HURON-KINLOSS COMMUNITY SEPTIC INSPECTION PROGRAM

Report on the first round of inspections for the Huron-Kinloss Community Septic Inspection program

2007-2014

Huron-Kinloss Community Septic Inspections

TOWNSHIP OF HURON-KINLOSS

HURON-KINLOSS COMMUNITY SEPTIC INSPECTION PROGRAM

CYCLE 1 REPORT

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1.0 Introduction

In 2007, the Township of Huron-Kinloss, initiated the Huron-Kinloss Community Septic Inspection (HKCSI) program. The initiative was developed and implemented as a response to community concerns surrounding local, near shore water quality in Lake Huron.

The Township of Huron-Kinloss is located on the southeastern coast of Lake Huron. There are two urban centres in the Township, Lucknow and Ripley, which have municipal water and wastewater systems. Residences outside of the two villages, and the service area of the Town of Kincardine, are serviced exclusively by private septic systems. Presently, there are 2,975 properties serviced with septic systems in the Township.

The shoreline area of the Township, which generally includes the lands west of Lake Range Drive, is extensively developed for residential use from Amberley Beach, north to the boundary with the Town of Kincardine. There are numerous settlement areas along the lakeshore, including: Point Clark, Blairs Grove, Bruce Beach, Heritage Heights and Kin-Bruce. The remainder of the Township is predominately agricultural lands.

In 1997, a study of continued development along the lakeshore identified the risk associated with the continued use and installation of septic systems and the potential for contamination of beach areas by harmful microorganisms (BMROSS, 1997). Resulting from the study, a surface water quality monitoring program was established in the Point Clark area to evaluate and track levels of E.coli, total phosphorus and nitrates at the beaches. Additional sites were added in later years in an effort to track specific contributing sources of contamination in Jardine Creek.

In the early 2000's, the presence of algal blooms and high bacteria counts, resulting in beach closures, raised concerns about local water quality. Another water quality sampling program was initiated, this time for the Pine River watershed, which encompasses a large area of the Township. This sampling program established a baseline for three water quality parameters: E.coli, total phosphorus and nitrates at 33 sites throughout the Township.

The water quality programs established a database of water quality information, which generally identified levels of *E.coli*, phosphorus and nitrates exceeding Provincial Water Quality Objectives in local waterways. In conjunction with growing public concern regarding algal blooms and beach closures, and discussions with local beach association groups, the Township began investigating a septic system inspection program.

1.0 INTRODUCTION

1.1 PROGRAM INITIATION

The Ontario Building Code Act (1992) and Building Code (Ontario Regulation 350/06) regulate the design, construction and renovation of on-site, private wastewater treatment systems with design capacities of less than 10,000 litres/day. The enforcement of Part 8 of the Building Code, which details the regulations for private sewage systems, is the responsibility of principal authorities such as municipalities or the local health boards. Under Part 8 of the Building Code, private on-site sewage systems include greywater systems, cesspools, privies, leaching bed systems, tertiary systems and holding tanks.

To address surface and groundwater quality and concerns regarding the potential of impacts from septic systems, the Township with assistance from B. M. Ross and Associates (BMROSS), began investigating the requirements for septic system maintenance within the framework of the Building Code Act and its regulations. It was determined that Section 15 of the Building Code Act, gives building officials and inspectors the authority to enter onto private property for the purposes of inspecting a building or sewage system to determine whether the building or sewage system is unsafe. Relating specifically to sewage systems, Section 15.9 (3) of the Building Code Act states: "a sewage system is unsafe if it is not maintained or operated in accordance with the Act and the building code". From these requirements of the Building Code, it was determined a septic system inspection program could be instituted to identify whether systems in the Township are being properly maintained and operated.

With the intent of developing a septic inspection program that would complement the existing water quality monitoring efforts, the Township contracted BMROSS for design and administration of the program. At the time, it was estimated that there were approximately 2,700 septic systems in the municipality and that it would take 8 to 9 years to complete inspections for every system. A program was designed with an approach based on first inspecting systems in high risk areas, as determined by local environmental conditions (e.g. soil types, proximity to surface or groundwater) and the suspected relative age of the systems.

In 2007, the Grey-Bruce Health Unit administered Part 8 of the Building Code for the Township. For the septic inspection program, the Township entered into an agreement with the Grey-Bruce Health Unit to conduct the inspections and any required follow-up visits. BMROSS agreed to manage the program, including development and maintenance of a database, delivery of educational components, identifying target areas and the production of inspection reports.

From the authority given by the Building Code, the Township passed By-law 2007-33 on April 16, 2007, implementing a sewage system re-inspection program (the Huron-Kinloss Community

1.0 INTRODUCTION

Septic (HKCSI) program) across the entire municipality. The by-law states the intent of the program is to "identify and resolve hazards associated with malfunctioning sewage systems" and to raise awareness and provide education regarding proper maintenance and operation of sewage systems. Additionally, the long-term goals of monitoring sewage systems and preventing surface and groundwater contamination are outlined in the bylaw.

Funding for the program is based on a user-pay system. In 2007, the cost of an inspection was estimated at $430 per property with a septic system. To reduce the financial impact to property owners, the cost of the inspection was charged as a flat rate of $55 per year, per property on the tax bill. The fee structure and application of fees, as authorized by Section 391 of the Municipal Act, S.O. 2001, is also included in the implementation by-law.

Failure to participate in the program may result in an Order for an inspection issued against the property. The Township can also place a lien on the property to recover costs associated with issuing an order. Given that sewage systems are considered structure, under Sentence 15.10.1(2) of the Building Code, an order can be made if the inspector is not permitted to conduct the maintenance inspection as denying permission would be considered a contravention of the Act.

Recent amendments to the Building Code made in 2010, defined the scope and application of sewage system maintenance inspection programs. Prior to these amendments, there were no specific policies relating to inspection programs. The amendments include requirements for mandatory programs, such as those required by Source Protection Plans and under the Lake Simcoe Protection Act, and discretionary programs, such as the HKCSI. The regulations require that, in areas where discretionary programs are in place, all on-site sewage systems must be inspected, and the program must provide inspectors with the authority to inspect all systems.

2.0 Program Structure and Strategy

2.1 PROGRAM STRUCTURE

The HKCSI program is divided into two components: the physical inspections of septic systems in the Township, and the administration of the program.

2.1.1 INSPECTIONS

The inspections must be completed by the program inspector, who is a qualified Part 8 Inspector under the Building Code. Third party inspections are not considered admissible, as the program inspection includes gathering geographical coordinates of system components for inclusion in a Geographic Information System (GIS) database. All types of private sewage systems are required to have an inspection as part of the program. This includes: pit privies, cesspools, greywater systems, leaching bed systems, holding tanks, and tertiary systems.

Inspections are non-invasive, visual inspections of the sewage system. For systems with a septic tank, the lids are uncovered, removed and the interior of the tank is inspected. Systems were required to be pumped-out prior to the inspection. The inspection of the tank examined the overall condition of the tank, liquid and scum lines, and the condition of inflow and outflow baffles, the lid, and any filters. Leaching bed areas are examined for any signs of breakouts, as well as potential problems such as tree roots.

It was strongly recommended that property owners were present for the inspections. From property owners, the inspector gathered information regarding the history of the septic system, water usage, system pumping, and wells on the property. Having property owners present for the inspection also provided the opportunity for the inspector to provide education regarding the operation and maintenance requirements for septic systems, such as annual cleaning of effluent filters.

During the inspection, the location of the septic tank, distribution box, and general area of the leaching bed are mapped using a handheld GPS unit. Any wells located on the property, including decommissioned wells, are also located. The information is added to a GIS database and used to produce a map for each property. The map shows the location of the septic system and any wells relative to existing buildings and other features visible on an aerial photograph of the property.

Each system inspected is assigned a risk rating based on the condition of the system at the time of the inspection. There are six potential risk ratings, summarized in the following table:

Table 2.1 Risk Assessments Assigned to Septic Systems

Risk Assessment	Description
High – Environmental Hazard	Systems that pose an environmental hazard as a result of improper treatment of wastewater. Systems with this rating may show signs of failed or failing leaching beds.
High – Structurally Unsafe	If the structure of a component of septic system is in poor condition and poses an immediate risk. Examples are deteriorated septic tanks, or tanks with corroded lids.
Medium – Age	This rating is assigned to systems over 25 years old, but that are still functioning.
Medium – Minor Repairs Required	If a system requires repairs to baffles, effluent filters or minor repairs to lids.
Medium – Non-Conforming	This rating is applied to systems that do not conform with general building code requirements, but are functioning. This rating may be given to homemade system or systems not installed by a qualified installer.
Low	Systems in good, working condition.

Inspections for the HKCSI program were initially carried out by the Grey-Bruce Health Unit. In 2007, the Health Unit provided Part 8 administration and inspection services in the Township. At that time, the Township entered into an agreement with the Health Unit to also provide a dedicated Part 8 inspector for the HKCSI program. In 2011, the Health Unit informed the Township it would no longer provide Part 8 services or an inspector for the HKCSI program. From 2011 to 2014, a dedicated inspector was provided by BMROSS.

2.1.2 ADMINISTRATION

The administration component of the program includes the development and production of all program materials, information management, correspondence with property owners, and quality management. BMROSS administers the HKCSI program on behalf of the Township.

For the purposes of the program, the Township was divided into target areas. These areas, as shown in Figure 2.1, were identified based on a number of characteristics, including the number of properties requiring inspections, general location (e.g. lakeshore or rural), areas identified in the 1997 study, and the presence of distinct communities (e.g. Kinlough and Whitechurch). Certain target areas were prioritized earlier in the program than others based on the suspected ages of systems, local soil conditions, usage (seasonal vs permanent), and location.

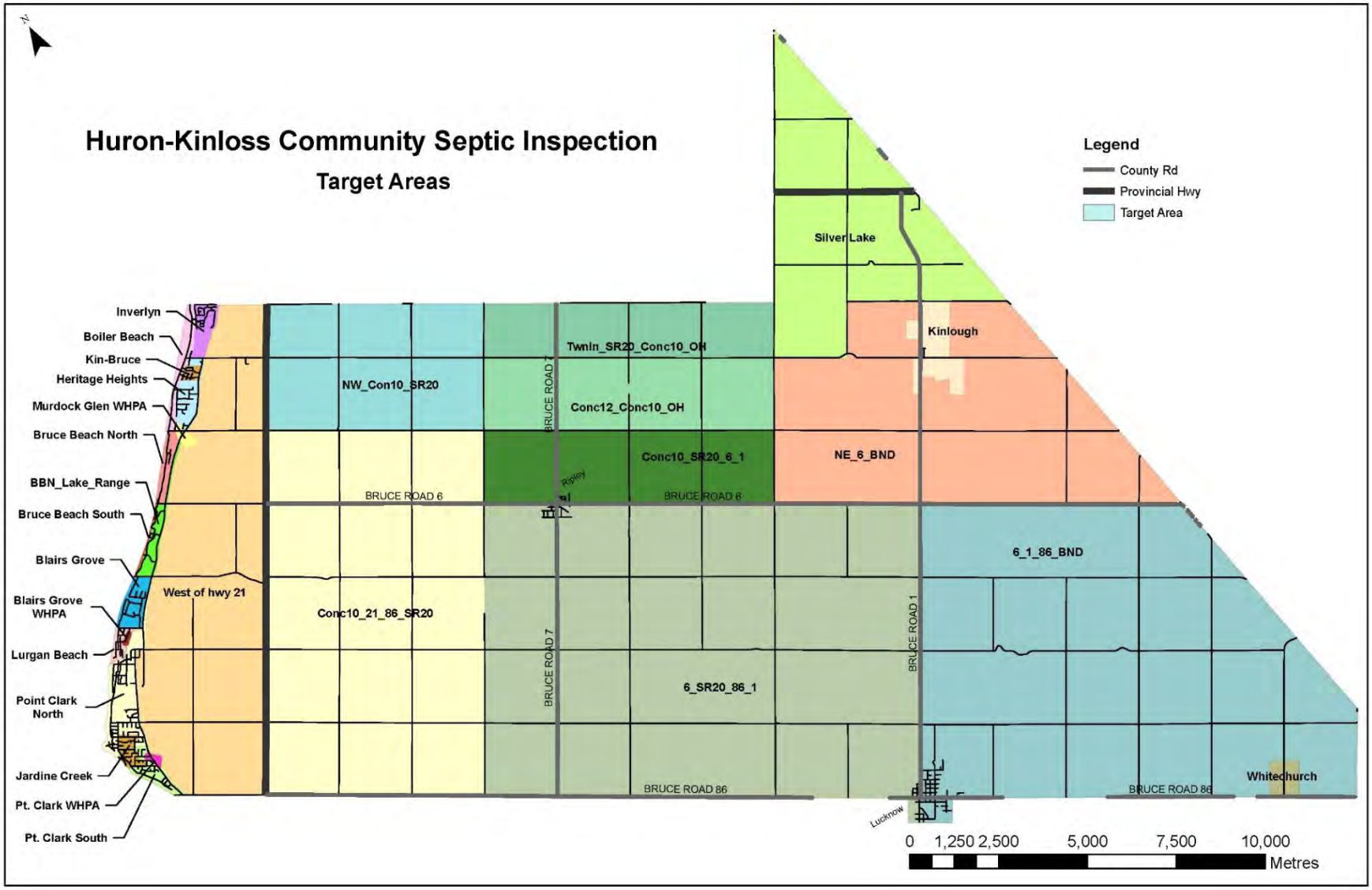


Figure 2.1 Target Area

2.0 PROGRAM STRUCTURE AND STRATEGY

A significant requirement of the program is information management. In order to manage the information related to sewage systems for every property in the Township, an extensive database was created. This database is linked to a geodatabase, which stores the spatial information gathered during the inspections. In addition to sewage system information and the mapping data, the database also stores parcel data for each lot, as well as a record of correspondence including any follow up requirements from the inspection such as repairs.

Following an inspection, the property owner receives a report summarizing the findings of the inspections. If repairs to the system are required, the report includes a form outlining the required work and procedure for reporting when the repairs have been made. Included with the report is an aerial photo of the property showing the location of the septic system components and any wells. If available, copies of original permits are also included with the inspection report. The report is packaged in a folder that provides basic information on septic systems as well as an area to record maintenance information, such as pump-out dates. Also included in the inspection package is educational material about septic systems, their operation and maintenance. The inspection packages are intended to be used as a reference for property owners and to be passed on to new owners.

All correspondence with property owners is documented and stored in the database. This includes initial letters informing property owners of the program, as well as any follow up communication by telephone, additional letters or any other form of contact. Contact with respect to required repairs is also documented. Appointments for inspections are made through the Township office, which allows staff to maintain a role in the program.

2.2 STRATEGY AND APPROACH

The HKCSI program is mandatory for all property owners with a private on-site sewage system; however, voluntary participation is encouraged. To achieve community acceptance and participation, the program marketing strategies and materials were designed around the ideologies of Community Based Social Marketing (CBSM).

CBSM links the findings of research in the fields of social science and social marketing, with the intent of changing attitudes to achieve a desired behavior. In the case of the HKCSI program, the desired behavior is ongoing septic system maintenance. The approach used in CBSM involves identifying barriers and benefits associated with the desired behavior and designing marketing strategies to address the barriers and promote the benefits. Another key component of social marketing is re-establishing social norms to encourage community support and participation.

2.0 PROGRAM STRUCTURE AND STRATEGY

2.3 STRATEGIES EMPLOYED

2.3.1 LETTERS

The initial form of contact with property owners is a letter informing them that they are within an area being targeted for inspections. The intent of the letter is to provide information on the program and encourage participation. The letter outlines the steps required to complete an inspection, including the requirement for a pump-out, having lids cleared and accessible, and calling the Township office to book an appointment time. Additionally, the letter provides the overarching goal of the program, to encouraging regular maintenance of septic systems to keep systems working and reduce impacts to the environment. It also explains how the program is funded, in an effort to minimize the impact of cost as a potential barrier to participation. A brief description of the inspection process is provided to assure residents that the inspection is non-invasive and non-destructive to their property.

To encourage participation, the letter indicates how many other residents have participated in the program to date. Sources of additional information, such as the Township and program websites are provided in the letter. Each letter is branded with the HKCSI logo, as well as the Township and BMROSS logos. The letters are signed by the Chief Building Official, and contact information for the project manager at BMROSS is also provided.

Response to the initial letters sent out was variable across the different target areas. The proportion of property owners who completed inspections in the same year as receiving an initial letter ranged from 0% to 83% across the target areas. Generally, an average of 50% of property owners in a target area completed an inspection after receiving a letter. There was one target area that had no response to the initial letter; however it is suspected that the letter was sent out too late in the year and coincided with harvest activities. The response to the initial letters was generally better along the lakeshore than in the rural target areas.

2.3.2 SEPTIC SOCIALS AND ENVIRONMENTAL DAYS

Between 2007 and 2011 there were 10 demonstrations of the septic inspection process held. These events were marketed as ‘septic socials’, and their purpose was to reduce barriers to participation in the HKCSI program. Septic socials provided an opportunity for residents to see a septic inspection, ask questions, and meet the inspector. Where possible, septic socials were held at a ‘local champion’s’ residence. Local champions were identified as persons who are well known and connected in the community. Beach association presidents and members of Township Council were used as local champions and septic social hosts.

2.0 PROGRAM STRUCTURE AND STRATEGY

Two septic socials were held in the first year of the program. The first septic social was held for property owners in the Jardine Creek target area, at the cottage of the local beach association president. Property owners were mailed an invite to the social with their initial letter. The social was held on a Saturday morning in June, to accommodate the large seasonal population in the target area. The event was attended by approximately 35 residents. Members of the project team, including the inspector, Chief Building Official, and staff from BMROSS were available to answer questions from the public.

Property owners at the Jardine Creek Septic Social, June 2007.

A second septic social was held in the Bruce Beach South target area in July at the residence of a member of the local beach association. Again, the septic social was well received by residents with approximately 40 property owners in attendance.

Inspection demonstration at Lurgan Beach Septic Social, August 2008.

In 2008, following the success of the first two septic socials, another two were held in lakeshore target areas, Bruce Beach North and Lurgan Beach. These septic socials had a similar format to others, with a demonstration of a septic inspections and the opportunity for attendees to ask questions. Approximately 35 property owners attended in the social held at the cottage of the president of the Bruce Beach Cottage Association. The Lurgan Beach septic social was held in August 2008, at the Lurgan Beach/Blairs Grove Beach Association president's home. The Lurgan Beach Septic Social was attended by approximately 25 residents. Fewer inspections were booked in the Lurgan Beach target area in comparison to Bruce Beach North following the septic social. It is suspected the septic social was held too late in the summer season and as a result, seasonal property owners waited until the following year to complete an inspection when it was more convenient.

A septic social for the Point Clark South target area was held in 2009. This septic social was not as well attended as previous events, with approximately a dozen residents in attendance. It is thought the adverse weather (cool and drizzling) affected attendance. Also, absence of a strong community group in the target area may have impacted the success of the septic social.

2.0 PROGRAM STRUCTURE AND STRATEGY

Three septic socials were held in 2010, targeting property owners in Kinloss and Silver Lake, Blairs Grove and Lurgan Beach, and surrounding the Pine River United Church. The septic socials held in the Silver Lake and Blairs Grove target areas were hosted by members of the Township Council. Both of these socials were well attended, especially so in Blairs Grove. There was also local media coverage of the Blairs Grove septic social. Only 10 property owners attended the septic social held in September at the Pine River United Church.

In addition to the septic socials, the Township has held two 'Environmental Days' events. At each of these events, there was a septic inspection demonstration, as well as displays and project team staff present to provide information to the public. These events were held in 2007 and 2011 at the Point Clark Community Centre. The events were held to promote environmental awareness and inform property owners of the ongoing stewardship initiatives within the Township. These events were widely advertised and also included an open-house session with numerous exhibitors, and a guest lecture session. Well attended, these events reached a large audience and were successful in promoting the HKCSI program.

Septic Inspection Demonstration at the 2009 Environmental Day Event

The success and impact of septic socials on the program participation was largely dependent on the community within the target areas and the timing of the event. Generally, septic socials were most successful in generating inspections where the existing communities were relatively tight-knit, such as Blairs Grove, Bruce Beach and Jardine Creek. Many community members in these areas are also members of a local beach association, which allowed residents to share information from the septic socials with those that did not attend. Septic socials in larger target areas, with less cohesive communities, such as Point Clark South, Silver Lake, and the rural target areas around Pine River United Church, were less successful as determined by the number of property owners attending and then completing an inspection.

In terms of addressing the benefits and barriers to participating in the HKCSI program, septic socials were an effective means of reducing property owner apprehension. By providing an opportunity to observe a septic inspection, meet the inspector, and ask questions, the septic socials reduced misconceptions and fears about the inspection process and requirements of the program.

2.3.3 DOORKNOCKERS

Another method of contacting property owners, if they did not respond to the initial letter, and encouraging participation in the program was doorknocking. A doorknocker card, hung off the doorknob, was left at properties where residents were not home at the time of the visit. The doorknocker left behind with property owners featured a picture of the lake; a visual reminder that one of the goals of the program is to reduce the impacts of septic systems on local waterways. Additionally, the doorknocker reminds residents to call the Township to book an appointment for a septic inspection, as well as provide a brief explanation of the program.

Doorknocking efforts occurred in all the target areas between 2008 and 2014, with some properties receiving multiple visits. Initially, BMROSS staff and summer students undertook the doorknocking efforts. If they were able to speak with a property owner, there was a greater likelihood of an inspection being booked. Many of the initial doorknocking efforts took place between Monday and Friday, and relatively few residents were home. Later in the program, especially in the last two years of the first program cycle, the inspector conducted door to door visits to properties that had yet to participate. These visits were more successful in resulting in program participation, as in many cases, the inspector could complete the inspection at the same time as the doorknocking visit.

Visits by the inspector were considered a key method of obtaining participation in the Mennonite community. Generally, doorknocking efforts were more successful in rural areas as opposed to the lakeshore. This is likely due in part to residences in rural areas being occupied more regularly than seasonal residences along the lakeshore. Also, in target areas with a large number of seasonal residences, more renters were encountered, and information was not always passed on to the property owner.

2.3.4 PHONE CALLS

Telephone calls to property owners by project staff were another method utilized to remind residents of the program and encourage them to participate. Calling lists for property owners

were generated from local phone books. Phone numbers for approximately a third of the property owners requiring an inspection, including many seasonal residents and properties owned by numbered companies, could not be found. Members of the Mennonite community were also unreachable by this method of communication.

