tanks
21-43-6	Post-2005	Tank Only	Mound
21-43-6	Post-2005	Replacement	Non-Pressurized In Ground
2-43-6	Post-2005	New	Holding Tanks
2-43-6	Post-2005	New	Holding Tanks
2-43-6	Post-2005	Replacement	Holding Tanks
2-43-6	Post-2005	New	Mound
2-43-6	Post-2005	New	Mound
2-43-6	Post-2005	Replacement	Mound
2-43-6	Post-2005	Replacement	Non-Pressurized In Ground
33-44-6	Post-2005	Replacement	Aerobic Treatment Unit
33-44-6	Post-2005	New	Non-Pressurized In Ground
33-44-6	Post-2005	Replacement	Non-Pressurized In Ground
33-44-6	Post-2005	Replacement	Non-Pressurized In Ground
34-44-6	Post-2005	Replacement	Conventional
34-44-6	Post-2005	Replacement	Holding Tanks
34-44-6	Post-2005	New	Non-Pressurized In Ground
34-44-6	Post-2005	New	Non-Pressurized In Ground
34-44-6	Post-2005	Replacement	Non-Pressurized In Ground
34-44-6	Post-2005	Replacement	Non-Pressurized In Ground
12-43-6		Revision	Non-Pressurized In Ground
12-43-6		New	Privy
13-43-6		Replacement	Non-Pressurized In Ground
14-43-6		Replacement	Non-Pressurized In Ground
21-43-6		New	Non-Pressurized In Ground
21-43-6		Reconnect	

Appendix B
Lake Use & Opinion Survey Results

Namakagon Lake Association
Lake Use and Opinion Survey

1 Which lake borders your property? If you own property on more than one lake, please answer for the one you've owned the longest and use this property as your reference for the remaining questions.

(all 207 answered)

154 Namakagon Lake
39 Garden Lake
14 Jackson Lake

2 Do you:

(2 did not check either box)

205 own property on this lake
0 lease property on this lake

3 Which of the following best describes when you would be most likely to use the lake? (Please check x only one.)

(all 207 answered in some way; 16 did not check a box, but provided a written 'other' or answered question a and/or b)
(some respondents checked more than one box)

58 Year-round resident
54 Weekends -- Year-round
16 Weekends -- Summer
20 Weekends -- Occasional
36 Vacations / Holidays
21 Summertime resident
11 Other (please list)
1/month-year round
1/yr
30 to 40 days, most in spring, summer, autumn
7/1 - 10/15 yrly
hunting season
rent out when not using
spr thru fall
spring and fall
summer-week/time
X
weekly ?? Summer

a. How far is the one-way distance from your permanent residence?

ranged from 30 miles to 2,500 miles (142 answered)

b. About how many times do you visit each year?

ranged from once a year to 50 times per year (135 answered)

4 During the past 3 years, which of the following activities have you participated in on the lake that borders your property? (Check x all that apply.)

(206 answered; 1 respondent wrote "none" in the 'other' space)

192	a. boating (motor/pontoon)	47	g. picnicking	52	m. cross-county skiing
117	b. canoeing/rowing/kayaking	153	h. fishing/ice fishing	172	n. peace and solitude
12	c. sailing/windsurfing	153	i. wildlife observation	166	o. scenic enjoyment
31	d. personal watercraft (jet ski)	113	j. swimming/scuba	46	p. hunting
71	e. water skiing	19	k. ice skating	83	q. snowmobiling
162	f. entertaining friends	78	l. hiking	22	r. other (1 provided 2 activities)
				1	ATV
				4	biking, road/mountain
				2	bird watching
				1	dining
				1	flying
				1	gathering
				2	golf
				1	none
				1	photography
				1	RC model boats
				5	snow shoeing
				1	tree & flower planting
				1	visiting friends
				1	work

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Lake Use and Opinion Survey**

5 Of these activities, which three do you value the most? (enter the letters on the lines below)

(203 answered)

