



TOWNSHIP OF SEGUIN

Prepared for: Mayor & Council

Department: Community Services

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Subject

Water Quality Monitoring & Septic Re-inspection Program Report

Recommendation

THAT Council receives the Water Quality Monitoring and Septic Re-inspection Program report for information.

Purpose of Report

To provide the Council of the Township of Seguin a summary of key findings of the 2012 Water Quality and Septic Re-inspection Program.

Background/Analysis

As an environment first municipality we pride ourselves in environmental planning initiatives and outreach aimed at improving our water quality and ensuring our lakes remain healthy. Seguin's Water Quality Monitoring and Septic Reinspection Programs are aimed at monitoring the ecological health of our lakes, maintaining septic systems and collaborating with our numerous Lake Associations as part of our overall proactive stewardship initiatives. This report will provide an update for the 2012 year for both programs.

Water Quality Program:

The Seguin Lake Water Quality Monitoring Program, developed in 2008, is a field-based program that monitors approximately 120 lakes across Seguin on a rotating basis. The purpose of the Water Quality Monitoring Program is to establish a historical record of water quality parameters so that trends in water quality can be identified.

The Water Quality Monitoring Program measures:

- Spring Phosphorus concentrations (a measure of nutrient enrichment)
- Dissolved Organic Carbon
- Secchi Depth (a measure of water clarity)
- End of summer dissolved oxygen and temperature profiles

Operation:

The Water Quality Monitoring Program consists of two phases, one in May and the other in August. In May, dissolved oxygen testing and secchi disk readings are taken on our specified lakes and water samples are taken and transported to a lab in Dorset to be tested for phosphorous. In August, dissolved oxygen testing and secchi disk testing are completed.

In 2012, 50 lakes were chosen and tested compared to 43 lakes in 2011. The consistent increase in the number of lakes tested per year is a positive step in acquiring more historical data for the program. In fact, the Ministry of the Environment recommends a minimum of two years of phosphorus data to be 95% confident of being with the mean annual concentration of a lake. For our lakes, 56 lakes now have at least two years of monitoring data compared to 47 lakes in 2011, 39 lakes in 2010 and only 28 lakes in 2009. The data collected over time allows us to monitor future sensitivities to phosphorus or potential problems that may arise.

The following summary and recommendations have been received from Hutcheson Environmental.

- A total of 72 of 128 lakes (56%) in Seguin Township have measured spring total phosphorus concentration data and at the conclusion of the 2013 spring monitoring program, at least 65 lakes will each have a minimum of 3 years of data.
- A list of suggested lakes for spring total phosphorus monitoring in 2013 (35 lakes) is provided in Appendix A. If there is time or funding available to sample additional lakes, we have provided a prioritized list of additional lakes.
- Due to the complex lake shape and bathymetry of Horseshoe Lake, we recommend that spring total phosphorus sampling should be conducted at 3 locations in the lake in 2013 to support multi-basin modeling of the lake when the model is revised in 2014.
- August monitoring of dissolved oxygen, temperature, lake depth and Secchi depth has been completed for 68 lakes. These data have been useful to flag shallow lakes, high DOC lakes and lakes that potentially undergo anoxia for refinement of the model in 2014. We recommend that monitoring in 2013 focus on lakes that have not yet been monitored, lakes that have been flagged as potentially developing anoxia in the hypolimnion and lakes that are designated as Lake Trout Lakes by the Ministry of Natural Resources (Appendix A). If additional resources are available, we recommend monitoring lakes with no existing data and we will work with the Township to identify suitable lakes.
- A large percentage of the Seguin Township monitoring lakes potentially have high dissolved organic carbon concentrations that could result in error in model predictions. If additional time or funding is available, we recommend that a subset of lakes be sampled for dissolved organic carbon. HESL will work with Seguin Township to select the most appropriate lakes for additional sampling if this is possible.

Since 2002, 72 of Seguin's 128 lakes have been tested for total phosphorus concentration by either the Seguin Township Monitoring Program or the Lake

Partner Program (in which residents take part in the monitoring process).

Historical data is key to the success of Seguin's Water Quality Monitoring Program. That is, over time, historical data will provide a more accurate reflection of a lakes health and will contribute greatly to lake stewardship within the region. The Ministry of the Environment recommends having a minimum of two years of spring overturn phosphorus data to be 95% confident of being within 20% of the mean annual concentration of a lake. For our lakes, 47 lakes now have at least two years of monitoring data, in comparison to 39 lakes in 2010, and 29 lakes in 2009.

With continued monitoring, approximately half of the Seguin Lakes will have at least 3 years of data by 2014 when a review of our Water Quality Model and Development Capacity will take place. Obtaining this data will also provide the Planning Department a more reliable tool to accurately assess shoreline development capacity.