Property owners were reminded over the telephone of the program and the requirement to complete an inspection. Messages relaying program information were left for owners with answering services. BMROSS staff and summer students, employed by the Township, made the telephone calls. These efforts started in 2010, and were employed extensively between 2012 and 2014, with three to four rounds of telephone calls made each year.

Telephone calls were most successful in encouraging participation in the program when property owners were spoken to directly. Phone calls made in the late afternoon (after 4 PM) and in the evening, were more successful in reaching property owners than calls made during regular, working hours. Generally, telephone calls became more successful in generating inspection towards the end of the program, after property owners had been contacted numerous times.

2.3.5 WEBSITE/BLOG

Information regarding the program is available on the Township website (http://www.huronkinloss.com/septic-systems.cfm) and a program blog (http://hkcsi.blogspot.com). The Township webpage provides extensive information about septic systems and the HKCSI program. Information sheets as well as yearly reports about the HKCSI program are available. The website serves as a repository for information about the program and septic systems in general.

In 2010, an interactive blog was set up for the HKCSI program. The blog was created to provide another platform for property owners to learn about and keep up to date on information about septic systems and the HKCSI program. Posts to the blog cover topics including; statistics on the number of inspections completed, information about program events such as septic socials, videos, pictures and information about septic systems and their maintenance. Visitors are able to leave comments, if desired.

The blog has had 51,178 pages views since its inception in 2010, with most visitors to the site being from Canada. The most popular posts on the blog include: 'Minimum Setback Distances for New Septic Systems', 'Know your Septic System Classes', 'Wet wipes and Your Septic System', and 'Can't Find Your Septic Tank?'

The website and blog provide an opportunity for property owners to obtain additional information about the program; however, these media types require constant updates to ensure the information is current and correct. Producing new material and monitoring comments for the website and blog can also become time consuming, with little impact on participation rates for the program.

2.3.6 INSPECTION FOLDER AND EDUCATION MATERIAL

Property owners who participated in the program received an inspection package, containing their inspection report and an aerial photo of their property with their septic system mapped on it. These materials were packaged in a folder containing fact sheets with additional information on septic systems and their maintenance. The fact sheets included are:

- Appliances and your Septic System
- Septic System Dos & Don'ts
- Landscaping and Your Septic System
- Winter and your Septic Tank
- To Clean or Not to Clean?
- Don'tcha put it down the drain
- Love the tank you're with

The intent of the folder is to serve as a place for property owners to keep records relating to their septic systems and remind them of good, regular maintenance habits, like pumping. A magnet, featuring the program logo, is also included with each inspection package. Residents are also encouraged to leave the inspection package with the home in the event the property is sold.

3.0 Program Statistics

3.1 INSPECTIONS COMPLETED

There are 5,385 properties, as of December 2014, in the Township of Huron-Kinloss. Of these properties, 2,410 are not serviced by private on-site sewage systems. These properties include those that do not require sewage service, such as vacant land and agricultural land, and those that are serviced by municipal sewage collection and treatment systems in Lucknow, Ripley and in the area south of Kincardine. Consequently, there are 2,975, or 55% of properties in the Township, that have some form of on-site sewage system that requires an inspection as part of the HKCSI program. There are 5 systems in Huron-Kinloss with design capacities greater than 10,000 L/day. These are regulated by the Ministry of Environment and Climate Change.

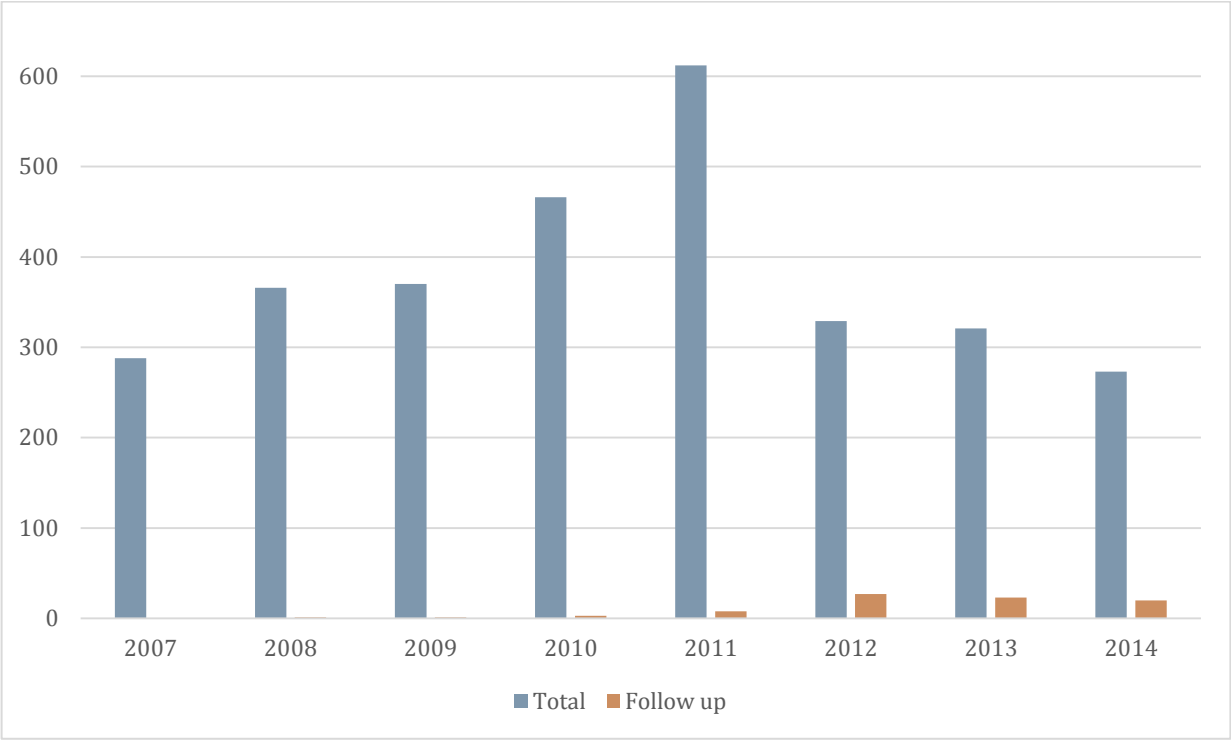
The first round of inspections for the HKCSI program took place between 2007 and 2014. At the end of 2014, 3,023 inspections have been completed (this includes multiple systems on properties and follow up visits). There are 59 properties that have not been inspected, and of these, 5 properties currently have pending sewage system permits. The number of inspections completed per year is shown in the figure below. The number of inspections includes follow up visits to properties when replacement tanks or systems were installed following an initial inspection. Over the 8-year cycle, it was the intent to complete approximately 350 inspections per year.

In the first year of the program, which served as a pilot for marketing strategies to promote the program, there were 288 inspections completed. In the subsequent years, the number of inspections per year rose to a high of 612 in 2011. The high number of inspections completed in 2011 is due in part to the high rate of participation in the Port Clark North target area in its first target year; significantly more residents booked an inspection in 2011, following initial notification in this target area than expected.

Given that the early adopters and early majority of the target population of the program had already participated by 2011, it was expected that the number of inspections would decline in the following years. Significantly more effort was required to encourage property owners to participate between 2012 and 2014. In the last year of the cycle, the property owners who had not participated were mailed final notice letters stating the consequences of not completing and inspection (see Section 1.1). Property owners also received phone calls and doorknocking visits by the inspector to encourage participation in the program. The result of these extensive efforts was 273 inspections in the final year, leaving 54 uninspected properties, including 3 refusals.

3.0 PROGRAM STATISTICS

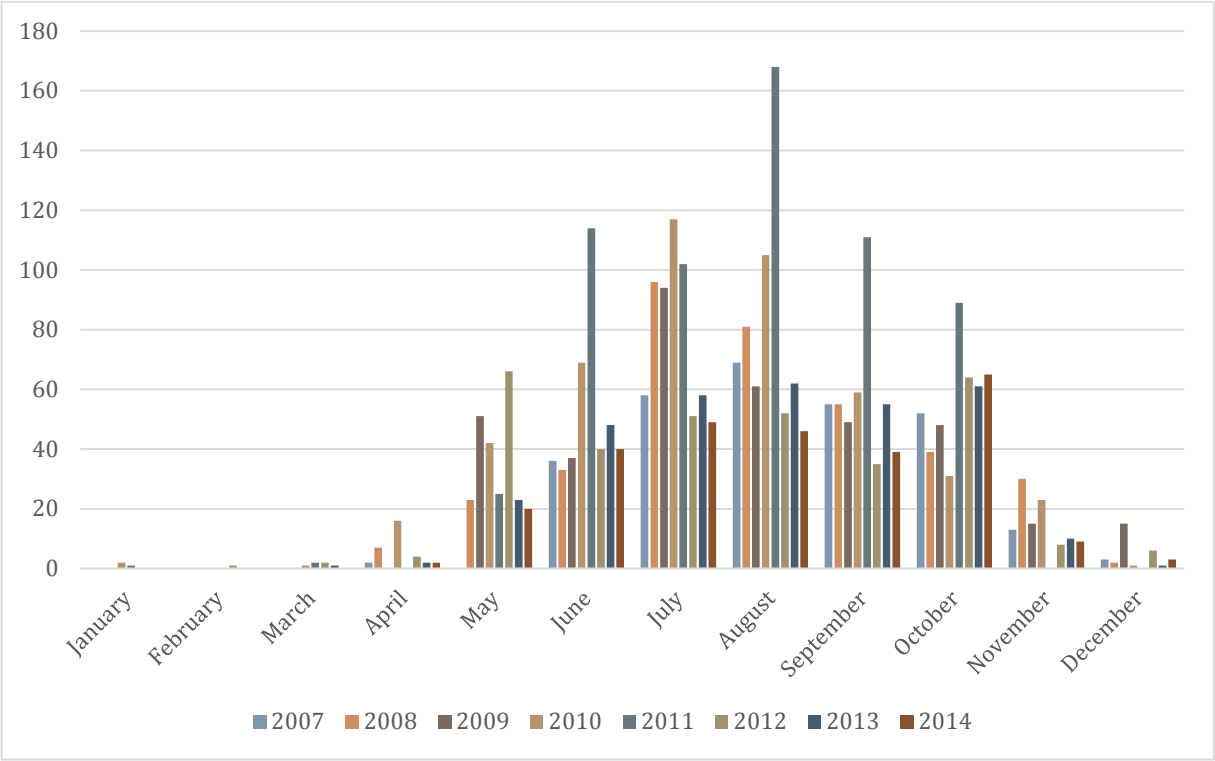
Figure 3.1 Inspections completed as part of the HKCSI program, per year, 2007-2014



Inspections were generally carried out between May and October; however, in certain years, weather conditions permitted inspections in April, November and December as well. In 2009, as a result of the mild conditions, 15 inspections were completed in December. July and August tended to be the busiest month for inspections, averaging approximately 80 inspections per month over the 8-year cycle. This trend is especially pronounced in years where seasonal areas were targeted. Approximately 55 inspections per month were averaged in September and October across the first round of the program. In these months, inspections were typically done on farm properties or as a result of the installation of a new or replacement septic system.

3.0 PROGRAM STATISTICS

Figure 3.2 Inspections completed per month, 2007-2014



3.2 RISK ASSESSMENT

The risk ratings assigned to the inspected septic systems are summarized in Table 3.1. These numbers include instances of multiple systems on a property, with each system assigned a risk rating. The 'No Sewage System' rating refers to properties where the inspector verified no sewage system was present or that the system was decommissioned. Of the sewage systems inspected, over half (52%) were given a low risk rating. There are 1,262 systems (43%) in the Township assessed as medium risk. The majority of medium risk systems identified were given this risk assessment due to their age. Generally, this rating was applied to systems over 25 years old, providing they were functioning appropriately. There were 367 systems found requiring minor repairs and given the rating 'Medium – Minor Repairs Required'. Typically these repairs included repairs to baffles and tank lids. The other 12% of systems given a medium rating were considered non-conforming. Often these systems were identified by the property owner as installed without a permit or were home-made, but still functioned properly. Only 4% of the systems inspected, or 136 systems, were given a high risk rating. Of these systems, 66 were given a high risk rating as they posed an environmental hazard, primarily due to leaching bed failures. There were 70 systems inspected that rated as high risk due to the poor structural condition of either the tank or tank lid.

3.0 PROGRAM STATISTICS

Table 3.1 Risk Assessments of Inspected Systems, 2007-2014

	2007	2008	2009	2010	2011	2012	2013	2014	Total	%
High - Environmental Hazard	4	7	8	4	11	15	6	11	**66**	**2.2%**
High - Structurally Unsafe	1	6	9	15	10	9	12	8	**70**	**2.4%**
Medium - Age	18	68	45	133	201	90	92	79	**726**	**24.7%**
Medium - Minor Repairs Required	30	42	35	54	95	43	38	30	**367**	**12.5%**
Medium - Non Conforming	17	20	55	8	9	20	8	32	**169**	**5.7%**
Low	218	222	217	244	278	123	141	90	**1533**	**52.1%**
No Sewage System	0	0	1	4	0	1	1	2	**9**	**0.3%**
Total	**288**	**365**	**370**	**462**	**604**	**301**	**298**	**252**	**2940**	

At the outset of the HKCSI program, it was expected that property owners who knowingly had poorly functioning septic systems would be less inclined to participate in the program. Given this, it was also expected that the number of systems identified as high risk would increase towards the end of the first cycle of the program. Table 3.2 shows the risk assessment per year as a percent of the total inspections. Generally, the number of systems identified as high risk did increase towards the end of the program cycle; however the peak was observed in the middle of the program. This middle peak is likely a reflection the number of inspections completed in Point Clark North (the target area with the most systems with high risk ratings), as well as laggards participating in early target areas and more inspections completed in the rural areas of the Township.

Table 3.2 Risk Assessment, as percentage of total systems inspected, 2007-2014

	2007	2008	2009	2010	2011	2012	2013	2014	Total
High	0.2%	0.4%	0.6%	0.6%	0.7%	0.8%	0.6%	0.6%	**4.6%**
Medium	2.2%	4.4%	4.6%	6.6%	10.4%	5.2%	4.7%	4.8%	**42.9%**
Low	7.4%	7.6%	7.4%	8.3%	9.5%	4.2%	4.8%	3.1%	**52.1%**
No Sewage System	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	**0.3%**

The number of systems assessed as low risk generally decreased towards the end of the first inspection cycle. In 2014, the smallest percentage of low risk systems were inspected. This pattern is not surprising, as it confirms that property owners with newer, well maintained systems are more likely to complete an inspection earlier.

An examination of the spatial distribution of the high risk assessments revealed that the majority of high risk systems were located in Point Clark North (see Table 3.3). Nearly 20% of the systems inspected and given a high risk rating were found in that target area. Many of the systems given a high risk rating in Point Clark North were old barrel or cesspool systems or had failed clay leaching beds, and likely failed as a result of age. The situation is similar in Point Clark South,

where 11 systems were given a high risk rating. Again, this is likely a function of the age of the systems.

Table 3.3 Number of High Risk Systems Identified per Target Area, 2007-2014

Target Area	Count of High Risk Systems
Point Clark North	27
6_SR20_86_1	12
Point Clark South	11
NE_6_BND	10
West of 21	9
6_1_86_BND	8
Con10_21_86_SR20	8
Silver Lake	8
Bruce Beach North	7
Boiler Beach	4
NW_Con10_SR20	4
Whitechurch	4
Bruce Beach South	3
Con12_Con10_OH	3
Jardine Creek	3
Blairs Grove WHPA	2
Heritage Heights	2
Kin Bruce	2
Kinlough	2
Lurgan Beach	2
BBN_LakeRange	1
Blairs Grove	1
Con10_SR20_6_1	1
Point Clark WHPA	1
Twnln_SR20_Conc10_OH	1
Murdoch Glen WHPA	0

High-risk systems were also identified in the rural areas of the Township. Approximately 7% of the high-risk systems inspected were in the NE_6_BND (former Kinloss Township), followed by 6% in the area between Highway 21 and Lake Range Drive. Similar to the high-risk systems in Point Clark, it is thought that most of the high-risk systems in these areas reflect the general age of the system, as opposed to poor maintenance or operating conditions.

3.0 PROGRAM STATISTICS

3.3 REPAIRS REQUIRED

Beginning in 2009, any repairs required as found during an inspection, were identified in the inspection reports. Repairs were identified as either major, which impeded the functioning of the system, or minor. Major repairs included: poor tank or lid condition, bed obstructions, and system failure. Minor repairs included: repairs to baffles, minor damage to lids, trees or roots in the system, pump-outs required, effluent filters cleaned, replace pump chambers or distribution boxes, tanks under/in dwellings, and insufficient venting in privies. Table 3.4 below summarizes the number of major and minor repairs identified and number of repairs made during the first inspection cycle. It should be noted that the number of systems given the minor repairs required risk assessment is not equivalent to the number of repairs required. This discrepancy is due to a number of instances when minor repairs were identified, such as repairs to baffles or a pump-out; however a different risk assessment (such as medium-age or medium – non-conforming) was given to the system based on the judgment of the inspector.

Table 3.4 Major and Minor Repairs Required and Made, 2007-2014

	Repairs Required			**Repairs Made**	
Year	*# of repairs*	*Minor repair*	*Major repair*	*Minor repair*	*Major repair*
2007*	36	31	5	3	2
2008*	57	44	13	9	7
2009	71	54	17	35	14
2010	90	71	19	31	9
2011	128	107	21	79	19
2012	71	46	25	31	18
2013	56	38	18	20	10
2014	50	31	19	15	8
Total	**559**	**422**	**137**	**223 (53%)**	**87 (64%)**

3.0 PROGRAM STATISTICS

Property owners are asked to return a repair form sent with their inspection report, after they have completed the required repairs to their system. Approximately 53% of property owners with systems requiring minor repairs, have done so. A greater number of repairs forms for major repairs have been received (64%). Repairs required for properties that have not sent in a repair form, will be followed up in the next round of inspections. Table 3.5 provides a summary of the types of repairs required. The most common repairs required are those to baffles (typically replacement), followed by repairs to tank lids. The majority of major repairs required are the result of poor tank condition or bed obstructions.

Table 3.5 Repair Types by Occurrence

Repair Type	%
Outflow baffle	35.9
Inflow baffle	27.6
Cap repaired/replaced	12.3
Tank condition*	9.0
Bed obstructions*	7.7
Roots/Trees	2.5
Greywater configuration issue	0.9
Entire System*	0.9
Pump-out required	0.6
Effluent Filter	0.6
Replace pump chamber	0.4
Distribution box	0.4
Soils clogged/blockage	0.4
Insufficient Venting	0.4
Tank in/under dwelling	0.4

* Indicates major repair

3.0 PROGRAM STATISTICS

3.4 TYPES OF SYSTEMS

The HKCSI inspection program requires inspections for all types of private, on-site sewage systems. The table below summarizes the types of actively used septic systems in the Township. Conventional systems, which include a septic tank and leaching bed, are by far the most common type of system used, with 2,947 incidences. This is followed by privies, which are primarily used by the Mennonite community, although there are a few privy systems for cottages located along the lakeshore. There were 37 tertiary systems inspected. The majority of these systems are located along the lakeshore, although there 11 tertiary systems located elsewhere in the Township. The least common system types are cesspools and holding tanks. These are generally relics of old cottage systems.