Total	1st	2nd	3rd	
126	69	36	21	a. boating (motor/pontoon)
22	6	7	9	b. canoeing/rowing/kayaking
0				c. sailing/windsurfing
2		2		d. personal watercraft (jet ski)
9	2	4	3	e. water skiing
51	3	18	30	f. entertaining friends
2	1	1		g. picnicking
85	29	33	23	h. fishing/ice fishing
52	7	23	22	i. wildlife observation
12	2	3	7	j. swimming/scuba
0				k. ice skating
6		1	5	l. hiking
11	3	3	5	m. cross-county skiing
94	47	23	24	n. peace and solitude
75	18	27	30	o. scenic enjoyment
15	4	4	7	p. hunting
30	9	12	9	q. snowmobiling
				r. other _____
1	1			ATV
4	1	2	1	biking, road/mountain
2		2		bird watching
1	1			dining
1			1	flyng
1			1	golf
2		1	1	snow shoeing

6 How many of the following types of recreational equipment are used at your property?

(197 answered; 10 left this section blank either because they have no equipment or because they chose not to respond)

(66 respondents checked the equipment, but did not put a count)

121	canoes or kayaks	33	jet skis	81	snowmobile
81	rowboats or paddle boats	95	motorboats (less than 75 hp)	61	cross-country skis
18	sailboats or sailboards	107	motorboats (75 hp or more)	94	pontoon boats

(these are not a count of the number of pieces of that equipment, but of the number of responses (either by count or a check mark) to that piece of equipment)

7 When you use other lakes or rivers in the area, which do you use?

(117 answered)

4	Atkins	1	Flambeau	1	Patsy
1	Beaver L.	11	Garden	1	Perry L.
6	Brule R.	8	Jackson L.	2	Porcupine
4	Cable L.	2	Lost Land L.	1	Rock
1	Chippewa L.	1	Manitawish Chain, Vilas	2	Round L.
4	Chippewa R.	5	Marengo R.	1	Spider L.
3	Clam L.	1	McCloud	1	Spyder
1	Cranberry L.	1	Minocqua L.	13	Superior L.
11	Crystal	1	Mississippi R.	2	Tahkoda L.
3	Day L.	12	Namakagon	1	Teal R.
1	Dekota	6	Namakagon L.	1	Three Lakes Cham
9	Diamond	45	Namakagon R.	1	Togotic L.
1	Eau Claire Fades	2	Nelson L.	1	Twin Lakes
1	Eau Claire Lake, Middle	23	Owen L.	5	White R.

8 How often do you use these lakes and rivers?

(116 answered)

66	once every year or two	110	1 to 10 times / year	22	more than 10 times / year
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**Namakagon Lake Association
Lake Use and Opinion Survey**

9 From the letters in question 4, please pick the top 2 activities for each lake or river

(104 answered)

53	boating	2	picnicking	21	peace and solitude
39	canoeing/kayaking	98	fishing/ice fishing	27	scenic enjoyment
1	sailing	22	wildlife observation	8	hunting
1	personal watercraft	9	swimming	15	snowmobiling
2	entertaining friends	2	hiking		

10 How important are the following attributes in your decision to use area lakes and rivers?

(174 answered)

<u>not at all important</u>	<u>not too important</u>	<u>somewhat important</u>	<u>very important</u>		
31	37	58	30	distance from home	<i>(156 answered)</i>
18	18	62	65	quality of fishing	<i>(163 answered)</i>
6	23	61	74	water clarity	<i>(164 answered)</i>
6	22	62	67	amount of aquatic weeds	<i>(157 answered)</i>
4	3	42	117	scenic quality	<i>(166 answered)</i>
3	20	86	53	low # of other users	<i>(162 answered)</i>
6	21	58	80	natural lakeshore	<i>(165 answered)</i>
24	39	37	60	person/family tradition	<i>(160 answered)</i>
				other	<i>(11 answered)</i>
				ATV/snowmobile trail system	
				community; friends; gathering	
				non-use of jet skis	
				number/variety of birds	
				peaceful, quiet	
				resorts & amenities	
				shoreline variety	

11 Which of the following best describes the situation where your property meets the lake? (Please check the one that best applies.)

(203 answered)

(24 respondents checked more than one box)

2	Masonry/concrete retaining wall	49	Rock/riprap added for stabilization
38	Lawn	14	Landscaped trees and shrubs
1	Wood retaining wall	133	Undeveloped, natural landscape

12 Which of the following describes the landscape between the shoreline up to the edge of your home? (Check all that apply.)