For more information on the lakes tested in the 2012 year, please review the attached student "Water Quality Program 2012 Year End Report" and the "Hutcheson Environmental 2012" report.

Septic Re-inspection Program:

The Township of Seguin Septic Re-inspection Program is a proactive strategy on the part of the municipality and serves to compliment the Seguin Lake Water Quality Program developed in 2008. The program was implemented in the spring of 2002 and currently is in its 11th year. The program is run in partnership with the North Bay Mattawa Conservation Authority.

In many small and rural communities like Seguin, septic systems are the common method of waste disposal and treatment. If properly designed, installed and maintained, a septic system could service a home for up to twenty years. However, poorly designed, installed or un-maintained systems may pose a threat to the environment and health through inadequately treated waste.

Since the implementation of the program in 2002, our main objective has been to inspect existing sewage disposal systems for malfunction, deterioration, erosion and overall compliance with the Ontario Building Code (OBC).

The goal of the program is to encourage regular maintenance of septic systems to avoid any possible threats to the environment.

Operation:

Throughout June, July and August (first two weeks) our students inspect septic systems throughout Seguin and encourage regular maintenance and proper care of these systems to avoid any possible threats to the environment.

Upon examination of data in conjunction with the North Bay Mattawa Conservation Authority in early 2011, it was found that a number of files required follow up in order to close. The early part of the 2012 reinspection season was spent completing follow ups and entering data while waiting for new files to be pulled.

During the summer of 2012 the following was reported:

- A total of 145 properties were inspected. This included a total of 79 new properties from six different lakes and 76 previously inspected properties where violations were noted.
- Of the 79 inspections
 - 25 properties were found to have deficiencies
 - 21 of the new properties were left OPEN as home owners did not reply to letter or further investigation was necessary
 - A total of 54 properties inspection files were CLOSED as there were no visible violations found on the property
 - 14 of the inspected properties had violation which were remediated and re-inspected before the end of the summer 2012 season.

Overall, the Community Services Department and North Bay Mattawa Conservation Authority have been working together to streamline the Septic Re-inspection program. In the past, all records for re-inspections of Seguin properties have been determined upon the beginning of the students summer program, therefore a considerable amount of time is spent pulling files and waiting. Following the conclusion of inspections in 2012, the students were able to target and identify properties for reinspection in 2013 and submitted a request to NBMCA to pull these files for use in the 2013 year. As such, the students in 2013 will be able to immediately reinspect properties rather than waiting for documents to arrive. This will streamline the program and make it more efficient.

For a the complete year end report, please see the attached "Septic Re-Inspection Program Year End Report 2012"

Policy & Budget Implications

N/A

Conclusion

In conclusion, both the Seguin Water Quality Monitoring Program and the Septic Re-inspection Program are integral components to the Stewardship of our natural resources. Continued monitoring of our lakes will provide important historical data essential to the ongoing assessment of development capacities and the health of our lakes.

Re-inspecting septic systems throughout the municipality will provide an indication of the violations present on residential properties. More importantly, it will provide an educational tool for residents focusing on the importance of maintaining septic systems through stewardship of their own properties.

We look forward to another successful year in 2013.

Respectfully Submitted By:

Kelly Krist **Director of Community Services**

Reviewed By:

Tom Stockie **CAO**

Michele Fraser **CFO**

Attachments

Water Quality Program 2012 Year End Report
Septic Re-Inspection Program 2012 Year End Report
Hutcheson Environmental Water Quality Report 2012

Seguin Township
Water Quality Program
2012 End of Season Report

Scott Askes & Melissa Pope



Introduction

For the last five years, Seguin Township has been spear heading an operation to monitor the water quality for a number of lakes within the township. This year 50 lakes were sampled during the months of May and August. The lakes chosen to be sampled this year were selected by HESL (Hutchinson Environmental Sciences Ltd.) and our Director of Planning. The selected lakes were chosen because of their sensitivity to ecological and developmental changes. These changes, if not monitored could cause detrimental effects on water quality and marine wild life. In May, the selected 50 lakes were sampled and sent off to Dorset Environment Science Centre for laboratory analysis.