Table 3.6 Types of Inspected Septic Systems

System Type	Count	% of Total Systems
Conventional	2,947	94.5%
Privy	110	3.5%
Tertiary	37	1.2%
Cesspool	19	0.6%
Holding Tanks	6	0.2%
Total	3,119	100.0%

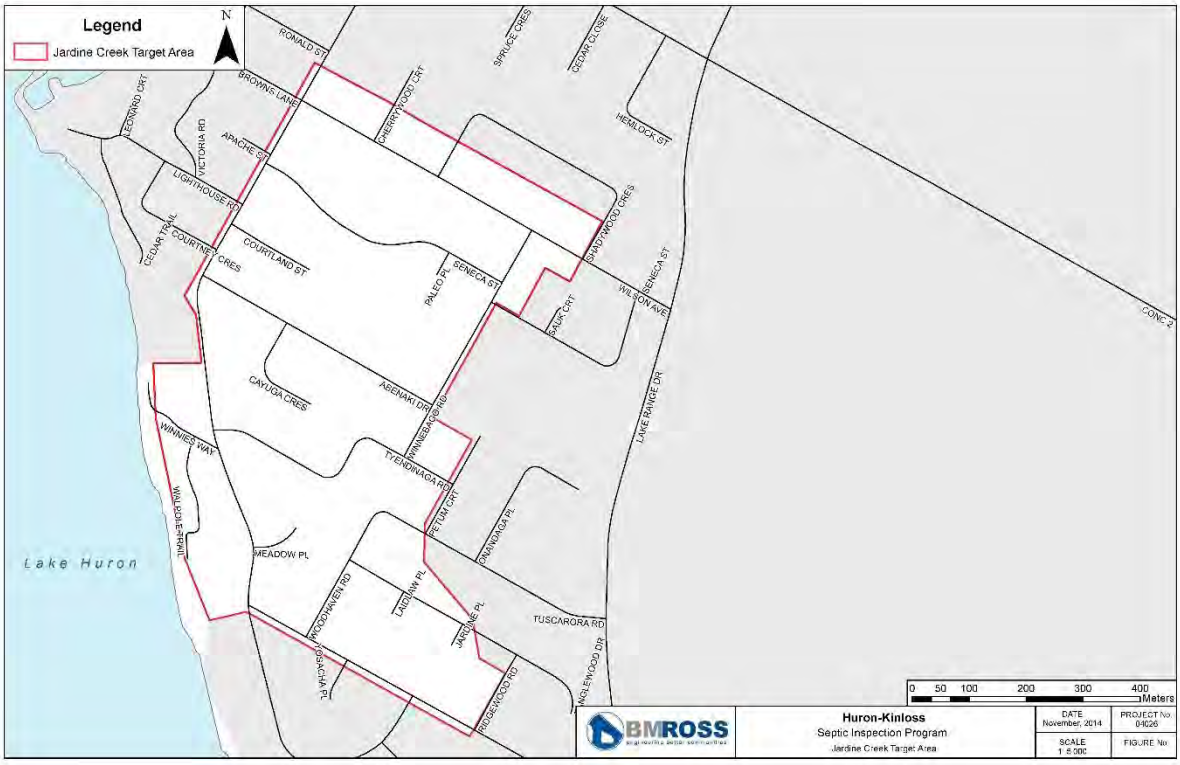
4.0 Results by Target Area

Table 4.1 Target Areas by Year Targeted

Initial Target Year	Target Area	Section
2007	• Jardine Creek • Kin-Bruce • Bruce Beach South	• 4.1 • 4.2 • 4.3
2008	• Bruce Beach North • Kinlough • Lurgan Beach • West of 21	• 4.4 • 4.5 • 4.6 • 4.7
2009	• Boiler Beach • Murdoch Glen WHPA • Point Clark WHPA • Blairs Grove WHPA • Whitechurch • Point Clark South	• 4.8 • 4.9 • 4.9 • 4.9 • 4.9 • 4.10
2010	• NW_Con10_SR20 • Con10_21_86_SR20 • Silver Lake • Blairs Grove	• 4.11 • 4.11 • 4.12 • 4.13
2011	• Con12_Con10_OH • 6_SR20_86_1 • Heritage Heights • BBN_Lakerange • Point Clark North • 6_1_86_BND	• 4.14 • 4.14 • 4.15 • 4.16 • 4.17 • 4.18
2012	• TwnLn_SR20_Con10_OH • NE_6_BND	• 4.14 • 4.18

4.0 RESULTS BY TARGET AREA

4.1 JARDINE CREEK



The Jardine Creek target area was initially targeted in 2007. This target area includes all properties located within the Jardine Creek watershed, located in Point Clark. Properties in Jardine Creek are a mix of permanent residences and seasonal cottages. The number of properties within the target area requiring an inspection is noted in the table below. There were 34 properties that did not require an inspection based on MPAC data (assessed as a vacant lot, etc.,)

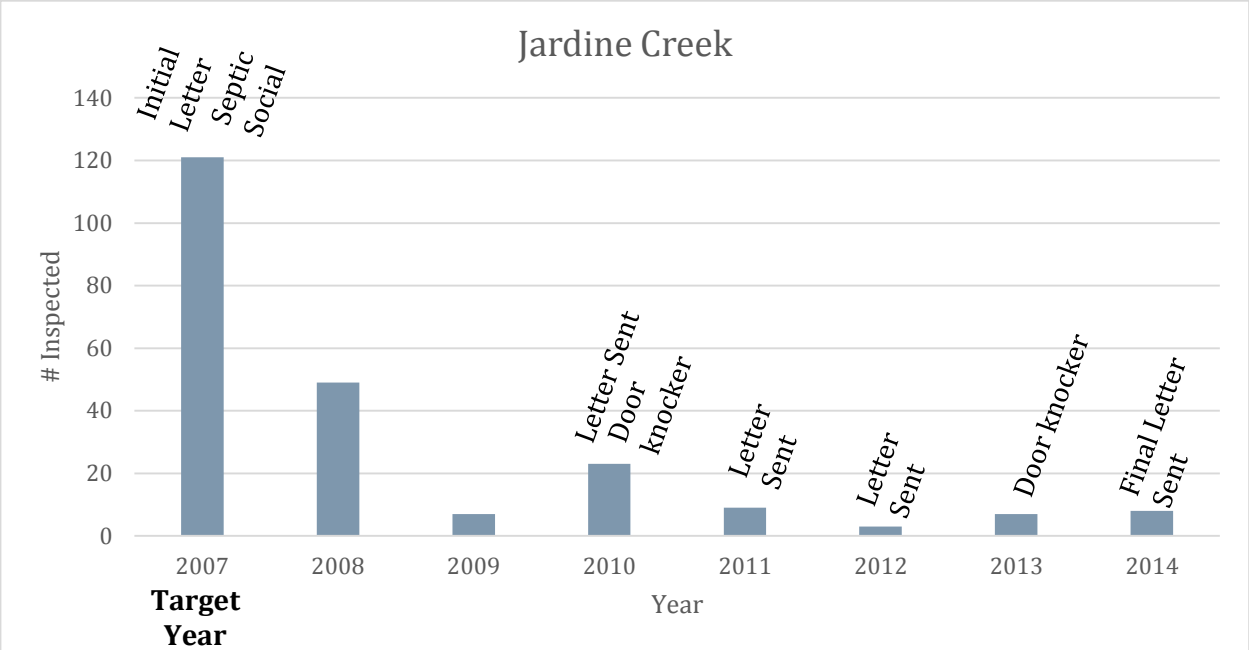
Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
263	229	227	2	99%

Of the properties that were inspected, 59% were given a low risk rating, 40% a medium rating, and 1% were considered high risk. The breakdown of risk ratings is shown below. It is noted that there were 2 systems given a high risk as environmental hazard and 1 system was structurally unsafe. There were 33 systems requiring minor repairs, such as replacement baffles, and 42 systems given a medium risk due to their advancing age. There were 15 systems found that either do not conform to general building code requirements or were installed by the property owner, but are considered functional.

4.0 RESULTS BY TARGET AREA

Risk Rating	Number of Inspected Systems
High – Environmental Hazard	2
High – Structurally Unsafe	1
Medium – Age	42
Medium – Minor Repairs Required	33
Medium – Non-Conforming	15
Low	134

The number of inspections in the target area between 2007 and 2014 are shown in the figure below. Points and methods of contact are indicated on the figure. Following the initial letter for the target area, a septic social was held at the cottage of the local beach association president. The event was well attended. Approximately half (53%) of the properties requiring an inspection in the target area were inspected in the first year. A further 21% were inspected in the following year without any contact. A reminder letter and door knocking efforts in 2010 encouraged another 23 residents (10%) to participate. The remaining 12% required additional contact to participate.



The uptake of the program in Jardine Creek shows the impact of a septic social in influencing behaviours. The septic social was well attended, especially by members of the local beach association. It was also aided by hosting the social at the home of a well-known and well-respected member of the local community. This helped spread the benefits of the program throughout the community. Also supporting program participation in this target area was high local awareness of water quality issues.

4.2 KIN-BRUCE

This target area includes the subdivision known as Kin-Bruce, located between Concessions 10 and 12, north of the Heritage Heights area, and between Boiler Beach Road and Lake Range Drive. It includes residences along Kennedy Road, McCormick Drive and Willis Crescent. There are a total of 72 properties within the Kin-Bruce target area, however, only 61 properties have residences with private sewage systems. The majority of homes in this subdivision are permanent residences. This area was initially targeted for inspections in 2007, as it is an older subdivision with suspected older septic systems. Additionally, soils in the area have a higher clay content, which can be problematic for septic systems.

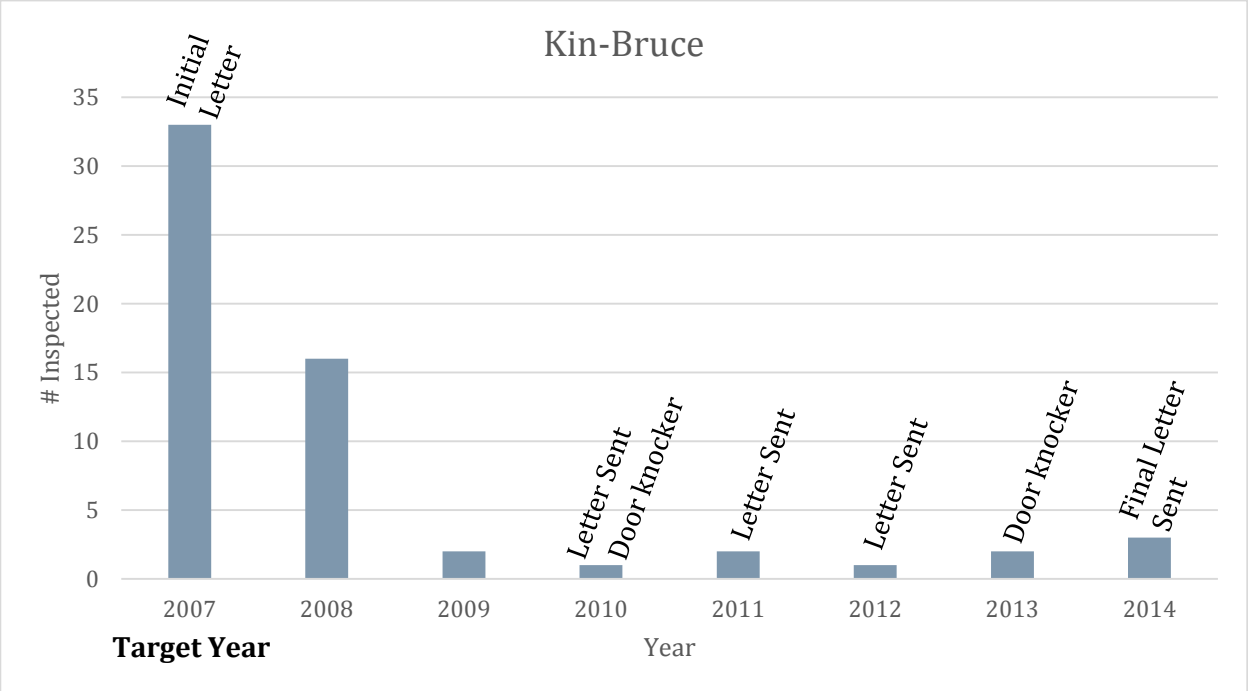
Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
72	61	60	1	98%

In Kin-Bruce, there is one property that has not been inspected. The remaining 60 properties with septic systems have been inspected. In the area, two systems were given a high environmental hazard risk rating due to poorly function leaching beds. A total of 18 systems, nearly a third in the target area, were given a medium rating. Of those with a medium rating, 12 required repairs. There were 40 systems rated as low risk.

4.0 RESULTS BY TARGET AREA

Risk Rating	Number of Inspected Systems
High – Environmental Hazard	2
High – Structurally Unsafe	0
Medium – Age	5
Medium – Minor Repairs Required	12
Medium – Non-Conforming	1
Low	40

Program uptake, as shown by the number of inspections per year from 2007 to 2014 is shown in the figure below. Similar to Jardine Creek, which was also one of the first target areas, there was a strong initial response to the program in Kin-Bruce. Over half of property owners with septic systems had an inspection completed after receiving an initial letter. In the following year, another 26% of residents participated without further prompting. The remaining 20% of residents (11 property owners) required additional contact and reminders to participate.



This target area did not have a septic social. Given the area is primarily permanent residents, not connected by membership in a local organization, it was thought a septic social would have minimal impact. The small size of the target area (both population and geographically), likely allowed for word of mouth communication to promote the program, as observed by the number of inspections completed in 2008 without receiving any letters or reminders.

4.3 BRUCE BEACH SOUTH

The third area targeted in 2007 was Bruce Beach South. This target area includes the properties located along the shoreline between Concession 6 and Concession 8. Residences in the area are almost exclusively seasonal residences. A historic cottage area, there are numerous cottages dating from the early 1900's. In recent years, however, many of the older cottages have been replaced by larger residences that are occupied for greater lengths of time. Many residents of this target area are members of the Bruce Beach Cottage Association, which has been vocal in local environmental issues, especially those pertaining to water quality. This target area has experienced nuisance algal blooms along the shoreline.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
98	97	97	0	100%

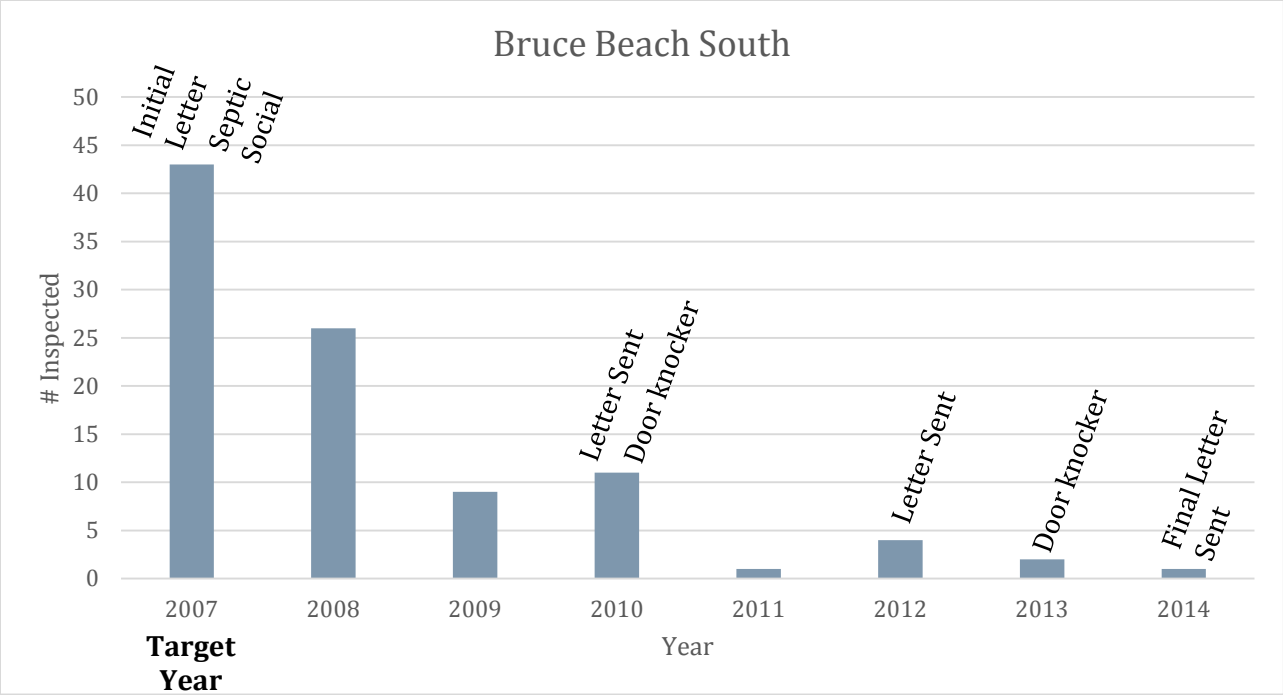
4.0 RESULTS BY TARGET AREA

There are 98 properties within the Bruce Beach South target area, of which, 97 required an inspection. Every property required in this target area has been inspected. The majority of systems, or approximately 70% were given a low risk assessment. 26 systems (or 26%) were assessed as medium risk. Of the medium risk systems, 6 required repairs, 10 were considered non-conforming (generally related to age and size of the tank) and another 10 were given a medium risk due to their age. Two systems were assessed as high risk due to the structural condition of the tank. One system was found with a malfunctioning leaching bed and was given a high environmental hazard risk.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	1
High – Structurally Unsafe	2
Medium – Age	10
Medium – Minor Repairs Required	6
Medium – Non-Conforming	10
Low	68

The proportion of property owners in Bruce Beach South who had an inspection completed following the initial contact letter, was less than what was observed in the other areas targeted in 2007. A septic social was also held at a property within the target area. However, less than half of property owners contacted (approximately 44%) booked an inspection in 2007. In the following year, another 36% of property owners participated without any additional contact. Property owners who had to participate in 2010 were sent another letter reminding them of the program, in addition to doorknocker efforts. The result of these efforts was another 11% of property owners participating. The remaining 8 property owners required additional contact up until 2014 to participate.

4.0 RESULTS BY TARGET AREA



The Bruce Beach South target area has one of the highest seasonal to permanent resident ratios in the Township. Despite this, there is a very strong sense of community, with many property owners belonging to the Bruce Beach Cottagers Association. Residents are very aware of water quality issues in the community. In this target area there was an opportunity to partner with a beach association member to host a septic social. The septic social was well attended; however the initial response to letters and septic social was not as strong as in comparison to the other 2007 target areas, where over 50% participated in the first year. In Bruce Beach South, the initial participation rate was 44%. It is suspected that there were a number of residents concerned about the age and condition of their systems and as a result were more hesitant to participate. Additionally, coordinating a time for an inspection may have seemed difficult for property owners that rent out their properties or live further away (such as in the USA).

4.4 BRUCE BEACH NORTH

The Bruce Beach North area was targeted for inspections, beginning in 2008. The area includes properties located between Concession 8 and 10 along the shoreline, Bruce Beach Road, and along the west side of Lake Range Drive. Within the target area, residences are a mix of permanent and seasonal occupation. Homes located along Lake Range Drive are primarily permanent dwellings, while those along the lakeshore are seasonal. Similar to Bruce Beach South, many of the property owners along the shore are members of the Bruce Beach Cottage Association. Cottages in the area range in age, dating to the early 1900's to more recent replacements of original cottages. The newer seasonal residences in this area tend to be larger than the original cottages and used more frequently. In recent years, this area has experienced algal blooms and a decline in near shore water quality.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
228	189	187	2	99%

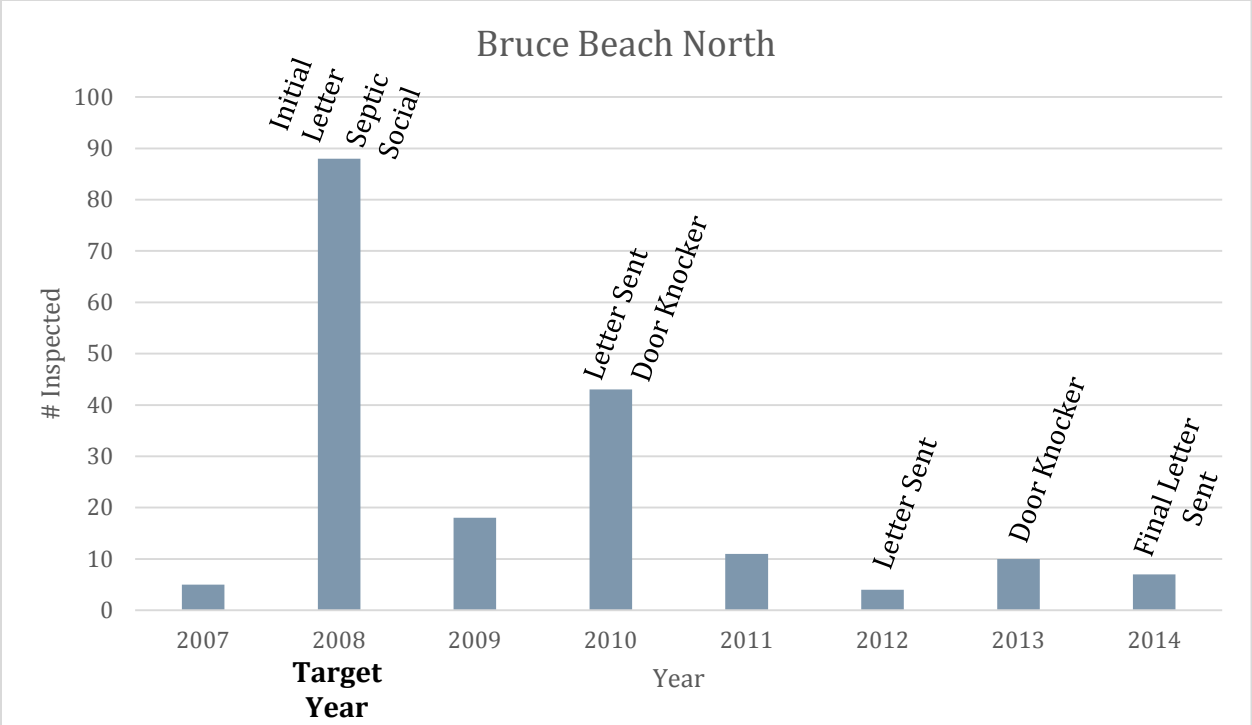
4.0 RESULTS BY TARGET AREA

There are a total of 228 properties within the target area, of which 189 were identified as having a septic system. During the first round of the HKCSI program, 187 properties were inspected. There are 2 properties that have not been inspected as of 2014. In this target area, 7 systems were given a high risk rating from their inspection. Of these, 3 were given a high rating as a result of the poor structural condition of the septic tank. There were four systems identified as environmental hazards due to failing beds, total system failure, or type of system (e.g., homemade cesspool). A total of 79 systems were assessed as medium risk, with the majority of these being given a medium risk due to their age. Many of the systems given the risk assessment of medium age were also noted to be undersized by current standards. There were 100 systems given a low risk rating.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	4
High – Structurally Unsafe	3
Medium – Age	46
Medium – Minor Repairs Required	25
Medium – Non-Conforming	8
Low	100
No Sewage System	1

An initial letter informing property owners of the program was sent in 2008, however there were 5 residents who participated prior to receiving the letter. Following the initial letter, an additional 88 property owners had inspections completed, which captured just short of 50% of properties requiring inspections. In the following year, the number of inspections completed in the target area sharply declined. Another letter and doorknocking efforts in 2010 encouraged 43 additional property owners (22%) to participate. Significant efforts with additional letters, doorknocking and phone calls were required between 2011 and 2014 to encourage the remaining 32 property owners to have an inspection completed. Again, it is noted that there are 2 properties that have not yet been inspected. For both properties, project staff have been unable to find a telephone number for the property owners.