(200 answered)

124	Lawn	8	Retaining wall(s) or terraces
46	Landscaped trees and shrubs	13	Rock gardens or masonry areas
117	Undeveloped, natural landscape	6	Sand/developed beach

13 How long have you lived on or visited this property?

(185 answered)

22.4	Years	average of responses						
	20	0 - 5	10	26 - 30	4	51 - 55	1	76 - 80
	33	6 - 10	14	31 - 35	3	56 - 60		Other
	20	11 - 15	17	36 - 40	3	61 - 65	2	>15
	32	16 - 20	3	41 - 45	1	66 - 70	2	>50
	15	21 - 25	3	46 - 50	1	71 - 75	1	55-60

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14 Please tell us what structures, if any, exist on your property

(205 answered)

- 164 Winterized house
- 24 Boathouse
- 154 Private dock/pier
- 18 Association dock/pier
- 23 Non-Winterized Cottage
- 124 Detached garage/shed
- 21 Other (Please List): _____
 - 1 attached garage
 - 1 bunkhouse (winterized)
 - 2 cabin (incl. log, part-winterized)
 - 3 condo
 - 2 fish cleaning house
 - 1 guest cottage (winterized)
 - 1 kids playhouse
 - 1 outhouse
 - 1 pool
 - 1 sauna
 - 5 shed (incl. garden, storage, wood)
 - 1 trailer
 - 1 work shop
- 7 No Structures exist on my property

15 Does your property have any of the following? (Please check all that apply.)

(175 answered)

- 55 Landscaped vegetation barrier that runoff water must flow through before leaving the property or entering the lake.
- 156 Undeveloped natural vegetation barrier that runoff water must flow through before it leaves the property or enters the lake.
- 11 Grass drainage ditch to divert runoff water away from the home?
- 22 Drainage tile.
- 0 Storm sewer inlet on your property or along any of its borders.

16 Do you own undeveloped lakeshore property on this lake?

(175 answered)

- 152 No
- 49 Yes **would you ever consider placing your undeveloped lakeshore property in a type of conservation easement* or some other type of land trust that would protect it from development?**
 - 30 No
 - 10 Yes
 - 12 Yes, but only if financial incentives are also offered**if so, which of the following might you use to protect your property?**
 - 14 conservation easement*
 - 8 land trust*
 - 3 other
 - have conservation easement on property
 - property on lake is enrolled in managed forest law program
 - not sure

17 Which term best defines the overall water "quality" of this lake? (Please check only one.)

(204 answered)

- 0 seriously polluted
- 2 poor
- 13 fair
- 97 good
- 84 very good / not polluted
- 8 don't know

18 Which best describes the fishery of this lake? (Please check only one.)

(205 answered)

- 12 very poor
- 11 poor
- 62 fair
- 91 good
- 13 very good
- 16 don't know

Namakagon Lake Association
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19 Which term best defines the water "clarity" of this lake in the summer months of July and August? (Please check only one.)

(198 answered)

- 13 murky
- 86 cloudy
- 94 clear
- 3 crystal clear
- 2 don't know

20 Do you notice a change in water clarity as the summer progresses?

(198 answered)

- 123 yes, water becomes more cloudy
- 3 yes, water becomes more clear
- 70 no, water clarity stays about the same

21 How would you rate the tranquility and peace at this lake as measured by awareness of other people? (Please check only one.)

(203 answered)

- 0 unusable (too much noise and activity to enjoy the lake)
- 2 over-use (excessive noise and activities of others)
- 53 occasional over-use (some disturbance of my enjoyment)
- 135 moderate use (easy to share lake with others)
- 13 few disturbances (rarely see/hear others)

22 How has the quality of your experience here changed since you first became familiar with this lake? (Please check only one.)

(203 answered)

- 5 considerably degraded
- 24 degraded
- 149 remained about the same
- 21 improved
- 4 considerably improved

23 To what extent have you noticed the following occur on this lake?

<u>very often</u>	<u>moderately</u>	<u>rarely</u>	<u>haven't noticed</u>	<u>don't know</u>	
23	97	32	39		Algal blooms (191 answered)
24	87	54	30		Excessive lake weeds (195 answered)
11	31	66	73		Sedimentation (181 answered)
11	75	76	27		Large fluctuations in water levels (189 answered)
3	19	84	78		Erosion (184 answered)
0	4	62	118	1	Fish kills (185 answered)
3	4	61	117	1	Unusual water smell or coloration (186 answered)
0	3	30	150	2	Failing septic systems (185 answered)
6	43	78	62		Decreased water clarity (189 answered)

24 Do you feel the amount of aquatic plants in the lake is:

(196 answered)

- 40 too much
- 152 just right
- 1 too little
- 3 Don't Know

25 Would you like to see more native aquatic plant species in the lake?

(202 answered)

- 42 definitely no
- 55 probably no
- 81 unsure
- 20 probably yes
- 4 definitely yes

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26 How much, if at all, do you think each of the following are causing water quality problems for your lake?
(Please check x only one for each lettered item.)