Table 1: Lakes For Testing

1. Ten Mile	2. Upper Fry	3. Lower Fry	4. Isabella	5. Duck
6. Diamond	7. Tub	8. Sucker	9. Baby	10. Star
11. Mutton	12. Turtle	13. Cosh	14. Clear	15. Little Whitefish
16. Kingshot	17. Blue	18. McDonald	19. Mirror	20. Draper
21. Little Lake Joseph	22. Rankin	23. Otter	24. Third	25. Second
26. First	27. McNutt	28. Lane	29. Horseshoe	30. Virtue
31. Flaxman	32. Haines	33. Long	34. Faris	35. Maple
36. Sugar	37. McLean	38. Kight	39. Portage	40. Silver
41. Scime	42. Back	43. Pender	44. Yarrow	45. Brennan
46. McKennie	47. Armishaw	48. Neville	49. McGowan	50. Lieback

The samples were then refrigerated and mailed off to Dorsett science institution at the end of the testing session for phosphorous testing. In August dissolved oxygen levels were taken from each of the 50 lakes to determine the amount of plant activity/productivity in each of the lakes.

During the first part of testing a Sechi disc was used to test water clarity. A Sechi disc is a black-and-white patterned disc, which is lowered into the lakes to give a visual reference of water clarity. The depth was recorded at the point in which the Sechi disc was no longer visible. Phosphorous samples were then taken using composite water sampling techniques from the same depth Sechi disc clarity readings. The samples were then filtered, placed in test tubes and later sent via mail to Dorsett science institution for analysis.

The second portion of sampling completed in August consisted of dissolved oxygen testing using a dissolved oxygen meter, and taking readings at one meter intervals. The dissolved oxygen meter is a small handheld device with a probe one the end of a 30 meter cable. It was found that on some of the deeper lakes such as Little Lake Joseph and Otter the 30 meter cable was not long enough to get readings from a depth of one meter from the lakebed. The readings were taken and recorded to a depth of one meter from that of lake floor. All data was sent to

Hutchinson Environmental Sciences Ltd. for analysis. Dissolved oxygen levels above 5 milligrams per litre (mg/l) are considered to be ideal for aquatic life. It was found that the D.O. levels were lowest near the bottom of the lakes. This is expected to be as a result of all of the aerobic decomposition of organic matter, which has settled on the lakebed. Temperature was also recorded in order to keep track of lake temperatures for each lake at roughly the same time of the year.

Analysis

All of the sample collection, and condition recording took place in the months of May and August. The testing completed in May involved the extraction of 2 water samples from each lake, which were then sent to DORSET Environmental Science Centre for phosphorous concentration analysis. Phosphorous samples are taken in the month of May as this is the most active time of the lake mixing process. Mixing of the lakes begin as soon as the ice starts to melt. Once the surface water reaches a temperature of approximately four degrees Celsius the water is in its most dense state. At this point, the surface layer sinks below the cooler levels and forces them upwards. This process is then repeated and is responsible for the mixing effect seen in our lakes. It is important to obtain a sample at this time, and from the deepest point of the lake, as it will give the most uniform and accurate representation of the total phosphorous concentration. Phosphorous is the primary nutrient responsible for algae blooms. Once a body of water has had an algae bloom, the algae decomposes and depletes the oxygen supply. Depletion of oxygen supplies can disrupt entire ecosystems and cause death in any or all aquatic organisms. The lakes were selected using the Lake Modeling Report as prepared by Hutchinson Environmental Sciences Ltd. (HESL), as well as additional input from our Director of Planning and our Director of Community Services.

Dissolved oxygen (D.O.) readings were completed throughout the month of August, which required observations and recordings at each meter mark below the surface until the end of the D.O. probe reaches one meter from the lake bottom. Dissolved oxygen concentration readings are taken at this time of the year as the lake has completed its mixing process and has separated into three distinct layers. This process is known as stratification. Once stratification is completed the lake will be separated into three main layers. The top of these layers is the epilimnion, the middle is known as the metalimnion and the lowest layer is the hypolimnion. Readings were taken throughout the layers in order to get a comprehensive look at the health of the lake. Dissolved oxygen content is measured in either mg/l or percent saturation. Fish and other aquatic life thrive in an oxygen concentration of 5 mg/l, but can survive in as low as 3 mg/l. **All of the data collected was sent off to Hutchinson Environmental for analysis.**

Recommendations

This being the 5th year the water quality program has been in effect it was especially difficult to get an updated contact list of owners who are willing to allow access to the lakes without a public launch. This year it was our goal to further organize and streamline the water quality program in order to increase efficiency. At the end of the season an updated list of property owners willing to allow access to all 50 of the lakes tested this year was compiled in order to aid future students. It is our recommendation that further steps be taken in order to further the organization and efficiency of the program in order to operate at peak efficiency.