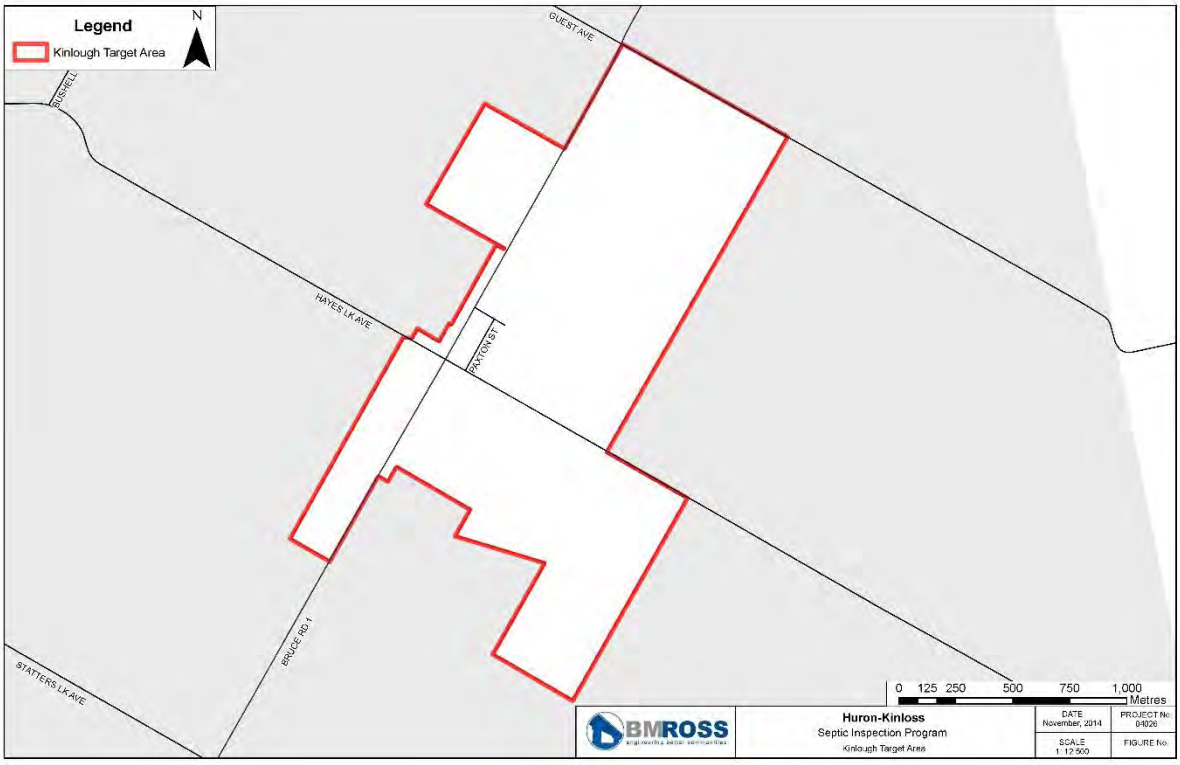
4.0 RESULTS BY TARGET AREA



The Bruce Beach North target area is very similar to Bruce Beach South, with many seasonal residents and a strong membership in the local beach association. A septic social held in this area in 2008 was very successful in encouraging property owners to complete an inspection. The two septic socials in the general Bruce Beach area helped reduce the barriers to participation in the program in this target area significantly. It is also likely that word of the program spread through the beach association. Doorknocking efforts in 2010 were also very successful. These efforts were timed to maximize the number of seasonal residents reached. Similar to Bruce Beach South, there were some issues coordinating inspections for some seasonal residences where properties were rented out, owners lived out of the country, or ownership was shared by families. However, these issues were relatively rare.

4.0 RESULTS BY TARGET AREA

4.5 KINLOUGH



Another area targeted in 2008 was Kinlough. Located at the intersection of Hayes Lake Avenue and Bruce Road 1 in the former Kinloss Township, Kinlough is a small rural hamlet, made up approximately 35 permanent homes. It is surrounded by agricultural land. Many of the lots in Kinlough are small and it was suspected that septic systems were older than in other areas of the Township. Additionally, residents are serviced exclusively by private wells and there was concern about inadequate septic system setbacks.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
52	36	35	1	97%

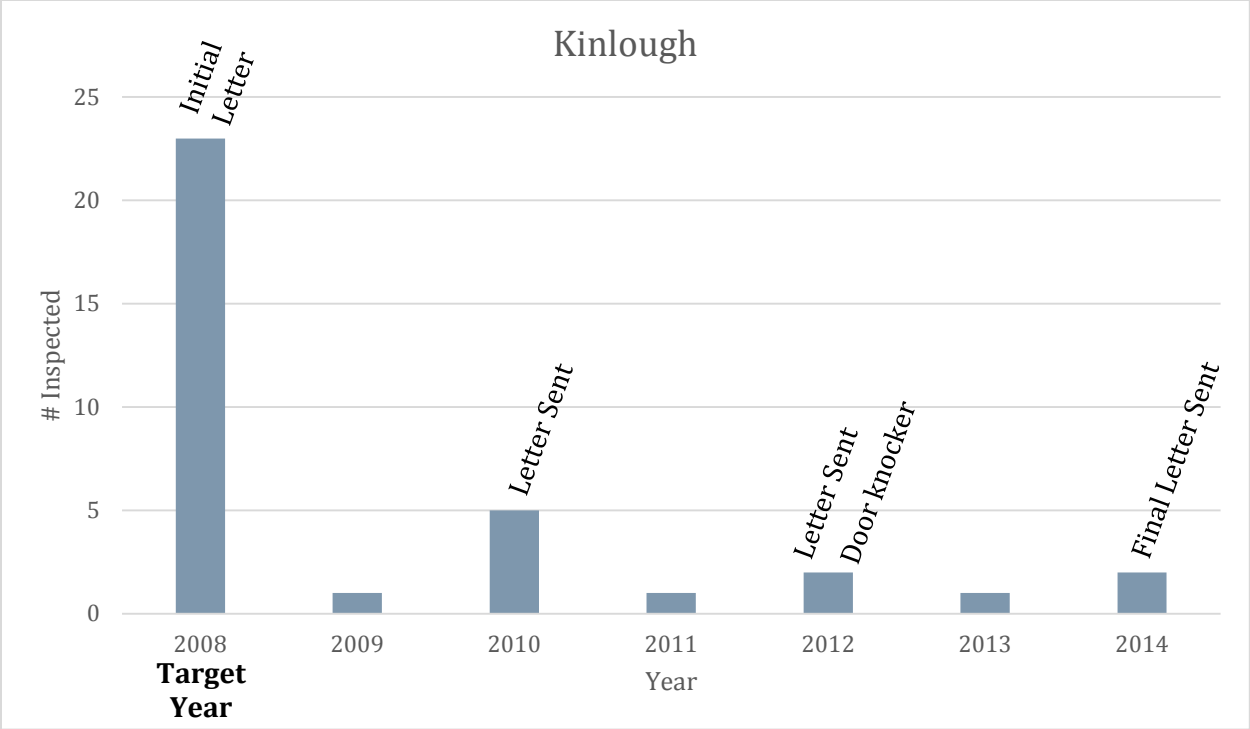
4.0 RESULTS BY TARGET AREA

There are 36 properties in Kinlough that required an inspection. At the end of Round 1 of the HKCSI program, 35 properties were inspected, leaving 1 uninspected system. The majority of systems in the target area, 14 or 38% were given a medium risk rating due to their age. Overall, 58% of the systems in Kinlough were assessed as medium risk. Two systems were given high risk ratings, one due to a collapsing tank and another due to an inadequate leaching bed. A low rating was given to 31% or 11 systems in the target area.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	1
High – Structurally Unsafe	1
Medium – Age	14
Medium – Minor Repairs Required	2
Medium – Non-Conforming	5
Low	11
No Sewage System	1

There was strong program participation following the initial letter sent in 2008. In the first year of inspections in Kinlough, 23 residents (or 64%) had inspections completed. A follow up letter in 2010, encouraged another 5 property owners to participate. Doorknocking and phone calls to property owners were required to get the remaining property owners, save one, to complete an inspection.

4.0 RESULTS BY TARGET AREA



In previously targeted areas, a close connection to the Lake and water quality issues helped drive participation in the HKCSI program. Kinlough, a small hamlet in the interior of the Township, had significant uptake of the program despite being relatively isolated from the lakeshore. Positive media coverage of the program in other areas of the Township was likely helpful in promoting participation. In this target area, the program team identified the barriers in organizing inspections for institutions such as churches, including determining who to contact and a lack of knowledge about the locations of septic systems. Later letters were revised as a result to more clearly state that all properties, including institutions, are required to participate in the program.

4.6 LURGAN BEACH

Another lakeshore area targeted in 2008 was Lurgan Beach. The Lurgan Beach target area includes properties located along the lakeshore, north of the mouth of the Pine River and south of Bell Drive. It includes properties along Smith Lane, Cathcart Street, and Bell Drive. Lurgan Beach includes both seasonal and permanent residents. Similar to other areas along the lakeshore, many of the lots in the area are small. Generally, soils in the area are sandy. Also similar to other beach areas, the local beach association (Lurgan Beach/Blair's Grove) has been vocal regarding water quality and algae issues.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
165	135	134	1	99%

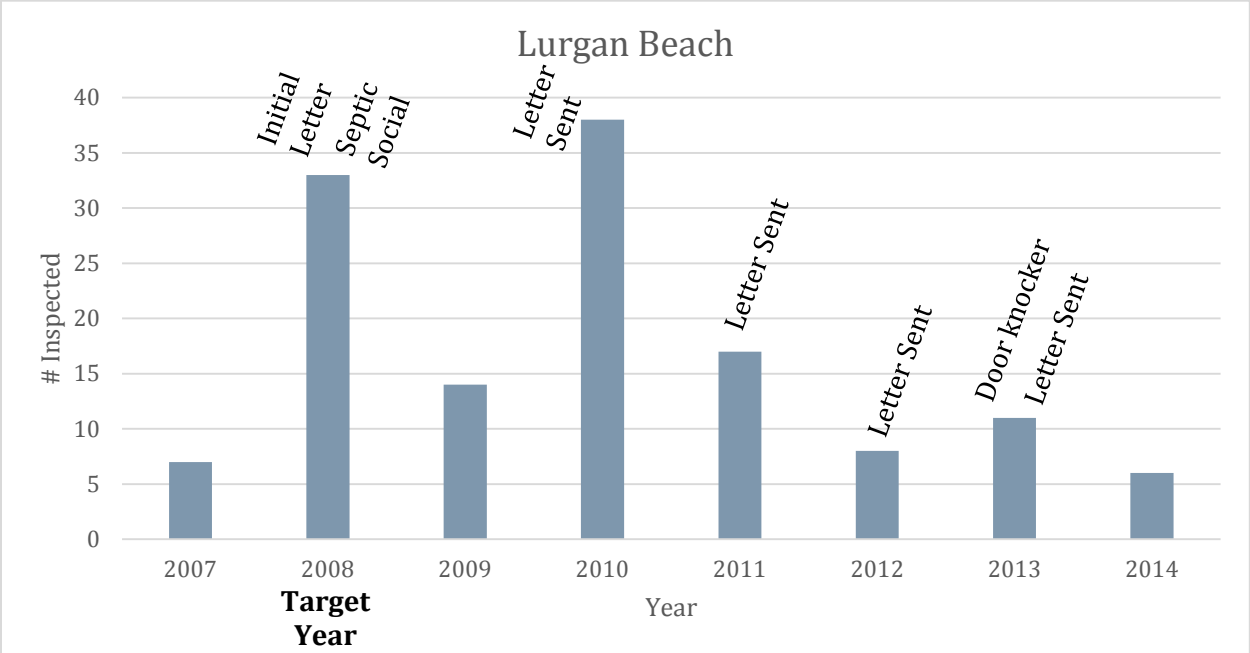
4.0 RESULTS BY TARGET AREA

Within the Lurgan Beach target area, there are 165 properties with 135 of those requiring an inspection. There is one property in the target area that has not had an inspection completed as of the end of Round 1. In this target area, two systems were identified as high risk; one as a result of the condition of the septic tank and another due to a poorly functioning leaching bed. Approximately 25% of the systems inspected were identified as old and undersized and were given a medium risk rating due to their age. There were 22 systems that required repairs to baffles, filters or lids, and 7 that were identified as non-conforming. Of the systems in Lurgan Beach, 69 or 51% are considered low risk.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	1
High – Structurally Unsafe	1
Medium – Age	34
Medium – Minor Repairs Required	22
Medium – Non-Conforming	7
Low	69

Similar to the Bruce Beach North target area, a number of property owners in Lurgan Beach participated in the program prior to receiving the initial letter. Between 2007 and 2009, during which the only contact was the initial letter, 54 properties owners had an inspection completed. In 2010, a reminder letter was sent and 38 property owners responded, 5 more than the number that booked an inspection following the initial letter. This suggests that more property owners in the area were hesitant to book inspections than in other target areas. This may be due to concerns about the inspection process and/or the condition of their systems. Another 10% of residents booked an appointment following another reminder letter in 2011. Doorknocking, additional letters and phone calling were required between 2012 and 2014 to encourage another 18% of property owners to participate in the program.

4.0 RESULTS BY TARGET AREA



The Lurgan Beach target area had a septic social, hosted by the local beach association, in 2008. The response to the septic social and initial letter was less than expected. The septic social, which was held in August, was likely held too late in the summer season to capture many of the seasonal residents. Additionally, given the age of some of the cottages in this target area, it is thought that some property owners were hesitant to expose the age and condition of their systems.

Sandy soils in the area allow septic issues to go unnoticed, so evidence of problems in older systems can go unnoticed. However, during the course of inspections, there were numerous instances of tree roots entering tanks and leaching bed tiles. When this was encountered, it was noted on the inspection report. Future inspections should monitor whether or not these situations were remedied.

4.7 WEST OF HWY 21

The area west of Highway 21 and east of Lake Range Drive, between the north and south boundaries of the Township was also targeted in 2008. This target area consists primarily of permanent residences, on farms or on lots severed from farm properties. The proximity of this area to the lakeshore is the reason for targeting it early in the program. This area was also the first agricultural region of the Township to be targeted.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
183	89	88	1	99%

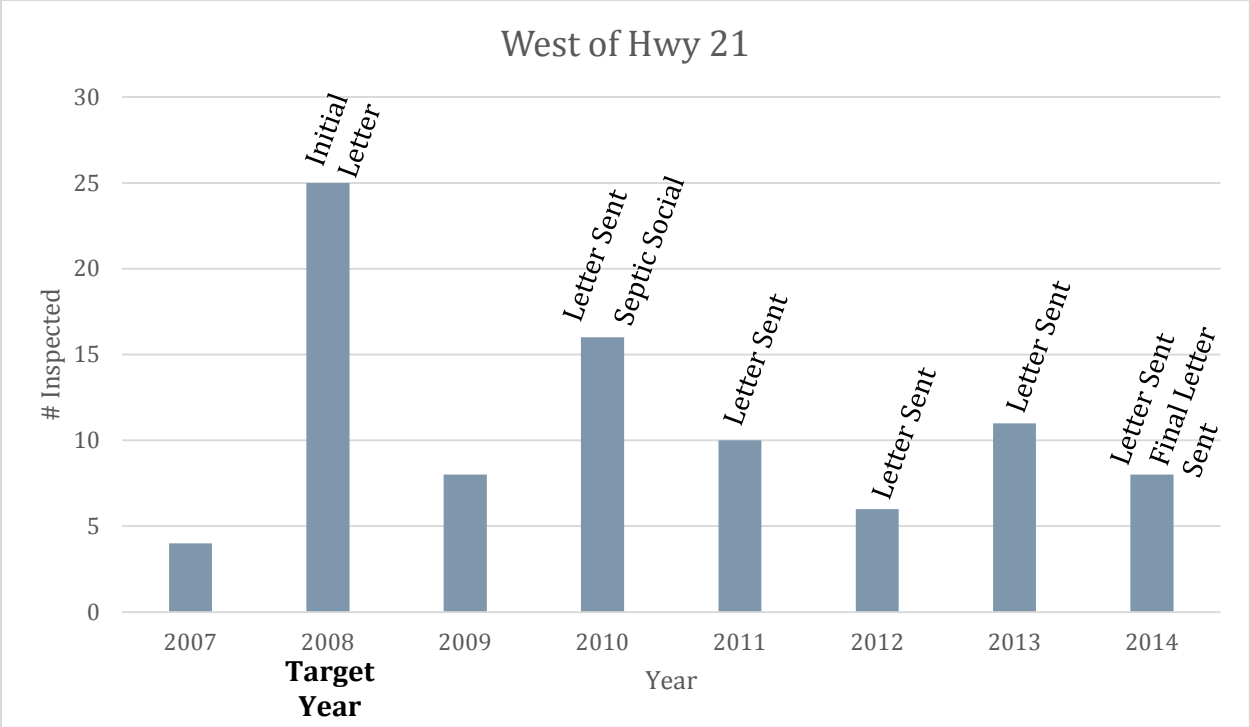
4.0 RESULTS BY TARGET AREA

There are 183 properties within the West of 21 target area. Of that, 89 properties were identified as having a septic system and requiring an inspection. There is one property with a septic system that has not been inspected. A number of systems were given high risk ratings, equivalent to 10% of the systems in the target area. There were 6 systems given a high risk as environmental hazards, due to bed failures, unpermitted addition of tile runs, and discharging into ditches. Another three systems were assessed as high risk due to the poor structural condition of the septic tanks. Almost a quarter of the systems (21 in total) in the target area can be considered medium risk due to their age; 9 as a result of required repairs; and 4 for not conforming with building code standards. Approximately 48% of the systems were given a low risk rating.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	6
High – Structurally Unsafe	3
Medium – Age	21
Medium – Minor Repairs Required	9
Medium – Non-Conforming	4
Low	44
No Septic System	1

Property owners in this target area were slower to participate than in the previously targeted lakeshore areas. While a number did have inspections prior to the area being identified as a target area, the initial letter resulted in only 28% of property owners completing an inspection in 2008. This proportion is roughly half of what was observed when initial letters were sent out along the lakeshore. Another letter was sent to property owners in 2010, following which another 16 inspections were completed. The remaining property owners received numerous doorknocker visits, letters and phone calls in the following years before inspections were completed.

4.0 RESULTS BY TARGET AREA



This area was the first agricultural area targeted for inspections. Given the wide geographical area, a septic social was not held for this area. In comparison to the other areas target prior to West of 21, the uptake pattern was moderate – the initial response was muted and many of the property owners required numerous reminders. The moderate response may be the result of hesitation because systems in this area were generally older than along the lakeshore and the fear of being forced to replace systems.

4.8 BOILER BEACH

The Boiler Beach target area generally includes the properties located along Boiler Beach Road from Concession10 north to the boundary with the Town of Kincardine. This area was initially targeted in 2009. Residences in this area include both permanent and seasonal homes, with many located very close to the shoreline. A number of residences close to the Town of Kincardine and are connected to the Town's sewage service.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
180	136	131	5	96%

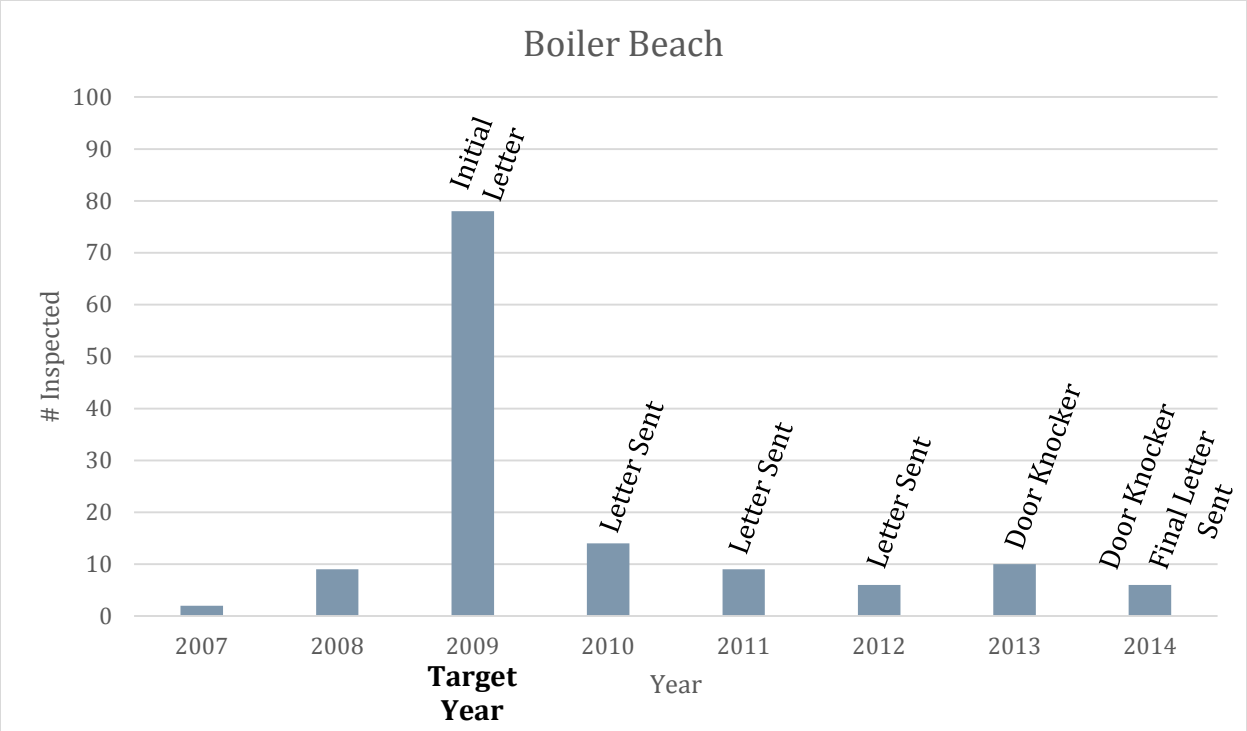
4.0 RESULTS BY TARGET AREA

This target area had 136 properties requiring an inspection. At the end of 2014, a total of 131 inspections were completed. The risk rating counts below include the risk ratings for seven cottages located west of Boiler Beach Road, which were subsequently removed and the septic systems decommissioned in 2012. There were 4 systems identified as high risk in the first round of inspections, in this target area. Of these systems, 3 were identified as environmental hazards due to failing beds, and 1 was given a high risk due to the poor condition of the tank. A medium risk assessment was assigned to 52 (or 38%) systems in the target area. Many of these systems were found to be older and undersized systems. The majority of systems inspected in this target area were given a low risk.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	3
High – Structurally Unsafe	1
Medium – Age	20
Medium – Minor Repairs Required	12
Medium – Non-Conforming	20
Low	79

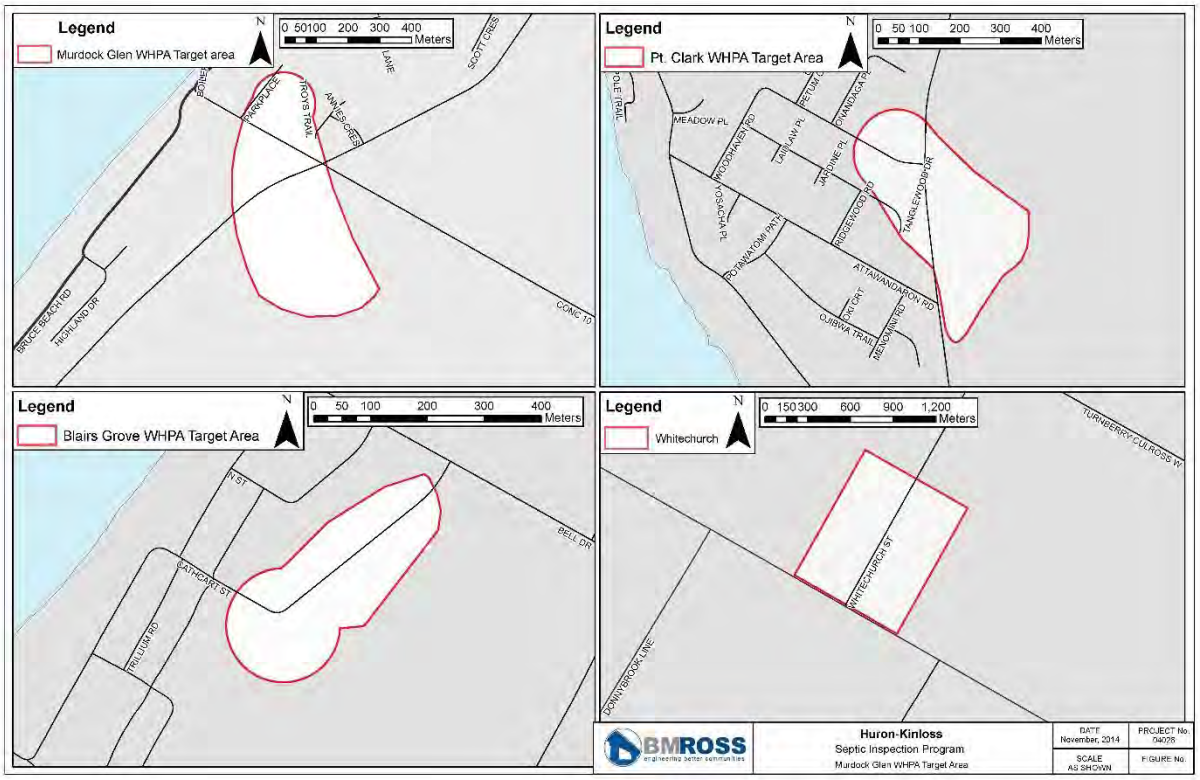
This area was targeted for inspections in 2009. There were 11 inspections completed prior to property owners receiving a letter about the program. These inspections were likely encouraged by media coverage in local newspapers and through word of mouth. Over half of the property owners contacted via the initial letter in 2009 booked an inspection that year. Follow up letters resulted in another 12 property owners participating in the program the next year. Subsequent efforts, which included phone calls, doorknocking and additional letters achieved an average of 8 additional inspections per year until 2014.