(203 answered)

(not all answered for each item)

major cause	moderate cause	not a cause	don't know	
19	66	53	64	fertilizers / pesticides
5	20	89	86	improper disposal of household chemicals, etc
11	47	47	97	septic systems
8	34	52	107	introduction of exotic species
3	23	103	74	erosion from construction sites
1	45	93	63	yard / grass clippings
4	43	93	61	stormwater from streets, highways, etc
2	32	98	71	stormwater from house roofs, driveways
7	65	62	68	accidental spills from boats
24	75	54	50	replacing natural shoreline

27 Of all of the items listed above in Question 26, which two do you feel contribute most to water quality problems in your lake?

(156 answered)

63	fertilizers / pesticides
3	improper disposal of household chemicals, etc
45	septic systems
31	introduction of exotic species
7	erosion from construction sites
12	yard / grass clippings
18	stormwater from streets, highways, etc
8	stormwater from house roofs, driveways
37	accidental spills from boats
70	replacing natural shoreline
1	acid rain

28 To what extent are the following actions needed to deal with your concerns for the lake? (Please check the one that best applies for each or leave blank if does not apply)

(203 answered)

(not all answered for each item)

not needed	little need	moderate need	very needed	
56	63	60	10	develop better boat safety programs (189)
82	81	21	1	develop better swimming safety programs (185)
10	25	98	66	stock fish (199)
18	33	94	51	develop a weed survey / control program (196)
45	64	53	35	use regulation to control boat wake (197)
91	50	40	13	use regulation to control motor size (194)
59	58	56	24	develop stronger zoning for lake development (197)
22	25	98	54	promote education concerning the use of lawn/garden pesticides (199)
23	51	68	54	enforce current zoning ordinances (196)
93	56	18	32	reduce the number of public access points on this lake (boat launches) (199)
43	49	79	29	perform shoreline restoration activities (add native plantings to shorelines to return natural character to lake) (200)

29 Which statement best describes the boat traffic this lake receives? (Please indicate one choice for weekdays and one for weekends)

(202 answered)

(not all answered for each timeframe)

weekdays	weekends	
79	7	lightly used – rarely see another boat
106	136	moderately used – not enough to bother my use
2	46	heavily used – on occasion I have to modify my plans because of boat traffic
1	5	over used – I have to regularly change my plans because of the boat traffic
0	1	unusable – there is so much boat traffic that I don't use the lake very much
7	5	don't know

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30 Which statement best describes your experiences with other boaters while on the water? (Please indicate one choice for weekdays and one for weekends)

*(204 answered)
(not all answered for each timeframe)*

<u>weekdays</u>	<u>weekends</u>	
135	82	no problem – boaters have been courteous and law abiding
52	99	little problem – a few boaters have been discourteous and broken rules
3	9	moderate problem – a significant number of boaters intimidate other boaters
0	3	significant problem – some boaters intimidate and harass other boaters
0	0	excessive problem – I have generally quit boating because of the behavior of other boaters
8	7	don't know – I do not use the lake for boating

31 Please indicate how aware you are of the requirements of the current Bayfield County shoreland zoning

(204 answered)

<u>not at all</u>	<u>not too aware</u>	<u>somewhat</u>	<u>very aware</u>	
18	4	26	156	minimum set back of 75 ft on lakes
40	28	48	87	removal of only 30 ft of vegetation for every 100 ft of shoreline to a depth of 35 ft inland
38	26	47	93	permit requirements for shoreline fill or grade below ordinary high water mark
54	45	49	53	permit requirement to fill grade within 300 ft of shoreline in some areas draining to lake depending on slope and amount of fill or grade

32 Would you favor changing these regulations to be even more restrictive to further protect shorelands?

(203 answered)

156	no	
41	yes	using the letters in question 31 please indicate which requirements you would support making more restrictive
		23 minimum set back of 75 ft on lakes
		29 removal of only 30 ft of vegetation for every 100 ft of shoreline to a depth of 35 ft inland
		25 permit requirements for shoreline fill or grade below ordinary high water mark
		27 permit requirement to fill grade within 300 ft of shoreline in some areas draining to lake depending on slope and amount of fill or grade
2	don't know	

33 For each well on your property (up to two), please put one check in the answer category that best describes the well. Well #1 should be your primary well.