Conclusion

This has been a great summer for both of the students Seguin Township has agreed to take on for the 2012 summer season. All of the lakes selected to be tested for the 2012 season were tested as well as additional lakes selected from HESL's suggested list. The success of this past season was as a direct result of all of the Seguin Township residents who cooperated and allowed us access through private property for those lakes in which a public launch was not present. All of the data has been sent to Dorset for analysis. A more detailed report will be sent to the Township in the fall of 2012. This has been an amazing experience for both of us this summer and we thank everyone who had a part in making this an incredible summer. Special thank you to all of the fellow township employees for making us feel so welcome.

Septic Re-Inspection Report Summer 2012



By Melissa Pope and Scott Askes

Introduction

This summer marks the eleventh consecutive and successful season of the Septic Re-Inspection program. The program is run by Seguin Township and the North Bay-Mattawa Conservation Authority and works with the residents of the Township to preserve and maintain the quality of the lakes. As seasonal inspectors, our goal was to follow the objective of the Re-Inspection program, which is to inspect existing septic systems for any problems. These problems include any structural damage, maintenance problems, or anything that could cause systemic malfunctions to the system and/or do damage to our lakes. To do so, we studied the Ontario Building Code standards and spent a few days in the field with full-time inspectors to learn what is, and what is not an acceptable septic system.

This year, the program had two new students. We spent the first couple weeks learning about septic systems, inspection procedures, finding permits and the filing system. We had to determine which properties we were going to visit this summer and then request for the permits to be retrieved from North Bay. While we waited for the permits to be pulled, we revisited 76 of the files that required a follow-up from previous years. It was beneficial to start with the files that needed a follow-up because it allowed us to understand what the problem was, and how it was reported and taken care of.

The properties that were re-inspected for the first time in this program were properties from Blue Lake, Pender Lake, Three Legged Lake, McNutt Lake (or McNaught's Lake), Kingshott Lake and Hooton Lake. In total, 79 new properties were inspected during this summer season along with 76 properties from previous years that required a follow-up.

Water Body and Inspection Statistics

During the summer of 2012, 79 new properties were inspected from six different lakes. We kept a record from each lake of the number of deficiencies and violations found, and also the type of deficiency. Of the 79 inspections, 25 properties were found to have deficiencies. 21 of the new properties were left OPEN as home owners did not reply to letter or further investigation was necessary. A total of 54 properties inspection files were CLOSED as there were no visible violations found on the property. 14 of the inspected properties had violation which were remediated and re-inspected before the end of the summer 2012 season.

Distribution of site inspections by lake:

Number of Properties Visited; Organised by Lake	
Lake Name	Number of Inspections
Blue	8
Hooton	17
Kingshott	10
McNutt	14
Pender	8
Three Legged	22

Violation types of newly visited properties by lake:

Blue Lake	Privy maintenance, Addition not meeting septic code, Imported sand on septic bed, Cinderblocks on bed
Hooton Lake	Small trees on bed, Sandbox on bed, Fallen tree on bed, Overgrowth
Kingshott Lake	Active Development, Overgrowth, Privy maintenance, Rotten steel tank
McNutt Lake	Overgrowth, Privy maintenance, grey water pit location
Pender Lake	Overgrowth
Three Legged Lake	Grey water runoff, Deck built on tank, Disconnected system,

Challenges Encountered

The number of new inspections completed were much lower than those of previous years. This is as a direct result of the disorganization of the septic re-inspection program. Once we arrived in the Parry Sound offices, a list of roll numbers were sent off to the North Bay Mattawa Conservation Authority (NBMCA) to obtain septic permits. We were told by an employee of the NBMCA that they would pull the required permits and fax them to the Parry Sound office. As we waited, the first few weeks were spent reorganizing all of the re-inspection records from previous years. Many of the files were out of order and without homeowner information, location information, roll numbers and permits. Once all of the file organization was complete, we began to tackle some of the unclosed files from previous years. A total of 76 properties had follow ups conducted and 45 of which could be closed as property owners had complied to requests made by previous inspectors. As these were files open from previous years, the properties were spread all over the township. As a result a lot of time was spent driving from location to location. Unfortunately 31 of the follow up visits conducted were still not in accordance to the Ontario Building Code. Letters were sent to these properties indicating the issues and ordering compliance. Phone calls were also placed to as many of the home owners as possible in order to create open communication. A total of 4 letters were returned to the township indicating a change of address. The GIS system will be checked in the summer of 2013 to search for updated information.

Conclusion

Both of the water quality and septic re-inspection students agree that this has been beneficial for our education as well as the residents of Seguin Township. We would like to suggest that organization of the septic re-inspection program remains a top priority to increase efficiency. In addition we would like to thank all of the employees of Seguin Township and North Bay-Mattawa Conservation Authority, as well as the residents of Seguin Township for making this a productive and enjoyable summer.