4.0 RESULTS BY TARGET AREA



Boiler Beach is the only lakeshore target area without a beach association. Given this, it was decided that a septic social would not likely be successful in this area. Contact with residents was primarily through letters and doorknocking efforts. Many residents in this area are located close to the lakeshore and there were concerns in the community about cottages located west of Boiler Beach Road. This awareness of water quality issues and septic system positively impacted participation in the program.

4.9 MURDOCH GLEN WHPA, POINT CLARK WHPA, BLAIRS GROVE WHPA, WHITECHURCH



In 2009, funding grants were made available to property owners in Well Head Protection Areas (WHPA) for pump-outs and repairs to septic systems. This funding was provided by the Ministry of the Environment through the Ontario Drinking Water Stewardship Program and was administered by the local conservation authorities. To take advantage of the available funding, four WHPA in the Township (Murdoch Glen, Point Clark, Blairs Grove and Whitechurch) were targeted for inspections. Letters sent to the property owners indicated the availability of the funding.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
98	98	98	0	100%

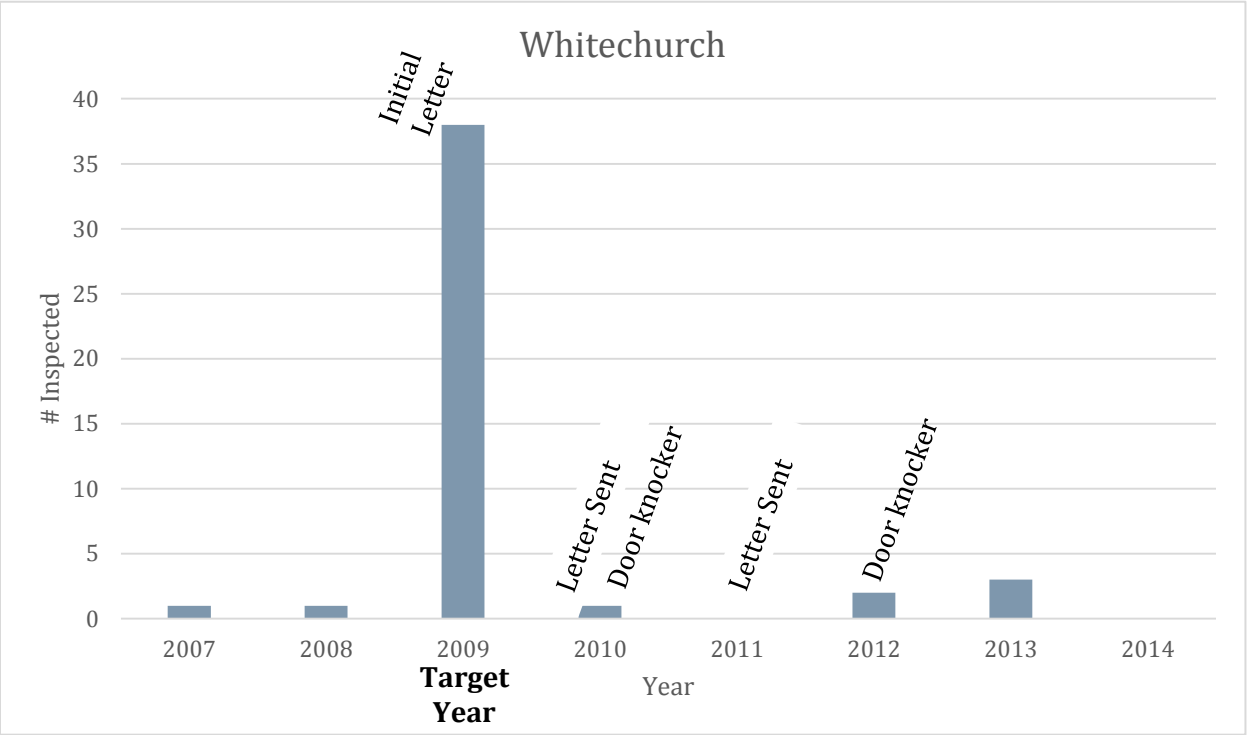
The WPHA target areas were defined as properties within the 2-year time of travel area of each well (identified as WHPA A and B in the applicable Source Water Protection Assessment Reports). The four WHPA target areas in Huron-Kinloss included 98 properties, all which have been inspected in Round 1. Of those properties, 7 septic systems were given high risk ratings. In the Blairs Grove WHPA two systems were assessed as high environmental risk due to a crushed

distribution box and a clogged leaching bed. There were also two systems in Whitechurch given the same rating due to leaching bed failures. In Whitechurch and Point Clark, three systems had tanks or tank lids in poor condition at the time of inspection. Across the four WHPA areas, 14 systems required repairs to baffles or lids. There were nine systems in Whitechurch rated as medium non-conforming, given the size, construction or installation of the system. 57 of the properties in these target areas were given a low risk rating.

Risk Rating	Number of Inspected Systems
High – Environmental Hazard	4
High – Structurally Unsafe	3
Medium – Age	11
Medium – Minor Repairs Required	14
Medium – Non-Conforming	9
Low	57
No Septic System	1

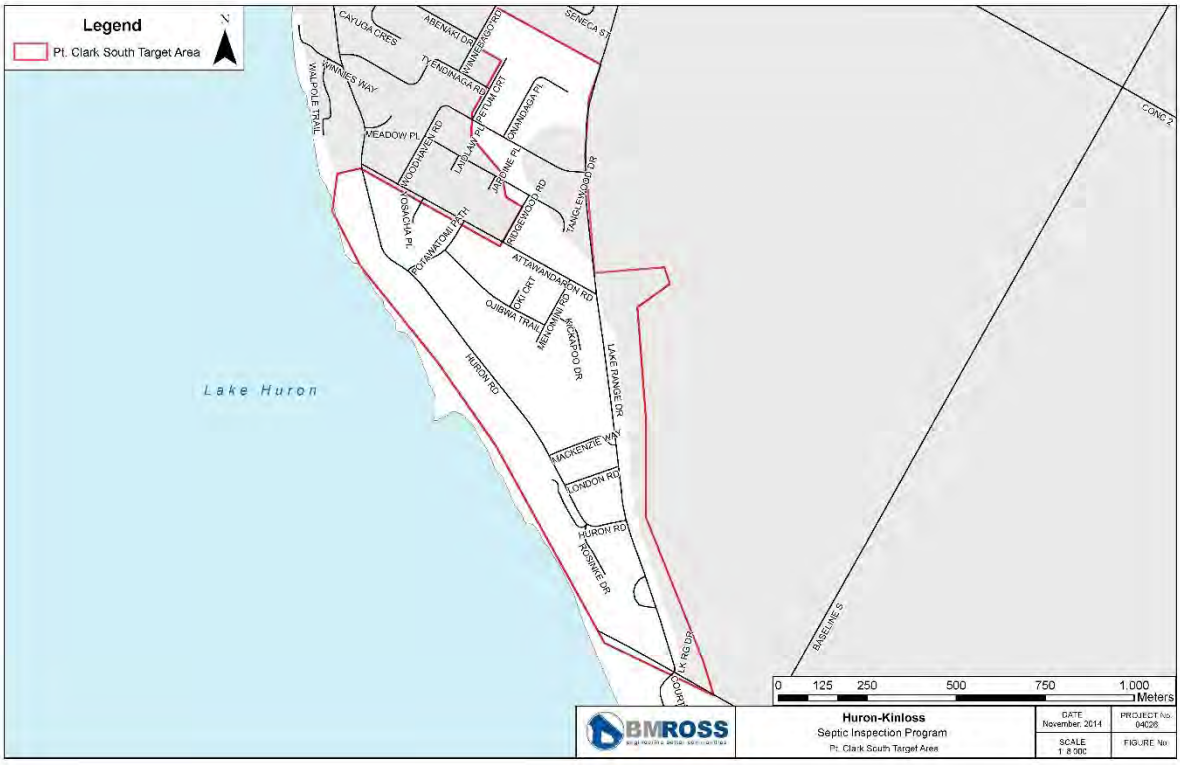
In each of the WHPA, there were a few properties that had inspections completed prior to receiving a letter about the program. In Point Clark, six out of twenty properties had inspections completed before 2009. This uptake may be due to the proximity of the Point Clark WHPA to the Jardine Creek study area. Following the initial letter, 83% of property owners in Whitechurch had an inspection done. Many residents in Whitechurch received funding to replace or repair their septic systems, and the opportunity for funding was certainly the reason for the strong response to the program. In the other WHPA target areas, the response to the initial letter was less pronounced, suggesting that property owners in these areas were less motivated by the potential for funding. It should be noted though, that generally homes and by extension, septic systems, are newer in the other WHPA target areas than in Whitechurch. Residents may have either assumed or known their systems would not require repairs and therefore, were not motivated by funding opportunities. In 2010, reminder letters were mailed out and property owners in the Blairs Grove WHPA were invited to a septic social at the Mayor's home. The result in each area was an average of 5 inspections following the additional contact. Inspections were completed in the Point Clark WHPA in 2011, and in Whitechurch in 2013. In Murdoch Glen and Blairs Grove there were three property owners that required extensive effort to encourage participation, and did not participate until issued a final notice letter.

4.0 RESULTS BY TARGET AREA



4.0 RESULTS BY TARGET AREA

4.10 POINT CLARK SOUTH



Another area targeted in 2009 was the southern part of Point Clark. This area includes properties generally south of Attawandaron Road to Amberley Road and west of Lake Range Drive. It also includes properties along Petum Court, Onandaga Place, Tuscarora Road and Tanglewood Drive. Similar to the Jardine Creek target area, this target area includes both cottages and permanent residences. It is a large area, with residences and septic systems of various ages and a range of lot sizes.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
265	212	208	4	98%

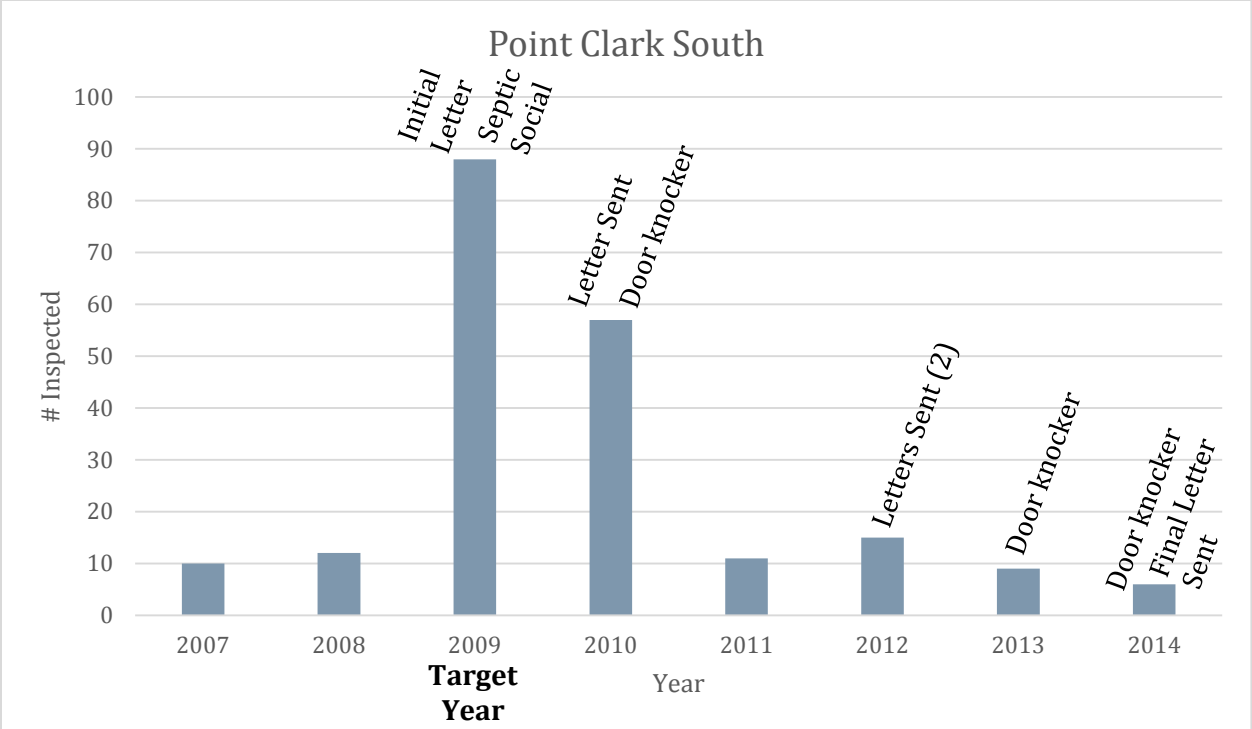
4.0 RESULTS BY TARGET AREA

There are 265 lots in this target area, with 212 requiring an inspection. In the first round of inspections, 208 have been completed, leaving 4 properties that have not participated in the program. Inspections found 11 systems (5%) with either major structural concerns or evidence of bed blockages or failure. Of the systems inspected, 41% were given a medium risk rating. The majority of these systems, 53 in total, were given a medium rating due to the advanced age of the system. The remaining medium-risk systems required repairs to baffles or filters to be cleaned (22 systems), or were considered non-conforming (13 systems). The remaining 110 systems inspected were given a low risk rating.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	3
High – Structurally Unsafe	8
Medium – Age	53
Medium – Minor Repairs Required	22
Medium – Non-Conforming	13
Low	110

Prior to this area being targeted, there were 22 inspections completed. These inspections are most likely the result of real estate transactions and awareness of the program through neighbours and media coverage. In 2009, initial letters were sent out and a septic social was held at a local residence. The response to these efforts was 88 residents booking an inspection. In the following year, an additional letter and door to door visits encouraged an additional 57 properties owners to participate. By the end of 2010, 78% of the required inspections were completed. The remaining property owners (40 between 2011 and 2014) required additional letters, phone calls and doorknocking visits before booking an inspection.

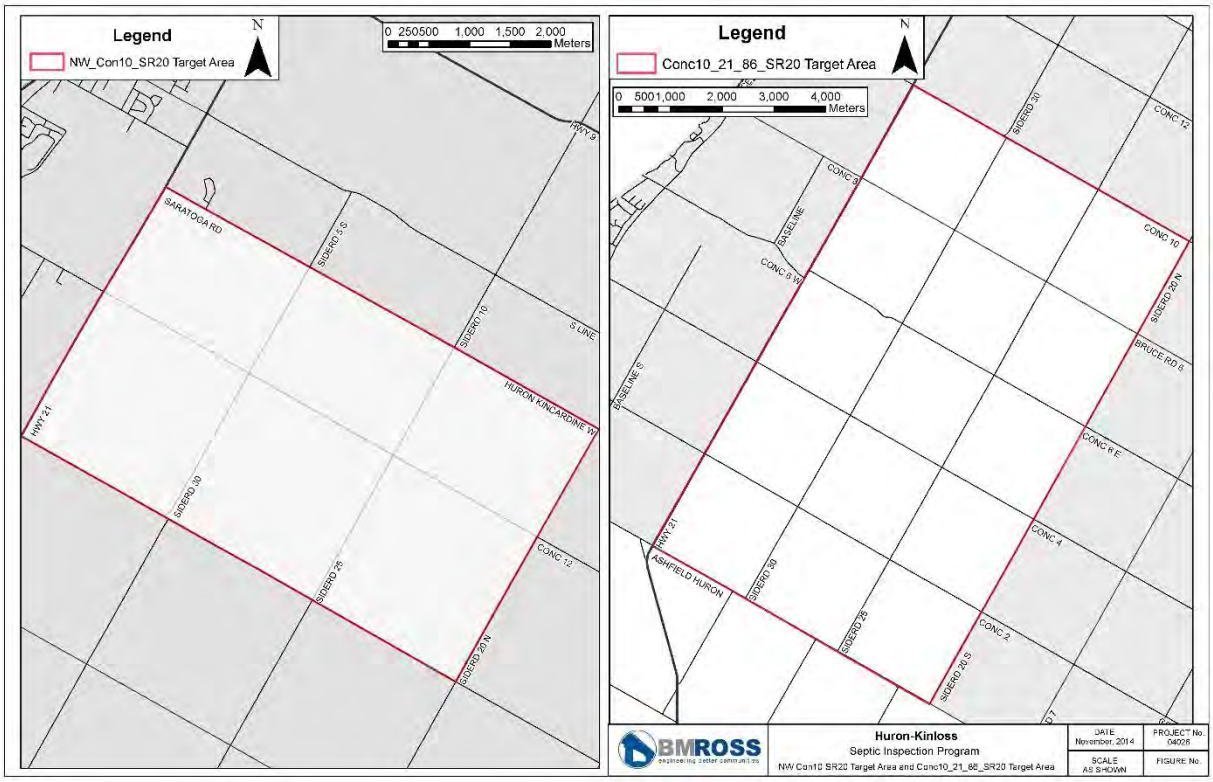
4.0 RESULTS BY TARGET AREA



The septic social held for the Point Clark South area had low attendance, in comparison to socials held in other target areas. Unfortunately, inclement weather likely impacted attendance. Another factor that may have reduced the effectiveness of a septic social is that the target area is relatively large and spread out and does not have a strong community group. In this area, a number of inspections occurred prior to real estate transactions. From this, the importance of establishing a good relationship with the real estate industry, including informing agents of the process for booking an inspection, requesting information, the purpose of the program, and limitations with respect to the inspection, was learned.

4.0 RESULTS BY TARGET AREA

4.11 NW_CON10_SR20 AND CON10_21_86_SR20



In 2010, two agricultural areas were targeted for inspections. These areas include properties located between Highway 21 and Side Road 20, and north of Amberley Road and south of Saratoga Road. Most of the land in these target areas is farmland and actively used for agricultural purposes. Residences in the area are typically farmhouses or homes located on land severed from a farm. These areas were targeted in 2010, as most of the lakeshore areas had previously been targeted and they are spatially close to the other target areas. Numerous inspections were still being completed in the lakeshore areas, so to improve efficiency and reduce driving times for the inspector, these agricultural areas were targeted.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
308	163	156	7	96%

4.0 RESULTS BY TARGET AREA

There are 308 properties in the NW_Con10_SR20 and Con10_21_86_SR20 areas; of those, 163 were identified as requiring inspections. The remaining properties are primarily agricultural or vacant lands. Across these target areas, there are 7 properties still requiring an inspection. There are two properties in the NW_Con10_SR20 target area where the property owner has refused to participate in the program.

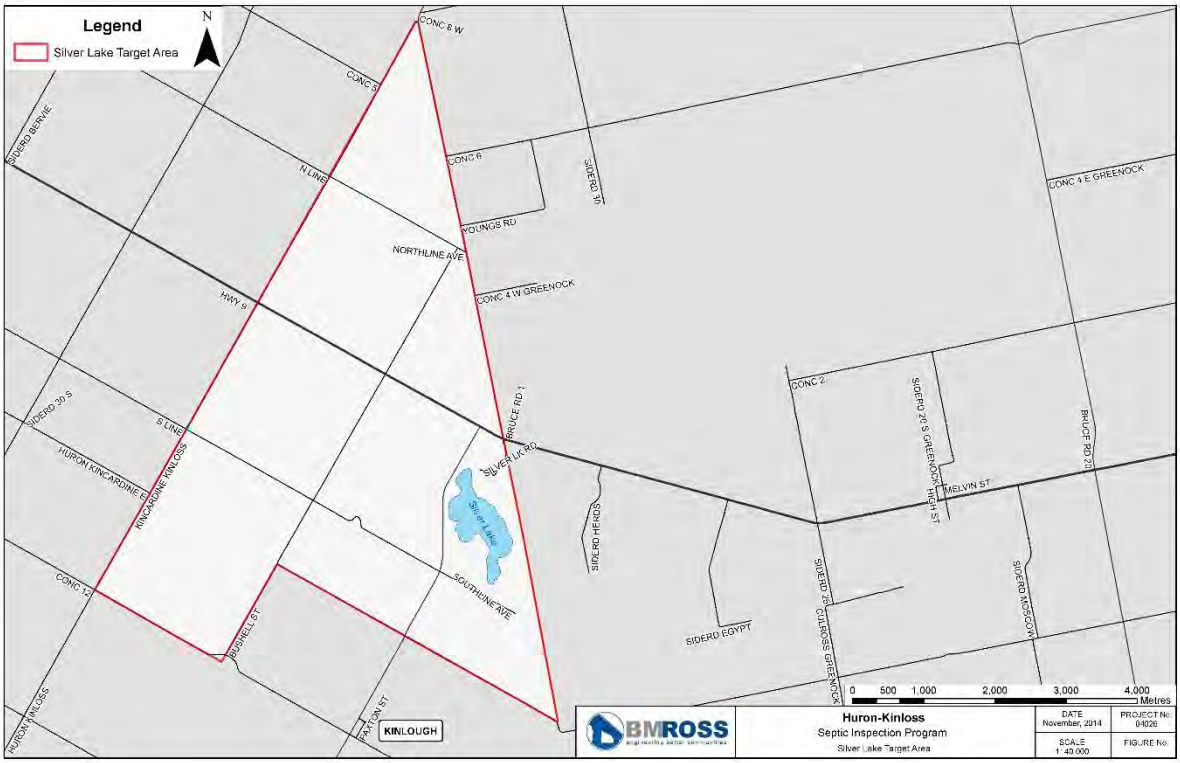
The majority of systems in these target areas are considered medium risk (58%). These systems were given a medium risk rating primarily due to the age of the system. There were 21 systems that required repairs and 14 were identified as non-conforming. A total of 12 systems were identified as high risk, 8 with significant concerns regarding the structural condition of either the lid or tank, and 4 showing evidence of leaching bed problems. Across these target areas, only 30% of the systems were given a low risk rating; a much lower total percentage of low risk systems than what was found along the lakeshore.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	4
High – Structurally Unsafe	8
Medium – Age	60
Medium – Minor Repairs Required	21
Medium – Non-Conforming	14
Low	49

In the NW_Con10_SR20 target area, approximately half of the property owners requiring an inspection, had one completed upon receiving a letter about the program (23 residents). The uptake in the Con10_21_SR20_86 target area was significantly less, with only 19% (23) property owners responding to the initial letter. In the subsequent year, 2011, participation in this target area increased to 28 property owners. A larger proportion of property owners in these targets areas were slower to participate in the program compared to residents in the lakeshore areas. A strongly worded final notice letter, phone calls and doorknocking visits were required in the last year of the program. These efforts resulted in an additional 35 inspections completed in these areas.