Well #1 *(185 answered some parts of this question)*

Well #2 *(185 answered some parts of this question)*

Type of Well

182	household drinking well
0	barnyard/livestock well
0	combination well (house & barn)
1	field well
0	irrigation well

12	household drinking well
0	barnyard/livestock well
0	combination well (house & barn)
0	field well
0	irrigation well

Year Last Tested

6	2010	3	2003	2	2010	0	2003
25	2009	6	2002	3	2009	0	2002
16	2008	1	2001	2	2008	0	2001
7	2007	7	2000	0	2007	0	2000
8	2006	31	before 2000	0	2006	0	before 2000
3	2005	9	never	0	2005	2	never
7	2004	45	don't know	1	2004	2	don't know

What did you Test this Well #1 for? (check all that apply) *(74 answered)*

74	bacteria	6	bacteria
64	nitrate	6	nitrate
51	lead	5	lead
44	pesticides	5	pesticides

**Namakagon Lake Association
Lake Use and Opinion Survey**

How is this Well Protected at the Surface? (check all that apply) (179 answered)

138	sealed well cap	7	sealed well cap
11	wellhouse / shed	2	wellhouse / shed
9	concrete pad / slab	3	concrete pad / slab
8	covered pit	0	covered pit
21	well in basement	1	well in basement
3	other	0	other

How was this Well Constructed? (180 answered)

93	drilled	7	drilled
37	driven point	2	driven point
0	dug	0	dug
1	bored	0	bored
50	don't know	3	don't know
0	other	0	other

In what Year was Your Well Constructed, approximately?

2	before 1950	15	1980-89	0	before 1950	1	1980-89
5	1950-59	26	1990-99	0	1950-59	4	1990-99
6	1960-69	42	2000-09	1	1960-69	2	2000-09
23	1970-79	64	don't know	0	1970-79	5	don't know

About how Deep is your Well?

35	less than 50 feet	3	140-169	5	less than 50 feet	0	140-169
17	50-79	2	200-250	0	50-79	0	200-250
13	80-109	2	251-300	2	80-109	0	251-300
2	110-139	102	don't know	0	110-139	5	don't know

34 What type of septic system do you use at this lake residence? (Please check x only one.)

(190 answered)

(several had multiple systems)

37	Holding tank
151	Septic tank/drain field
6	Privy/outhouse

35 Which of the following categories best describes the age of your septic system? (Please check only one.)

(186 answered)

(one had multiple checks)

29	less than 5 years old
40	6 - 10 years old
30	11 - 15 years old
43	16 - 25 years old
27	more than 25 years old
17	don't know

36 On average, how often is this system pumped? Every:

(176 answered)

(one had multiple answer)

14	more than once a year	8	5 yrs
22	once a year	1	4-5 yrs
1	1 1/2 yrs	2	6 yrs
32	2 yrs	3	10 yrs
81	3 yrs	2	as needed
2	2-3 yrs	2	don't know
6	4 yrs	1	to be determined

In what year was your septic system last inspected by a qualified professional? (161 answered)

3	1995 - 1999
11	2000 - 2004
94	2005 - 2009
37	2010
13	don't know
1	none
2	not applicable

Namakagon Lake Association
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Were any deficiencies or code violations observed? (164 answered)

3 yes
161 no

Do you have plans to update your on-site waste water system in the next 5 years? (176 answered)

7 yes
168 no
1 don't know

37 Please estimate the distance and location of your sanitary system (holding tank or drain field) from the well you use most for household and drinking purposes.