4.0 RESULTS BY TARGET AREA

4.12 SILVER LAKE



The Silver Lake target area includes properties surrounding Silver Lake and the lands in the northeastern most reaches of the former Kinloss Township. This area includes a small number of seasonal residences along Silver Lake, permanent residences, farms, as well as a number of camping grounds and a golf course. There are also a number of Mennonite families in this target area. This area was targeted in 2010 in response to concerns about the age and condition of septic systems around Silver Lake.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
117	71	62	9	87%

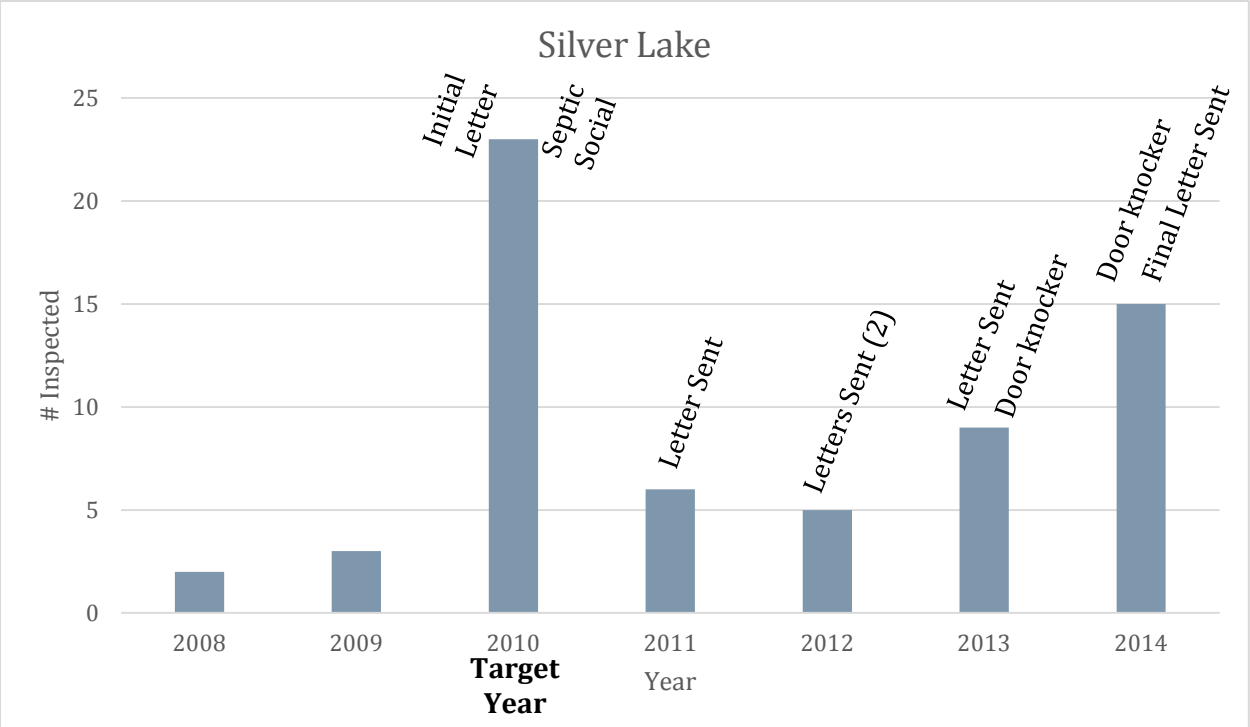
4.0 RESULTS BY TARGET AREA

This is the only target area with less than 90% of required inspections completed in the Township. There are 9 properties in this area that still require an inspection. It should also be noted that there was a property with 8 individual septic systems. Each of these systems were inspected and given a risk rating. In total, there were 8 systems identified as high risk, evenly split between environmental and structural reasons. There were 42 (59%) systems given medium risk ratings. During the inspections, it was noted that there were instances of permits being taken out for greywater systems, the permit cancelled, followed by the property owner installing the system without a permit. In these instances, most of the properties were given a medium non-conforming rating, if the system was functioning. In this target area, there were also two instances of wells located less than 15 m of the septic system. In these instances, a referral to the Ministry of Environment was made.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	4
High – Structurally Unsafe	4
Medium – Age	26
Medium – Minor Repairs Required	5
Medium – Non-Conforming	11
Low	19
No Sewage System	1

4.0 RESULTS BY TARGET AREA

An initial letter informing property owners of the program was mailed out in 2010. Additionally, residents were invited to a septic social held locally, at the home of a Township Councillor. There was a moderate response in the number of inspections completed as a result of the letter and social, with 23 inspections booked. In subsequent years, property owners received letters and doorknockers reminding them of the program; however few residents participated in the program. In 2013 and 2014, significant effort in reaching residents by telephone and doorknocking achieved an additional 21 inspections. Doorknocking efforts were particularly successful with the Mennonite community, members of which could only otherwise be reached by letter.



4.0 RESULTS BY TARGET AREA

4.13 BLAIRS GROVE

The other area targeted in 2010 was Blairs Grove. This target area is made up of the properties between Bell Drive and Concession 6, west of Lake Range Drive. This area includes a significant number of permanent residences, as well as cottages along the lakeshore. Compared to Lurgan Beach to the south and Bruce Beach to the north, residences in this area are relatively newer and situated on larger lots.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
241	183	182	1	99

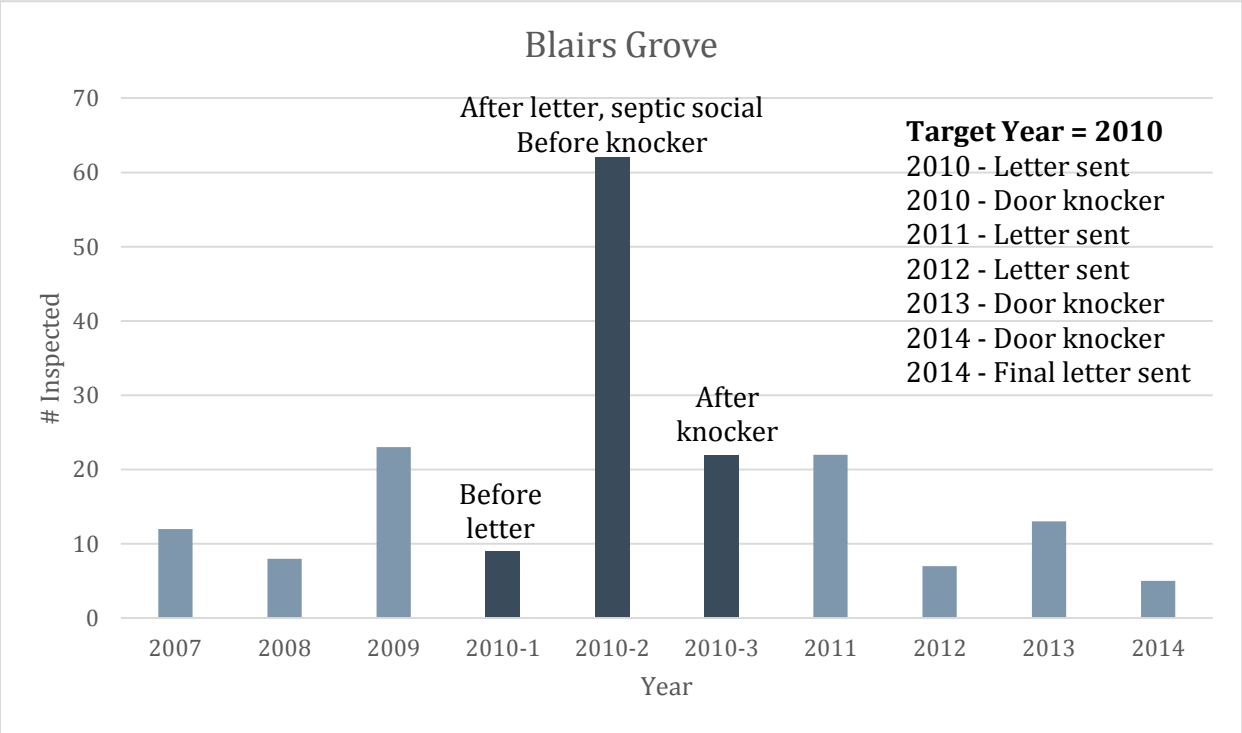
4.0 RESULTS BY TARGET AREA

In this target area, there were 183 properties that required an inspection. At the end of the first round of inspections in 2014, there is only 1 septic system that has not been inspected. Only 1 system was given a high risk rating as a failed bed, which was later replaced. Many of the systems assessed as requiring repairs had either broken baffles or clogged effluent filters. A number of residents were advised of the importance of cleaning effluent filters annually as well as being able to access them. The majority of septic systems, 127 or 69%, in this target area were identified as low risk

Risk Rating	Number of Inspected Systems
High – Environmental Hazard	1
High – Structurally Unsafe	0
Medium – Age	29
Medium – Minor Repairs Required	22
Medium – Non-Conforming	3
Low	127
No Sewage System	1

Prior to this area being targeted in the HKCSI program in 2010, there were 52 inspections completed. Given that the areas surrounding Blairs Grove were targeted early in the program, it is likely that residents were informed of the program. It is also likely that some inspections were completed prior to real estate transactions. In 2010, property owners were mailed an initial letter and a septic social was held at the home of the Mayor. Following receiving the letter and the social, 62 inspections were completed. That same year, residents received another reminder, a doorknocker, which led to an additional 22 inspections. Given this, by the end of the first target year, 74% of property owners in Blairs Grove had participated in the program. The remaining property owners were contacted by telephone, additional letters, and doorknocking.

4.0 RESULTS BY TARGET AREA



The septic social held in this area was very successful in promoting inspections. The keys to the success of the social were the location (the Mayor's home), timing (early July), and local media coverage. Positive media coverage, including photos of the event, were in local newspapers the following week. In following years, doorknocking was also a successful means of encouraging participation, as the majority of residents are permanent and noticed the reminders left on their doors.

4.0 RESULTS BY TARGET AREA

4.14 CON12_CON10_OH, 6_SR20_86_1, TWNLN_SR20_CON10_OH

These target areas include the northeastern area of the former Huron Township (northeast of Bruce 6 and Side Road 20), as well as properties south of Bruce Road 6, between Side Road 20 and Bruce Road 1. These areas are agricultural, with a relatively sparse population. There were 196 properties identified as requiring inspections. Property owners were notified of the program between 2011 and 2012.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
759	195	187	8	96%

A total of 187 septic systems have been inspected across these target areas. The inspections found that the majority of systems in these areas, 58%, fall into the medium risk category. Of the medium risk systems, 74 were assessed as such based on age. These systems, while still functioning, are generally considered undersized by today's standards. It is suspected that in many cases, greywater is diverted away from the septic system and this reduces loads and allows these systems to continue to function. There were 9 systems identified as medium risk, non-conforming. In these cases, the systems are often home-made, installed without a permit or do not follow

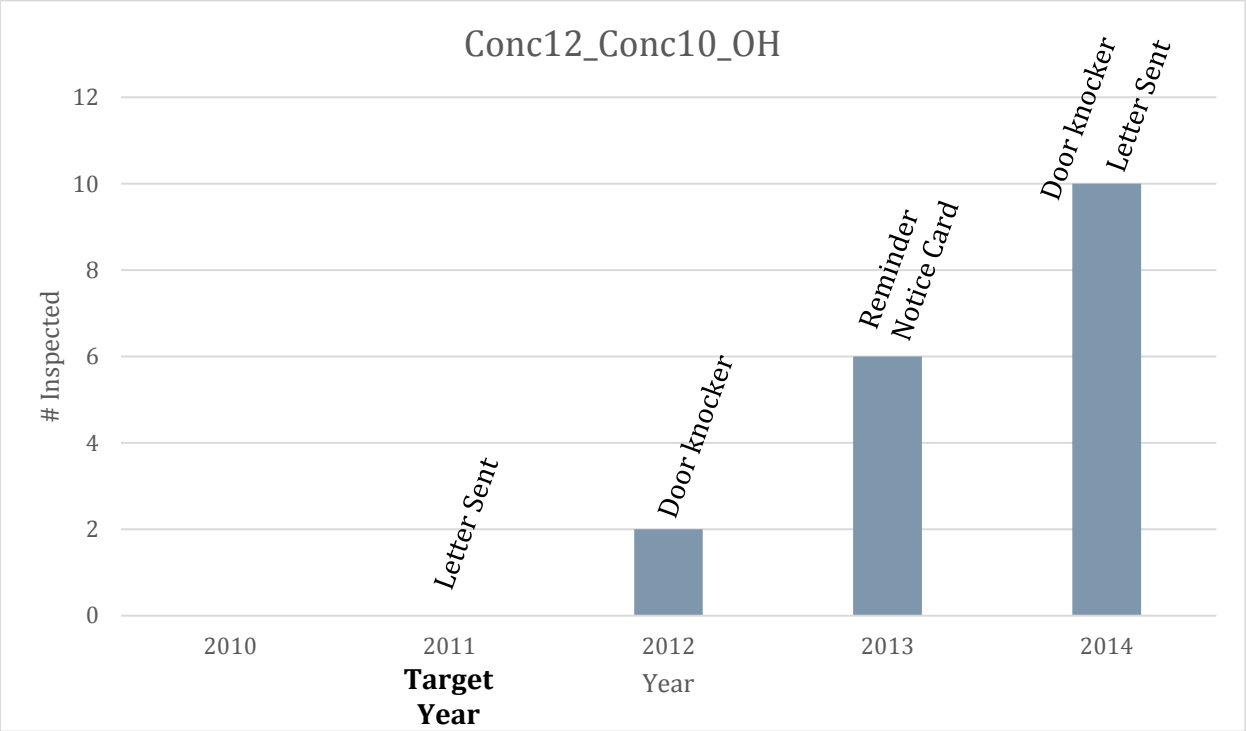
building code specifications, but still function. There were 25 systems inspected that required minor repairs to baffles, filters or the septic tank lid. A total of 16 systems (9%) were given a high risk rating; 6 for as environmental hazards, 10 for the structural condition of the tank. Many of the systems with the high structurally unsafe rating had severely deteriorated lids that posed a risk of collapse. Of the systems classified as environmental hazards, the majority showed evidence of bed failure or broken distribution boxes.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	6
High – Structurally Unsafe	10
Medium – Age	74
Medium – Minor Repairs Required	25
Medium – Non-Conforming	9
Low	63
No Sewage System	3

Participation in the program was variable across these target areas. In the TwLn_SR20_Con10_OH target area, there was a moderate response to the initial letter sent in 2012, with 8 property owners participating in the program. In the following year, after being sent a reminder letter, an additional 7 property owners participated. In 2014, there were only two properties in this area remaining to be inspected and after phone calls and a final notice letter, one of the property owners booked an inspected.

Property owners in the Con12_Con10_OH target area received an initial letter in September 2011. No property owners participated that year. The timing of the letter was likely problematic for the Mennonite community, which makes up a significant portion of the population in this target area. In the following year the Chief Building Official discussed the program with community leaders during an annual meeting. Doorknocking efforts by the inspector in 2013 and 2014 were the most successful method of achieving participation in this target area, as an inspection could be completed at the same time.

4.0 RESULTS BY TARGET AREA



In the 6_SR20_86_1 target area, 50 property owners (34%) completed an inspection in the same year as receiving an initial letter. Additional letters and phone call reminders prompted another 60 property owners to participate. In 2014, a final notice letter and additional phone calls received a relatively strong response with 26 property owners completing an inspection. There are eight outstanding properties requiring a septic inspection in these target areas.

4.0 RESULTS BY TARGET AREA

4.15 HERITAGE HEIGHTS

Heritage Heights is a relatively recent subdivision, located south of Kin-Bruce and north of Concession 10. Homes in this area are generally newer than in other areas of the Township, are on large lots, and were expected to have more modern systems. A number of homes have been recently constructed in this area and the HKCSI inspections were completed in conjunction with Part 8 inspections during construction.

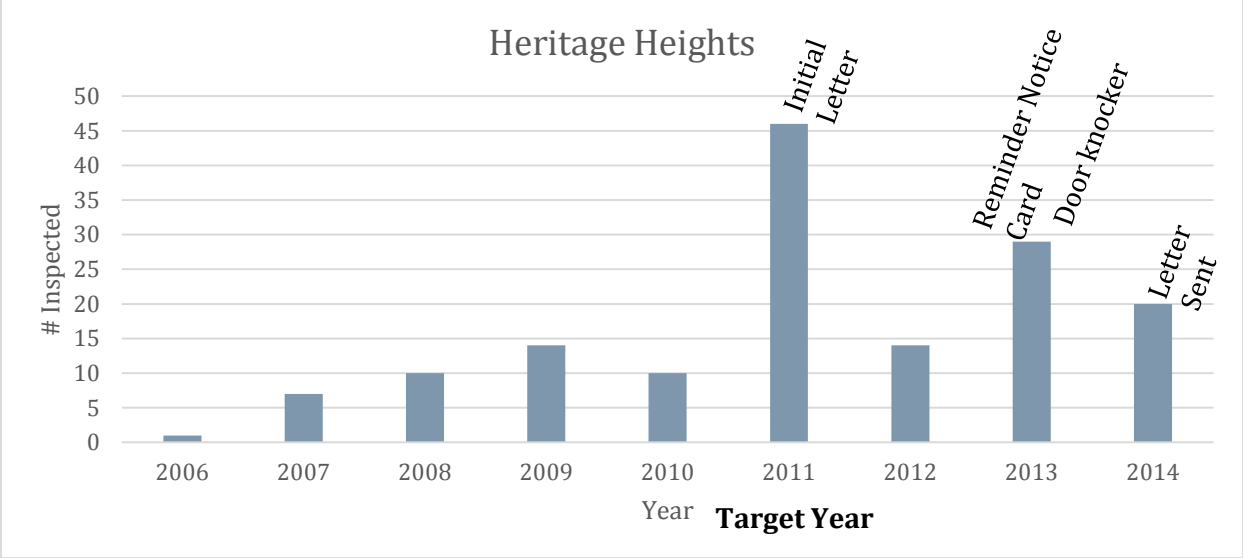
Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
177	151	151	0	100%

4.0 RESULTS BY TARGET AREA

There were 151 properties identified as requiring an inspection under the HKCSI program. By the end of the first cycle of the program in 2014, all the properties in this target area had inspections completed. Given that residences and septic systems in this area are relatively new, it is not surprising that the majority of systems, 86% were assessed as low risk. 16 of the systems inspected required some minor maintenance, mostly related to cleaning effluent filters or replacing baffles. There were two systems identified as high risk; one system showed a blockage to or in the bed and the other had a tank lid in poor condition. Both of these high risk systems underwent repairs following the inspection.

Risk Rating	Number of Inspected Systems
High – Environmental Hazard	1
High – Structurally Unsafe	1
Medium – Age	1
Medium – Minor Repairs Required	16
Medium – Non-Conforming	1
Low	131

This target area was initially targeted in 2011, however, 42 property owners (28%) participated in the program prior to this. The early participation is partly the result of completing inspections at the time of installation for new constructions, as well as real estate transactions. Following an initial letter, 46 residents had an inspection completed. In subsequent years, property owners were contacted by additional letters and telephone calls. In speaking with residents, some residents expressed the opinion that they considered their systems new and wanted to postpone the inspection until 2013 or 2014. These requests were accommodated, and as a result 49 inspections were conducted in the last years of the first round of the program, completing 100% of the required inspections in this target area.



4.16 BBN_LAKERANGE

Properties located east of the Bruce Beach North target area and west of Lake Range Drive, between Concession 6 and 8 were targeted in 2011. This small area includes only 27 properties, 13 of which required inspections. At the end of the first round of program, all the required inspections in this area have been completed.