The shortest distance between the household/drinking well and the holding tank or drain field (181 answered)

1 within 10 feet
50 10 - 50 feet
78 51 - 100 feet
52 beyond 100 feet

The household/drinking well is located: (143 answered)

45 uphill from the holding tank/drain field
26 downhill from the holding tank/drain field
72 level with the holding tank/drain field

38 Do you maintain a lawn at this property?

(204 answered)

28 no
176 yes

39 On average, how often do you mow your lawn during the summer months?

(184 answered)

(2 answered twice)

4 about twice a week
53 about once a week
51 about once every two weeks
74 no pattern, just when I think it needs it

40 Do you remove clippings from the lawn?

(141 answered)

(several answered both or neither, yet answered follow on questions)

133 no
13 yes

If no, do you use a mulching lawn mower?

60 no
80 yes
16 not sure

If yes, what do you do with those clippings?

0 burn them
4 compost - community pile
0 dispose along river bank or in water
17 compost - bin or pile on my property
8 compost - mulch on garden or plants
4 other (please specify):
1 depends on time of year
2 leave on grass
1 throw in woods

41 Do you use pesticides on your lake property lawn?

(180 answered)

158 no
22 yes

42 On average, how often are pesticides applied to this lawn?

(25 answered)

19	Spring (before June)	13 1/yr	1 every 4 yrs	1 x
		1 every 2 yrs	3 0 times	
13	Summer (June-August)	8 1/yr	3 0 times	
		1 1 to 2/yr	1 when find ant hills	
12	Fall (after August)	6 1/yr	4 0 times	
		1 twice/yr	1 x	

Who applies the pesticides? *(23 answered, 1 multiple)*

19	myself or family member
2	hire a lawn company
3	someone else

43 Are fertilizers and pesticides applied at the same time in a weed-and-feed mixture (one application of both fertilizer and herbicide)?

(55 answered)

32	no
18	yes
5	not sure

44 What is your current age?

(201 answered)

ages ranged from 38 to 92

3	30's
16	40's
68	50's
62	60's
40	70's
6	80's
1	90's
3	other
	>65
	50+
	NA

45 Do you belong to a lake association?

(204 answered)

66	no
138	yes
	2 Eagle Point
	2 Garmisch
	1 Gull Area Lake Assoc
	3 Lake Woods Homeowners Assoc
	3 Missionary Pt Assoc
	116 Namakagon Lake Assoc
	1 NC / Namakagon

Namakagon Lake Association
Lake Use and Opinion Survey

46 Please rank the following groups according to how much authority they should have in managing this lake? (1 = most authority; if they should have no authority, enter 0.)

(196 answered in some manner)

(this was a confusing question to respondents. 89 used the anticipated ranking of 1 to 8 method, 107 used a 0 and 1 X system to 'rank')

Local residents

	those that ranked		those that used 1/0
35	1	90	"1/X"
13	2	5	"0"
7	3	1	"0.5"
7	4		
7	5		
2	6		
7	7		
1	8		

County government

	those that ranked		those that used 1/0
15	1	48	"1"
9	2	31	"0"
16	3	1	"0.5"
10	4	1	"?"
12	5		
10	6		
3	7		
0	8		
6	0		

Non-resident users

2	1	19	"1"
8	2	68	"0"
9	3		
1	4		
2	5		
7	6		
11	7		
8	8		
27	0		

State government

6	1	40	"1"
12	2	45	"0"
10	3	1	"0.5"
12	4	1	"?"
11	5	1	"50/50" with lake assoc.
12	6		
10	7		
1	8		
7	0		
1	10		

Local lake association or district

20	1	71	"1"
23	2	19	"0"
13	3	1	"50/50" with state
9	4		
13	5		
5	6		
0	7		
1	8		
2	0		

Federal government

4	1	17	"1"
4	2	71	"0"
5	3		
1	4		
7	5		
7	6		
5	7		
15	8		
30	0		
1	10		

City or Village government

6	1	42	"1"
10	2	36	"0"
19	3	2	"0.5"
18	4		
10	5		
5	6		
2	7		
0	8		
9	0		

Town government

11	1	56	"1"
14	2	25	"0"
19	3	2	"0.5"
16	4		
11	5		
3	6		
2	7		
0	8		
7	0		

Namakagon Lake Association
Lake Use and Opinion Survey

47 From the list below, please check all of the actions which you think should be pursued to protect your lake.

(140 answered)