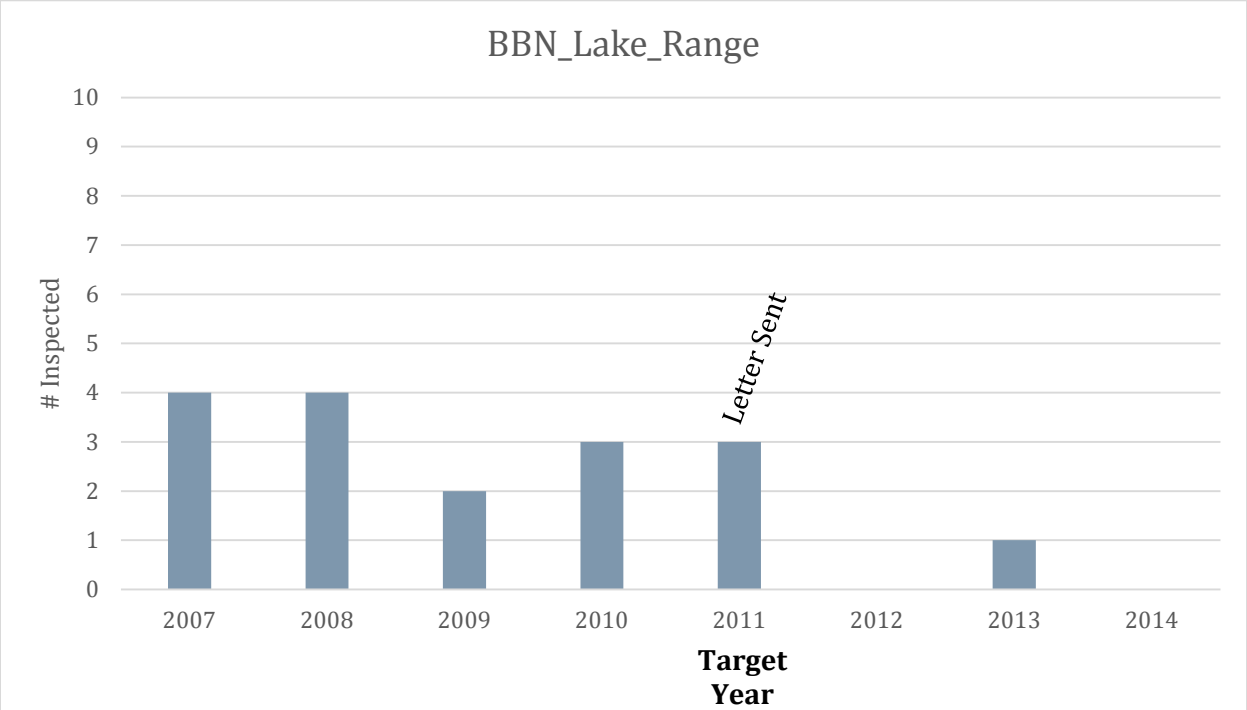
Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
27	17	17	0	100%

In this target area, the majority of systems were identified as low risk. There was one system identified a requiring a minor repair and another as a non-conforming system. One inspection found a system that consisted of a metal barrel for a tank and a pipe discharging over the hill. This system was given a high risk rating and replaced with a proper septic system.

4.0 RESULTS BY TARGET AREA

Risk Rating	Number of Inspected Systems
High – Environmental Hazard	1
High – Structurally Unsafe	0
Medium – Age	0
Medium – Minor Repairs Required	1
Medium – Non-Conforming	1
Low	14

The majority of property owners requiring an inspection in this target area, 13 out of 17, had one completed prior to this area being targeted. An initial letter was mailed in 2011 and an additional 3 property owners participated. The remaining property owner received an additional letter and as well as phone calls before completing an inspection in 2013.



4.17 POINT CLARK NORTH

The Point Clark North target area includes a large portion of the community of Point Clark. Generally, it includes properties located north of Seneca Street to Concession 4, west of Lake Range Drive. The area includes lakefront cottages of various ages and sizes, and many seasonal and permanent homes on lots of various sizes. This was the last lakeshore area to be targeted in the first round of the HKCSI program. It was suspected that a number of old systems would be identified in this area, especially along the lakeshore where there many older cottages.

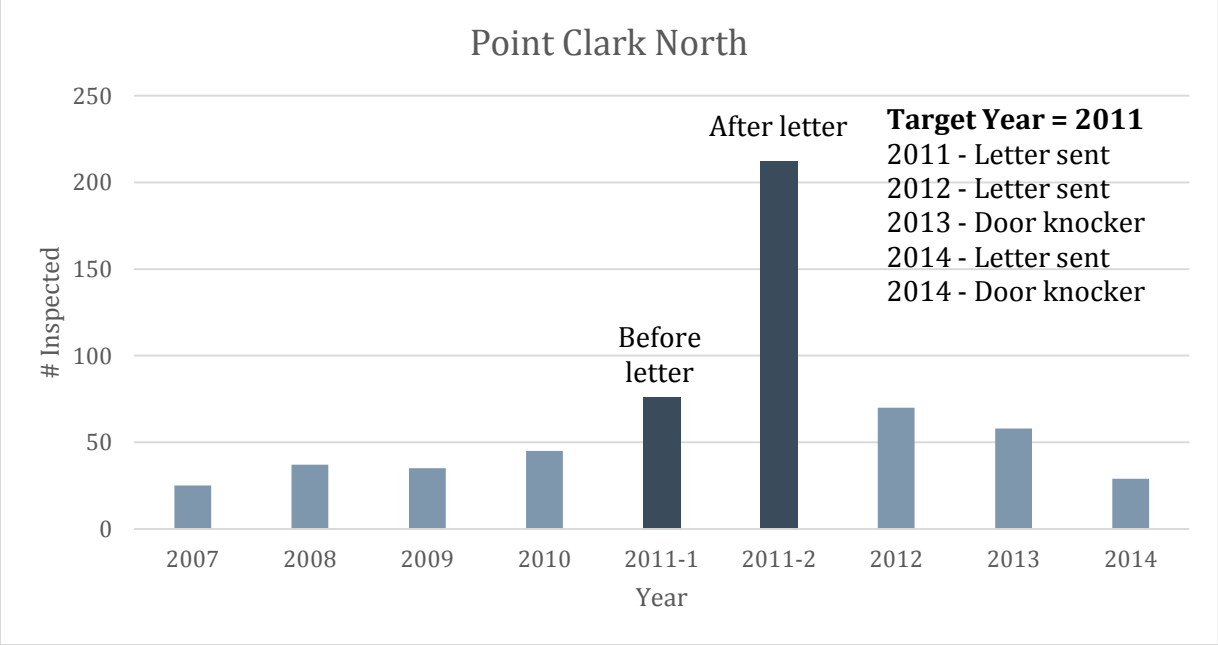
Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
711	587	587	0	100%

There are 711 properties in this target area, of which 587 were identified as requiring an inspection. At the end of the first round of program, all the septic systems in Point Clark North have been inspected. In this target area, there were 27 (5%) systems identified as high risk, nearly evenly split between environmental hazards and being structurally unsafe. The systems assessed as environmental hazards included systems constructed of steel drums, old cesspool systems, one system with a hole in the bottom of the tank and those with failed or failing leaching beds. Inspections resulting in high risk ratings due to the safety of the structure included corroded lids,

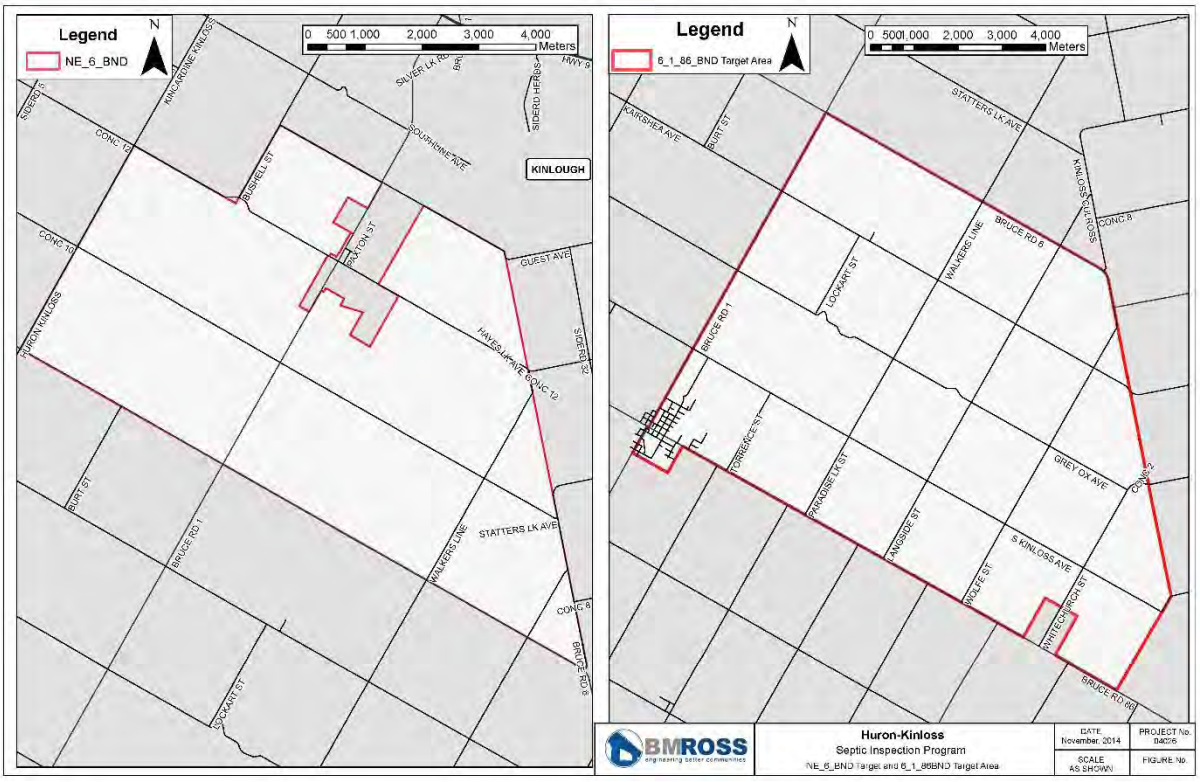
collapsing tanks and cesspools. The remaining systems were almost equally split between medium and low risk ratings. A total of 275 systems (47%) were identified as medium risk – the majority due to age (163 systems), followed by requiring repairs (95 systems) and non conforming systems (17). There were 285 systems (48%) given a low risk rating.

Risk Rating	Number of Inspected Systems
High – Environmental Hazard	12
High – Structurally Unsafe	15
Medium – Age	163
Medium – Minor Repairs Required	95
Medium – Non-Conforming	17
Low	285

Almost half of the property owners, 218, in Point Clark North participated in the program prior to receiving a letter about the program. Similar to other target areas, it is suspected that participation in the program prior to targeting, was driven by real estate transactions and awareness of the program through the media and community. Following the mail out of the initial letter, a significant portion of the remaining property owners, 60%, completed an inspection. The uptake in this area following the initial letter was expected to be around 30%, given uptake in the other target areas. The large uptake contributed significantly to the large number of total inspections completed in 2011. An additional letter in 2012 encouraged another 70 property owners to participate, while another letter and doorknocking in the following year efforts resulted in 56 more inspections. In the last year of the program, the remaining property owners received a final notice letter as well as doorknocker visit by the inspector.



4.18 6_1_86_BND, NE_6_BND



These target areas include properties in the former Township of Kinloss, located south of Hayes Lake Avenue. While these are geographically large target areas, the populations of these areas are only a small part of the total population of the Township. Land in these areas is primarily used for agriculture or is forested. There is also a significant Mennonite population in these target areas. Given the low population and large geographic area, these areas were not targeted until 2011 and 2012.

Total No. of Parcels	Inspection Required	Inspected	Not Inspected	Inspections Completed (%)
1003	295	284	11	96%

Of the 1003 properties in these target areas, only 295 were identified as requiring an inspection. At the end of the first round of inspections, 284 have been completed, leaving 11 outstanding. One property owner in this target area has refused to participate in the program. In these target areas, there were 7 properties inspected, each with two separate septic systems installed. From the inspections, there were 18 systems identified as high risk. Systems rated as environmental hazards in these areas had greywater diverted draining to ditches or basement drains, or blocked

leaching beds. There were 8 systems found with tanks or lids in poor condition. Approximately 51% of the systems inspected were given a medium risk rating. The majority of these, 106, were assigned this rating due to the advanced age of the system. 25 systems required minor repairs and there were 21 systems identified as non-conforming. The remaining 41% were given a low risk rating.

Risk Rating	**Number of Inspected Systems**
High – Environmental Hazard	10
High – Structurally Unsafe	8
Medium – Age	107
Medium – Minor Repairs Required	25
Medium – Non-Conforming	21
Low	120

Participation in the program in these areas followed trends observed in the other later target areas. In each area, some property owners participated prior to receiving a letter about the program. After receiving the initial letter, approximately 30% of property owners had an inspection completed. Reminder letters were sent and telephone calls were made in subsequent years; however, doorknocking proved to be an effective method of encouraging participation in these areas.

5.0 Advanced Sewage Treatment Systems

5.1 ADVANCED SEWAGE TREATMENT SYSTEMS IN HURON-KINLOSS

There are 37 advanced sewage treatment units, commonly known as tertiary systems, in use in the Township. The majority of these systems are located on lots along the lakeshore, where lot size is limited and soil and groundwater conditions dictate additional treatment. The other area these systems are found is surrounding Paradise Lake, east of Lucknow.

These systems are designed to provide advanced treatment of effluent by adding an additional component to the treatment process. The most common systems in Huron-Kinloss are Aquarobic and Ecoflo Biofilter systems, both of which provide aerobic treatment. Tertiary systems require yearly maintenance contracts, which must be completed by an authorized representative of the manufacturer. Property owners who do not comply with the yearly maintenance contract are in violation of the Building Code Act, and are reported to the Chief Building Official. Forgoing yearly maintenance inspections can also impact the treatment process of the system, resulting in effluent from the system not meeting the design criteria.

5.2 INCLUSION IN THE HKCSI PROGRAM

Tertiary systems are required to have an inspection under the HKCSI program, despite the requirement for yearly maintenance and inspections via a service provider. These systems are included in the HKCSI program as it is important to map these systems and ensure that property owners are following the required maintenance contracts.

Historic maintenance records for most of the tertiary systems have been obtained from local service providers. These records are linked to the HKCSI database and can be easily found and checked each year to ensure property owners are complying with the maintenance requirements for their systems. When property owners do not comply with their maintenance contracts, this can be noted in the database and the Chief Building Official can take follow-up action. It should be noted that there were many instances of tertiary systems not working properly and requiring repairs noted in the yearly inspection reports.

In future rounds of the HKCSI program, maintenance contract information for the remaining tertiary will be obtained. Following this, BMROSS will follow up yearly with service providers to confirm yearly maintenance inspections are completed.

6.0 Program Recognition

The HKCSI program has received local, regional and international recognition for its success in changing behaviours towards septic system maintenance. In addition to media coverage, representatives of the program have been invited to speak at numerous conferences, workshops and events. The recognition received during the first 8 years of the program is summarized in the following subsections.

6.1 MEDIA COVERAGE

The progress and success of the program has been extensively documented in local print and online newspapers serving Huron-Kinloss. The yearly status reports to Council were reported upon and annual media releases announcing the beginning of the inspection were often printed. Local media coverage was provided by: The Kincardine News, Kincardine Independent, Kincardine Times, and Lucknow Sentinel. A sample of the headlines about the HKCSI program during the first eight years, including:

- "H-K gets plans for 2007 septic system re-inspections" – Kincardine News, March 2007
- "HK-CSI program gaining popularity" – Lucknow Sentinel, January 2010
- "Huron-Kinloss ahead of curve for septic inspection program" – Kincardine News, January 2010
- "Township's septic system sweep cleans up stinky situations" – Kincardine Independent, January 2010
- "Huron-Kinloss septic program ground breaking"- Kincardine Independent, January 2011
- "Huron-Kinloss recognized for septic inspection program" – Kincardine Independent, November, 2011
- "Township cracking down on septics not yet inspected" – Kincardine Times, March 2014

In March 2012, the HKCSI program and an interview with Project Manager, Matt Pearson of BMROSS, were featured in Pumper, a magazine dedicated to the liquid waste industry. That same issued also featured an editorial about the HKCSI program. Copies of the articles are included in Appendix A.

The HKCSI program was also featured in an article in the August 2013 edition of the Rural Voice. The Rural Voice is circulated to 13,000 Ontario Federation of Agriculture members in Bruce, Grey, Huron, Oxford, Perth and Wellington counties. The article provided an overview of the HKCSI program, including the overarching goals of changing behaviours related to septic system maintenance. Most farmers in Huron-Kinloss receive The Rural Voice and the article helped to promote the program within that community. A copy of the article is included in Appendix A.

6.0 PROGRAM RECOGNITION

Local media coverage is considered important in raising awareness of the program. Positive stories and reports in local newspapers likely encouraged property owners to participate and complete an inspection.

6.2 CONFERENCES

The methodology, results and lessons learned from the HKCSI program have been presented at environmental and stewardship conferences throughout the first round of inspections. In 2011, a presentation entitled, "Love the tank you're with" was given at the 53rd Annual International Association for Great Lakes Research Conference, in Toronto. The presentation highlighted the use of social marketing to create, communicate and deliver programs to influence positive behaviour, such as septic system maintenance. Framed as a case study, the presentation examined how incorporating Community Based Social Marketing techniques into the design and delivery of the program served to foster sustainable behaviour and voluntary participation in a mandatory program. This presentation was part an integral part of a session discussing methods of using science to guide decision-making and influence behaviours.

Also in 2011, the HKCSI was presented as part of the Latornell Conservation Symposium, in Alliston. The theme of the conference was 'Water – the future of the source'. Again, the program was presented as part of a session on stewardship efforts and social marketing. The presentation overviewed the use of CBSM techniques to change behaviours and attitudes towards septic systems and their maintenance.

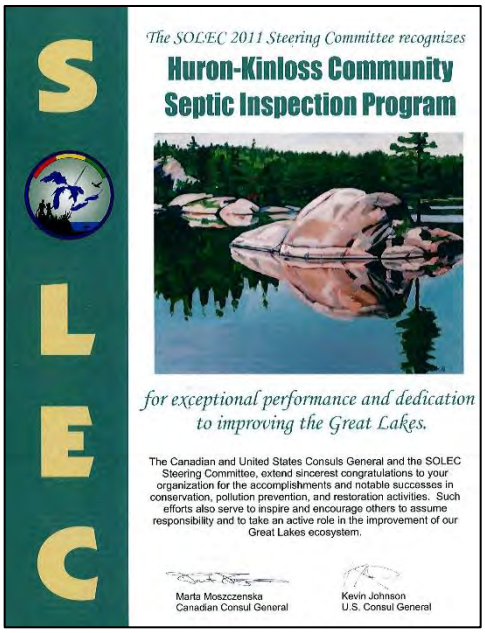
Poster presentations of the HKCSI program have also been given at the bi-annual "Is the Coast Clear?" conferences hosted by the Lake Huron Centre for Coastal Conservation, in 2010, 2012 and 2014. These conferences provide an opportunity for locals interested in learning about the state of the Lake Huron coastline to learn about initiatives and research being done in the area. Attendees include cottagers, permanent residents, local government representatives, municipal staff, public agencies and environmentalists.

6.0 PROGRAM RECOGNITION

6.3 AWARDS

In 2011, the HKCSI program received international recognition after being honoured as a State of the Lakes Ecosystem Conference (SOLEC) Success Story. Chosen out of over 30 other nominations from across Canada and the United States, the award recognized the HKCSI program for its exceptional performance and dedication to improving the Great Lakes. The award was presented to the Mayor of Huron-Kinloss, Mitch Twolan, and Project Manager, Matt Pearson of BMROSS, at an awards ceremony during the SOLEC Conference in Erie, Pennsylvania in October 2011.

Following the conference, an article about the SOLEC award and HKCSI program appeared in the Owen Sound Sun Times.



6.4 SPEAKING ENGAGEMENTS

Members of the project team have been invited to numerous meetings and workshops to speak about the HKCSI program. These speaking engagements provide an opportunity to promote the program and share the lessons learned. The speaking engagements attended include:

- Huron County Water Protection Steering Committee
- Huron County Council
- Waterloo Region Chief Building Officials' Committee
- Grey Bruce Chief Building Officials Workshop
- Haliburton Highlands Stewardship Council
- 2014 Bruce County Water Quality Seminar

7.0 Lessons Learned

7.1 CONSISTENCY

Through the course of the first round of inspections, especially in the early years, the importance of consistency with respect to the inspector became apparent. When a new inspector was assigned to the program, they required training to: operate the handheld GPS unit, upload inspection data, and understand the policies and procedures. This sometimes delayed the start of inspections and required additional resources to train the inspector. Having a consistent inspector improved the overall efficiency of the program, by minimizing training time, issues with using the GPS unit and transferring data, and reducing time on quality control for the data and reports, following inspections.

Having the same inspector year to year was also important in maintaining consistency in the risk assessments assigned to systems during an inspection. Related to the risk assessment, it was also beneficial to have the same inspector conducting follow up visits to verify repairs or replacements.

7.2 INTEGRATION WITH PART 8

In 2011, the Township of Huron-Kinloss assumed responsibility for installations and repairs made under Part 8 of the Building Code. Following this, the procedure for the installation of a new septic system was integrated with the re-inspection program. The same inspector provided lot and installation inspections for Part 8, as well as inspections for the HKCSI program. Integrating the two programs streamlined data sharing and management as the information required for the re-inspection program, such as GIS coordinates of system components, could be collected during the installation of a system. Following installation of a new system, property owners received permit information as well as an inspection report, or updated version in the case of a system replacement. For the HKCSI program, integration with Part 8, allowed for better tracking for repairs or replacements of high risk systems. Additionally, integrating the two programs eliminated instances of property owners being contacted about an inspection shortly after having a new system installed.

7.3 COMMUNICATION AND DELIVERY

At the outset of the HKCSI program, a number of barriers to participation in a septic system re-inspection program were identified. These barriers were revisited throughout the program to determine their prevalence and the effectiveness of measures designed to address them. The table below summarizes the barriers identified and lessons learned in address them.

7.0 LESSONS LEARNED

Table 7.1 Barriers to Participation and Lessons Learned

Barriers	Lessons Learned

• Cost
  • Pump-outs
  • Possibility of repairs/replacement
  • Additional tax on tax bill
	• Cost of inspection was included with taxes, so there is no upfront costs to users at time of inspection. This was the most important strategy in addressing this barrier.
	• In the initial target letters to property owners, it was suggested they could coordinate pump-outs for potential savings. Generally, it was found that most residents preferred to schedule a pump-out at a time convenient for them. On average, there were 5 instances per year where property owners coordinated pump-outs and inspections with their neighbours.
	• During inspections, the inspector was able to provide on-site education about the importance of pumping and maintenance in keeping systems functioning. By showing property owners maintenance techniques (like cleaning effluent filters annually), the inspector was able to address fears with respect to future inspections resulting in replacements.
	• Properties were assessed $55 per year on tax bill. This amount did not generate a large response from taxpayers. Spreading the cost of the inspection out over an 8 year period reduced the financial barriers to property owners.