- 57 Form a lake district with authority to develop and enforce ordinances and collect fees to be used to protect and maintain the resource and watershed
- 87 Better enforcement of current zoning codes
- 22 Enact stricter zoning regulations
- 70 Better enforcement of current boating and water recreation laws
- 23 Enact stricter boating or water recreational use ordinances than presently exist
- 77 Restore the shoreline and improve habitat around the lake shoreline
- 51 Designate hours of operation for different lake users (e.g., jet skiers, fisherpersons, etc.)
- 26 Designate areas of operation for different lake users (e.g., jet skiers, fisherpersons, etc.)
- 21 Other: *(some listed multiple actions)*
 - 1 all users of lakes should use a bit more common sense
 - 1 allow over water boathouses (like Mary Burke) under strict construction regulation
 - 3 ban/limit use jet ski and/or ATV use
 - 2 better education (zoning laws & landowners usage of pesticides, septic systems, boats, riparian rights/responsibilities)
 - 3 continue to enforce weed removal from boats, strict monitoring of boat landings to prevent harmful aquatic species spread
 - 1 monitoring of compliance of septic systems with remedial action on noncomplying systems
 - 1 current zoning & regs are adequate & enforced
 - 2 fewer public landings/launch ramp
 - 1 periodically offer safe boating classes on the Coast Guard Rules of the Road, especially for new boat owners and young boat drivers

 - 1 raise the dam flowage, too much water is lost, lake becomes 2-3' lower by July
 - 2 stop Native American spear fishing
 - 1 we have an association
 - 3 don't know
- 49 No actions should be taken

48 From the actions listed in question 47, which two do you believe are the most important to protect your lake?
Place the letter of the corresponding actions in the spaces below.

- 42 Form a lake district with authority to develop and enforce ordinances and collect fees to be used to protect and maintain the resource and watershed
- 62 Better enforcement of current zoning codes
- 8 Enact stricter zoning regulations
- 34 Better enforcement of current boating and water recreation laws
- 5 Enact stricter boating or water recreational use ordinances than presently exist
- 50 Restore the shoreline and improve habitat around the lake shoreline
- 18 Designate hours of operation for different lake users (e.g., jet skiers, fisherpersons, etc.)
- 4 Designate areas of operation for different lake users (e.g., jet skiers, fisherpersons, etc.)
- 15 Other

Namakagon Lake Association
Lake Use and Opinion Survey

Additional Comments

(46, form the "Additional Comments" section or from throughout the questionnaire)

Acid rain - moderate cause of water quality problems. Develop stronger zoning for lake development by changing to a Class 3 from Class 2 lake. Limit the amount of permeable surface in the shoreland zoning ordinance.

Authority rank 1 - taxpayers on the lake

Better enforcement of snowmobile laws

CBCW Slow wake to protect shoreline

Condo owner Lakewoods Villages

DNR needs to control the wolf population, they are too hard on the wildlife. Deer population is way down since the wolf population increased. Also the few turkeys that we are starting to get will also be in danger along with the grouse.

Do not see any problems with current lake use. Think DNR is sometimes too restrictive to things like location of buildings near lake, we understand septic rules but once it is our property we should be able to add onto cabin if wanted. Pesticide use etc. should be controlled but it seems like there are more rules and fees constantly being applied with a few people making rules for everyone!

Don't over regulate the lake - we know from current D.C. leaders how ineffective govt. is!! PS (I didn't vote for him!)

Enforce existing laws

Enough in place now. Government is too intrusive & expensive.

Enough restrictions and taxes! Quit wasting money. Enforce current law, no need for new ones. Let people tear down junk and rebuild better on same footprint. Don't tread on me! Leave us alone! I can't use many lakes/rivers anymore - they are closed to access.

Envelope was not stamped as indicated in cover letter

Even though I don't use property, I value canoeing, picnicking, wildlife observation, peace/solitude, scenic enjoyment. I did (belong to lake assoc) at one time.

For the most part boaters are safe on Lake Namakagon. Often jet skis are out of control. They are very young and chase behind boat to jump there wakes. I think there need to be more enforcement on how and when these are used. I don't know the age limit but there are very young kids driving these with no understanding of boat safety.

I am against a lake district

I am definitely against the controlling nannies that try to legislate, regulate everything they like/don't like. Most people who own property and pay taxes are anxious to improve their investment if they understand the issue. These are the "stakeholders" in the area, not those who come and use the public boat landings. An active, friendly, helpful lake association is probably the best way to encourage the residents to comply with sensible regulations. The last thing we need is more government, more laws, more bureaucrats trying to justify their existence.

I believe the locals and owners care about our lake. I may not do the sports, but I desire health for all species that use or live on and/or the lake. We do not need an extreme of rules.

I feel the water quality is fine.

I would like to see more enforcement of the no wake zone in the channel between Jackson & Namakagon. I would also like to see a means of education of part time and year-round residents who are not NLA members as to county ordinances and boating regulations, i.e. lakeshore lighting, etc. I would love to see some time and/or speed restrictions on this lake. Waterskiing/jet skiing after dark and at dusk is not only annoying but dangerous.

Is this survey meant to provide fuel for the environmentalists who would like to have more control over how the taxpayer uses his property? Or is it meant to allow the owner of the property reasonable use considering the taxes we pay? And we are paying to send you these answers! Which may or may not result in action we like! Not good! Don't we already have a weed survey/control program? Water clarity becomes more cloudy from boats pulling rafts and jet ski use. Questions no 'mild choice' for causes of water quality problems.

Lake Namakagon is a large, beautiful underused lake, with islands, bays, wildlife, and a shoreline that is probably 1/3 to 1/2 in its pristine natural state, and likely to remain that way. Education (lists of native plants suitable to zone 3 and how/where to use them, the aforementioned safe boating classes, information concerning the use and safety of pesticides and fertilizers) and helpful suggestions are strongly urged rather than more and stricter laws, rules, and regulations. We have been coming to this lake every summer since 1965, and have witnessed a great increase in the number of loons and eagles during that time. Concurrently, there has been little, if any, increase in boat traffic. So let's try to keep our lake the charming, friendly area that we all enjoy.

Limit water skiing/wave runner hours

Locals don't see the big picture - only act in self interest

Need to help restore shoreline and have a meeting on what a land owner can/can not do. Not necessary to be 30 ft back but to find ways to help cost to rock lake shore. Better enforcement of jet skis, get grant help with restoring shoreline, designate hours of operation for jet skiers.

NLA could be given more authority - Continue efforts to control exotic species - Do not limit use of lake

Own condo at Lakewoods Resort

Namakagon Lake Association
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Quality of experience on lake has degraded because of more powerboat and personal watercraft usage

Regulate boat wake in canal

Restore shoreline where owners agree to have this done Monitor water quality Enhance fishing experience - stock fish

Restrict use of fertilizers, pesticides/herbicides Restore shoreline natural habitats Increase inspection of septic systems with followup enforcement of necessary improvements

Thanks to our NLA They do a great job

The bars attract people that conflicts with the goals of the majority of owners Bar lights are in violation of code snow mobilers break laws daily Bars attract a reckless group of transient people who don't care about the lake in general Actions regarding the snowmobile moise, snowmobile speed, and intoicated snowmobilers are very needed

The DNR, county zoning, town-Corp of Eng, Lake Ass, Land use plans, Comprehensive plans are beginning to stumble over one another We have enough control and restrictions now This questionnaire add to the confusion of what contrls that we do have on this lake. Zoning for lake is excessive now Those that have authroity are using it now (ranking groups)

The envelope was not "stamped"

The lack of water during drought periods contributes the most to water quality problems Current laws and zoning are enough

The survey seems biased toward limited use of the lake For example asking about boat use should include how many boats do you usually see It is Sunday PM on Namakagon and I don't see a boat

The weeds are so thick we can not get our boat in & out frOm the docks without help! The algae is terrible and so is the green pea soup water No one seems to care about Jackson A big no to stricter/more regulations

This survey is poorly constructed and slanted towards more regulation and control I know it will be quoted in the future to justify increased regulation and spending or tax increase

Too much government intervention now

Town government should give more credence to, or follow recommendations of, our Comprehensive Plan Commission/Committee and Bayfield County Lakes Forum.

Walleye fishing terrible (rest illegible)

Water quality excellent Fewer launch ramps

We are very satisfied with the current level of regulations, restrictions, laws, and enforcement on Lake Namakagon It is a beautiful place Please do not change a thing!

We have a good boat safety program The authority ranking question is not clear - how to rank - sometiess federal statutes are required to protect waters. Designate hours/areas of operation for different lake users only if needed.

We have enough rules & codes

We need new, fair, honest game wardens It is my understanding that the DNR does not want erosion into the lake So why are they refusing landowners permits to riprap their shoreline?