• Privacy – having inspector on property	• Most property owners did not have major privacy concerns with having the inspector on their property. When booking appointments, property owners were given the inspectors name so they would know whom to expect. • The inspection process was also briefly outlined in the letters sent out to assure residents that the inspection is non-invasive. • Property owners were also strongly encouraged to be present for the inspection.
• Owner absence – rented homes, cottages	• Having a flexible inspection schedule, including weekend appointments and appointments later in the year provided the opportunity for property owners to have an inspection completed and be present for it. • There were some difficulties getting alternative contact information for property owners with rental units (such as a phone number); however often tenants would provide contact information during door knocking visits.

7.0 LESSONS LEARNED

Barriers	Lessons Learned
• Lack of knowledge regarding septic systems (working condition, location, age)	• This barrier was experienced occasionally and for the most part due to the age of the system, ownership changes (often through inheritances), or the death of the primary property caretaker. It was a factor and prevented some property owners from completing inspections initially. • Offering assistance to locate the system, either through a review of historic permits or having the inspector visit the property, were effective means of addressing this barrier. • Providing an aerial photo of the property with the septic system mapped on it should effectively eliminate this barrier in future inspection cycles.
• May not see improvements in water quality, nutrient pollution problems	• To address this barrier, education material was designed to ensure the public was informed that inspections are a step in a wider community approach to environmental stewardship. Yearly updates to Council about the program were presented with the results of the water monitoring programs. • The HKCSI program was included with other environmental stewardship initiatives at two 'Environmental Day' events. These events promoted the efforts of all local environmental initiatives. • There have been improvements in water quality, as observed in data from the local water monitoring programs and in future inspection cycles, this will be promoted.
• Misconceptions on inspection process	• Some property owners expressed concern about the invasiveness of the inspection. • To address these concerns, the inspection process is briefly outlined in the letters property owners received. The inspection is described as non-invasive and only requires property owners to expose the lids of the septic tank. • Additionally, demonstrations of inspections were held at Septic Socials and the Environment Day events. These demonstrations were very effective in eliminating misconceptions about the inspection process.

7.0 LESSONS LEARNED

Throughout the first round of inspections, the methods of communication used as part of the program were evaluated and assessed. The initial form of contact for all property owners is a letter informing them of the program and encouraging them to participate. Over the course of the program, the letter was revised to emphasize the most important information by using bold typeface and frames around specific directions to property owners. In the future, having the property requiring an inspection identified on letters may be beneficial, especially for owners with multiple properties.

Following receiving a letter, property owners who did not book an inspection received a doorknocker. The doorknocker was either given to property owners or left on a doorknob. Doorknocking was used throughout the Township, with varying degrees of success. It was more effective in rural areas compared to the lakeshore, especially at seasonal residences. It was also most effective if done by the inspector instead of other project staff. Having the inspector conduct the doorknocking resulted in more owners completing inspections. This is partly due to the inspector being able to complete an inspection when doorknocking and also likely due to perceived gravitas of having the inspector visit. Timing of doorknocking was also important. Doorknocking was most successful outside of working hours along the lakeshore. It was also more successful in rural areas during the summer or very late fall, away from harvest times. This method of communication was the most successful method with the Mennonite community.

In addition to doorknockers, property owners were also contacted by telephone. This method of communication was limited by the availability of telephone numbers. Property owners were called and reminded of the program, either when spoken to or by leaving a message if possible. Calls were often made during typical working hours. Later in the program, calls were made in the late afternoon and evenings in an attempt to reach more residents. Late afternoon and evening calls were more successful in reaching property owners. Residents often booked appointments after 2 or 3 phone calls or messages. It is noted that the general trend towards cellphones and away from landlines may impact how this method is used in future rounds of inspection.

Septic socials were utilized as a method of breaking down barriers held by property owners and getting inspections completed. Between 2007 and 2011, 8 septic socials were held. Six were held in the lakeshore area, one in the Silver Lake target area, and one in the West of 21 target area. The success of septic socials in influencing behaviours (and resulting in inspections) was largely determined by the type of community where the septic social was held and the timing of the event. Septic socials in the lakeshore communities, where the existing community was tight knit, or linked by a common bond such as cottage association, were the most successful in changing attitudes and encouraging inspections. Timing was also important, as demonstrated by the response to the Lurgan Beach septic social. The septic social was held in mid August, too late to influence the seasonal population of the area.

7.0 LESSONS LEARNED

Communication between BMROSS, the program administer, and the Township was also very important to the success of the program. Township staff booked inspection appointments, answered questions, and managed requests for information. Additionally, the staff provided feedback to BMROSS regarding frequently asked questions or concerns from the public.

7.4 DATA MANAGEMENT

Data management is a considerable component of the administration of the HKCSI program. Significant effort and time is required to properly manage the information, especially in the development of a database. The HKCSI database has been modified as the system progressed to include a repair database (added in 2009), tertiary system inspection records, produce statistics and reports, and maintain a history of septic systems repairs and replacements. The program started with storing inspection related data within the Parcel polygon layer of the GIS. This became an issue since parcels are added and subtracted each year based on severances, subdivisions and lot merges. The method to make sure the correct inspection data was transferred to the new parcel layer, which was updated annually, was to create a join based on roll number. It was also discovered that a roll number does not necessarily remain constant during activities like severances, and the assigning of roll numbers is not a municipal function and therefore out of the control of the program. By switching to storing inspection data to a point feature in the GIS, data is not lost during the manual data transfer process.

The situation of multiple septic systems on a property was not built into the original design of the database. The storage of data connected to a parcel allowed for only one record related to risk assessment and evaluation data, making comments that related to two systems was confusing. Each system now gets its own inspection record and the septic tank and bed details are related to the correct inspection data through a unique inspection ID.

The database also stores the records of communication with property owners, which allows project staff to consult previous communications while speaking with property owners. This has been a useful tool for reminding property owners who were slow to participate of the efforts made to reach them.

Moving forward, the database will be modified to store future inspection data. From the database, the project team will be able to compare data from past inspections to evaluate how systems are performing, whether or not repairs are being made, how system usage is changing, and when and where systems are being replaced.

8.0 Moving Forward

8.1 CYCLE 2 – YEARS 9 TO 16

The first cycle of the HKCSI program achieved many of the goals that were envisioned in 2006 when the program was first designed:

- It put into place a methodology to initiate a change in culture, property owners' understanding, and maintenance practices for septic systems;
- Gathered and managed as much information as possible regarding septic systems in the Township;
- Identified poorly functioning systems, leading to repairs and replacements;
- Provided continuing education and knowledge enhancement for the public.

It is important to understand that the first cycle of inspections is essentially one 'look'. An inspection represents the state of the system on the day it is inspected. The systems looked at in 2007 are close to a decade older than they were on the day they were inspected. This is about one third of the expected life of a system (approximately 25-30 years). Septic systems are not expected to last forever; over time the components break down, and leaching beds develop bio-mats from the microbial action. Environmental standards are revised constantly as knowledge increases, and systems built over 30 years ago no longer meet current requirements. The decline of a system will not be linear. Systems often gradually degrade, but eventually there will be an abrupt failure.

An in-depth review of the risk assessment statistics supports the need for a continued inspection program. In the initial cycle, 52% of the inspected systems were given a low risk rating, as they did not require any repairs and were under 25 years in age. By the end of the second cycle, half of these systems will have a minimum medium - age rating, as they will be older than 25 years. Some will likely require repairs and some may fail for various reasons. More disconcerting are the systems currently rated as medium – age. The average age of these systems is 43 years. As the older systems in Huron-Kinloss continue to age, it is assumed that major issues will arise in the future.

8.2 SOURCE WATER PROTECTION

The Source Protection Plans that are expected to be implemented in the Township include policies that require a septic inspection program for vulnerable areas where "the establishment, operation of maintenance of a septic system is or would be a significant drinking water threat (existing or future activity)" (Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region Proposed Source Plan, 2012). These areas have been identified as part of the HKCSI program and

include: Point Clark WHPA, Blairs Grove WHPA, Whitechurch, and Murdoch Glen WHPA. Under Source Protection Policy, these areas will require inspections on a 5-year cycle.

These requirements can be met through the HKCSI program and can easily be integrated with the program. The data management system used for the HKCSI program will allow project staff to monitor these properties and ensure that they are inspected on a 5-year cycle. Additionally, the HKCSI program has established a positive precedent for inspections in these areas, which will assist with interactions with property owners.

8.3 UNINSPECTED PROPERTIES

There are 50 properties that have not been inspected as part of the HKCSI program to date. This includes 6 properties that currently have pending septic system permits and 3 properties where the owners have refused to participate. At the outset of the second inspection cycle of the program, the list of uninspected properties will be reviewed. The review will identify if any of the properties have changed ownership or status, such as having the residence demolished. If any of the properties have changed hands, new owners will be notified of the requirement to participate in the program.

Following the review, property owners will be sent a notice indicating that if an inspection is not completed within 30 calendar days, that an order for an inspection from the Chief Building Official will be placed on the property. Following issuance of the order, if no action is taken, the inspection will be completed and the cost of which will be charged to the property as a lien.

8.4 FOLLOW UP ON REPAIRS REQUIRED AND HIGH RISK SYSTEMS

In the second cycle of the HKCSI program, there will be a focus on following up with properties owners to check that recommended repairs have been completed and high risk systems repaired or replaced. In most instances, when high risk systems were identified, property owners either had the system repaired or replaced; however, there are 32 systems inspected since 2009 that remain assessed as high risk. Most systems that required minor repairs needed baffles replaced, filters cleaned or trees removed from the bed area.

Priority will be placed on ensuring that systems identified as high risk are repaired or replaced. The inspector will inform the Chief Building Official of any high risk systems that may an Order under the Building Code to ensure issues are addressed. Repairs identified during the first round of inspections will be monitored during the second round to determine if the recommended repairs were completed.

9.0 Summary

The Huron-Kinloss Community Septic Inspection Program has completed its first cycle of inspections. Over the eight year cycle, 2,940 inspections were completed and data was collected regarding the conditions and details of these systems. Using this information the systems were assigned a risk assessment rating. Approximately 50 properties (1.7%) have not had an inspection completed for various reasons. Acceptance of the program and cooperation of property owners was very high with only three owners refusing to participate. This program is mandatory under a municipal by-law, and non-participating property owners will be dealt with under the appropriate legislation.

Although mandatory, the Program was conducted using a voluntary-cooperative approach. This was successful as property owners had their systems pumped out, made an appointment, and attended the inspection. This allowed them to gain knowledge from the inspector about their septic system, its operation, and maintenance techniques like cleaning effluent filters. Other education opportunities, such as septic socials, Environmental Days, information pamphlets, and interactions with the inspector, contributed to the success of the program.

The program identified 4-5% of the inspected septic systems as being seriously compromised with a requirement for owners to replace the systems. Systems requiring repairs (420 systems) were also identified. The repairs were discussed with property owners and identified in the inspection report. Repairs to these systems will allow them to function properly and last until a total system replacement is required. The program instituted a system to follow up on these repairs on a voluntary basis, which has worked well. These repairs will be subject to follow up during the second round of inspections.

The program cooperated with Source Water Protection initiatives that were introduced in high risk areas near municipal wells. Many property owners in these areas were able to access funding to undertake repairs to their systems. The program will introduce some flexibility in its inspection cycle going forward so that properties required to be inspected under Source Protection Plans every 5 years, will be accommodated.

A significant number of septic systems in the Township have surpassed the expected life of a system. Almost fifty percent are older than 25 years. The average of a system given the medium-age rating is 43 years. One of the reasons that systems have reached these ages is that the lakeshore area of the Township was, for many years, a predominately seasonal area. Usage has expanded to multi-seasonal and permanent and it is expected that many of these older systems are strained under higher usage. We would expect an increasing trend to problems and failures as the systems age. Given the soil types and small lots in many areas of the lakeshore, we also expect a number of the replacement systems will be advanced treatment units (tertiary systems). These are more complicated, require annual inspections and sometimes sampling, and it is imperative

that they are properly maintained. If these systems fail to operate as designed, it leads to environmental issues.

Finally, the HKCSI program is really an asset management plan. The assets are the septic systems, and while they are on private property, the Township is responsible for issuing them a permit and making sure that they operate in the future. Failure to operate as designed can lead to environmental and public health issues and even the loss of the ability to inhabit a residence. At an average, conservative cost of $15,000 per system, there are $45,000,000 in systems present in the Township. The cost of the HKCSI program, with two pump-outs over the eight year cycle, equates to an annual cost of about three-quarters of one percent of the value of the asset. The HKCSI program represents good value for property owners and good due diligence by the Township.

All of which is respectfully submitted.

B. M. ROSS AND ASSOCIATES LIMITED

Per _____

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Senior Planner

Per _____

Lisa J. Courtney, M.Sc.

Environmental Planner

10.0 References

Saugeen, Grey Sauble, Northern Bruce Peninsula Source Protection Region. (2012). *Proposed Source Protection Plan.*

B. M. Ross and Associates Limited (BMROSS). (1997). *Township of Huron – Risk Assessment Study for Continued Development on Septic Systems in Lakeshore Area.*

APPENDIX A

MAGAZINE ARTICLES

Matt Pearson may be reached at 519/524-2641.

SUCCESSFULLY MANDATING INSPECTIONS

TO IMPROVE LAKE HURON WATER QUALITY, RESIDENTS OF A CANADIAN TOWN ACCEPT A NEW TAX AND COOPERATE FULLY WITH REQUIRED SEPTIC SYSTEM CHECKS AND MAINTENANCE

By Scottie Dayton

Looking at algae blooms washing ashore reminded residents of Huron-Kinloss, Ontario, of when Lake Huron was pristine. They didn't like seeing the mucky mess and the health department closing beaches to swimmers. They demanded action from the Township Council.

Officials turned to their civil engineering firm, B.M. Ross in Goderich, to design a septic inspection program. Although the firm had 10 years of water quality data showing onsite systems and agriculture were equal polluters, it focused on septic tanks after researchers found high *E. coli* levels in a stream not connected to farming and running through the middle of Point Clark.

"We concluded that the cause was probably partially remediated septage leaching into the sandy soil and the high water table flushing it out," says environmental planner Matt Pearson.

The community accepted the responsibility of owning sewage treatment plants in their back yards and endorsed the inspection program voluntarily. It was recognized at the 2011 State of the Lakes Ecosystem Conference for protecting the quality of the Great Lakes.

***Pumper*:** How many onsite systems are in the township?

Pearson: We have 2,800 systems serving 6,500 permanent residents and 3,500 seasonal ones along 12 miles on or near the southeastern side of Lake Huron. Our densest populations are in Point Clark at the south end of the lake and near the town of Kincardine at the north end. Lucknow and Ripley, serviced by sewers, are the largest inland towns. The rest is farmland and wooded areas.

Our septic scene has changed over the last 20 years. Many retirees have converted seasonal cottages to year-round homes and developers built large subdivisions near the lake. The Ministry of Environment was concerned about pollution from the onsite systems, so we did a risk assessment of continued development. The systems seemed to be working. The caveat is once they are approved, no authority checks that they are being maintained.

***Pumper*:** What are the most common types of onsite systems?

Pearson: Most are traditional septic tanks with stone beds. About 1 percent have been replaced with peat moss biofilters. New construction in clay soils favors raised mounds with leach fields.

***Pumper*:** What were the parameters of the inspection program?

Pearson: The idea was to have everybody in the township participate, including the 35 percent who are seasonal. We planned the program over seven or eight years to ensure that inspections were done correctly. We also change the target locations every year so people recognize the program and associate it with our advertising.

If communities do something like this, it's important to change people's attitudes from "I've gone 10 years without a pump-out and probably don't need one" to "I need to have the tank pumped." Education is always part of the plan because homeowners should understand what is happening and why.

Communities also must identify barriers that will prevent people from participating. The biggest one is usually money, followed by the fear of having their yard torn up. Handing homeowners a $400 inspection bill is sticker shock, so we proposed and they accepted a $55 increase in their annual township taxes to cover the cost of the program.

> **"IN 2011, WE MAILED 800 LETTERS EXPECTING 400 APPOINTMENTS, BUT 75 PERCENT RESPONDED. PEOPLE WERE SIMPLY WAITING THEIR TURN. WE DID 600 INSPECTIONS, BREAKING OUR RECORD OF 470, BRINGING THE TOTAL TO 2,000."**
>
> **Matt Pearson**

Pumper: How did you implement it?

Pearson: We began in 2007 with 400 inspections. The key was involving people by mailing notification letters that asked them to call for an appointment. Fifty percent responded. The letter also explained that the inspector needed to see inside the tank and that required calling a pumper – and they did.

Because it's an important job, we hired an inspector from our Grey Bruce Health Department. We wanted a qualified person interacting with the public, and most inspectors are environmental technologists from colleges or universities.

During the inspection, they remove the lid and examine the tank with a camera, take a history of the system and family practices, and try to find the drainfield. Ontario didn't begin issuing Certificates of Approval until 1976. B.M. Ross worked with health officials to match upgraded systems with original certificates and to spatially map them.

After the inspection, we mail a package with educational materials and an aerial photo showing the location of the onsite system. Homeowners really like that. The package also includes the inspection report, a risk rating, a pump-out log, and a copy of the original Certificate of Approval, if we found it. We also tell them to leave the package for the new owners if they sell the property.

***Pumper*:** How did you handle residents who didn't make appointments?

Pearson: We sent a university student to their property the next year. If they weren't home, she hung a reminder on the door. Half the people responded, giving us 75-percent voluntary compliance in two years. After that, students phoned, which meant finding numbers because many owners lived out of the area.

Mainly, people didn't participate because they set the notice aside and forgot about it or were away for the year. After five years, we have almost 100 percent compliance in the early target areas without chasing too hard.

In 2011, we mailed 800 letters expecting 400 appointments, but 75 percent responded. People were simply waiting their turn. We did 600 inspections, breaking our record of 470, bringing the total to 2,000.

***Pumper*:** What is the percentage of low-, medium-, and high-risk systems?

Pearson: From 2007 to 2010, inspectors rated 59 percent or 1,652 systems at low risk, 37 percent or 1,036 at medium risk, and 4 percent or 112 requiring replacement.

***Pumper*:** What are the most common problems on mid-risk systems?

Pearson: Broken or missing outflow baffles and clogged effluent filters. Filters became mandatory in 2006, but most people don't know they have one. We show them how to clean and replace the filters. We find crumbled concrete lids and buildings, trees, and even a croquet court on the drainfield. Risers weren't popular until 10 years ago, so we suggest to homeowners that they have them installed – and they do, after we explain that spending $400 now can save them thousands of dollars later.

***Pumper*:** What is your relationship with pumpers and installers?

Pearson: Solid. Early on, we met with the five pumping services – two also do installations – and gave them brochures about the program to hand to their customers. They lend components for us to show on demonstration days, and they have been very helpful informing us about their work. We're tracking all repairs and entering them in a spatially mapped database. We're also asking homeowners to send a copy of their repair bills, and compliance is high.

***Pumper*:** What advice would you give communities wanting to start an inspection program?

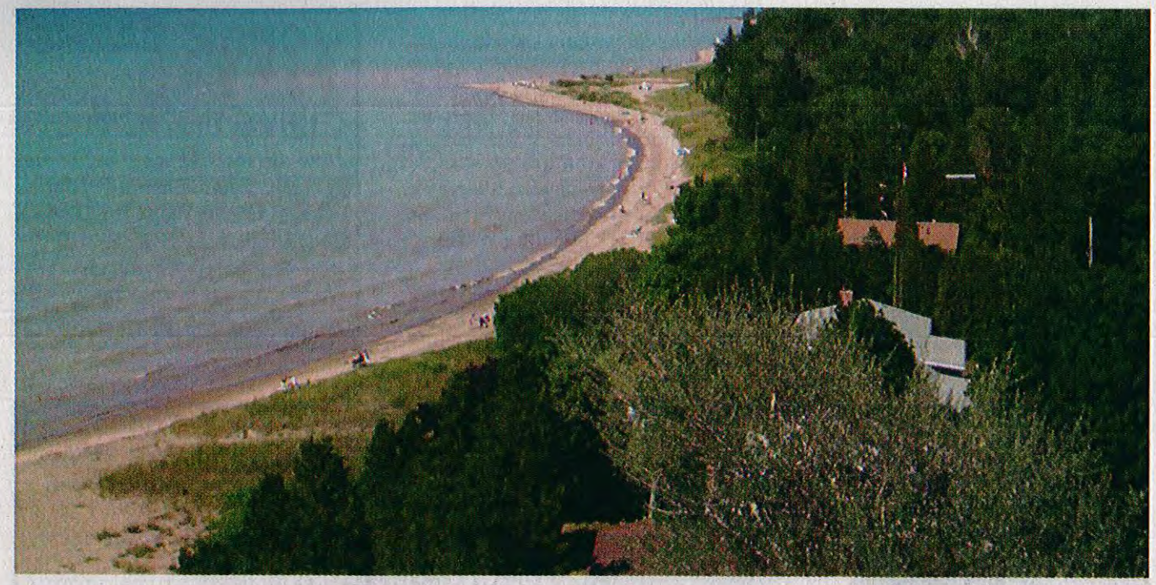
Pearson: Keep it at the local level or risk bogging down in politics and going nowhere. There is no reason to make it bigger. Don't waste the opportunity to gather all the information you can. Manage it with GIS connected to properties so you can use the data for other things.

What we've seen are small communities believing they can manage everything. In truth, they don't have the resources. Hire the data management, the graphics, the marketing. Is it expensive? Yes, but consider this: We've been working with the same $55 per property or $165,000 a year for five years. After the first year, the initial startup expenses were gone and we became more efficient.

Communities must think of onsite systems as assets. Ours are valued at $10,000 to $15,000 each or $20,000 if it's a biofilter. Multiply $15,000 times 3,000. We're spending $165,000 a year to maintain $45 million in assets or 0.33 of a percent on inspections. If everybody pumped their tank once during the program, we might have another 0.33 of a percent. Spending two-thirds of 1 percent a year to maintain an asset is pretty cheap.

That's the real key to this program. It's not subsidized by anybody. You own this asset; it's your responsibility to take care of it. ■


The Rural Voice
THE MAGAZINE OF AGRICULTURAL LIFE AUGUST 2013 $2.50 PM 40037593
PIGS TO RABBITS
Young couple finds their experience with pigs helps with a different livestock
HIDDEN ASSET
Tips on protecting your septic tank investment



HIDDEN ASSET/HIDDEN DANGER

Buried underground as it is, it's easy to forget you've got a lot of money invested in your septic system, and that if it isn't working properly the environment may pay a big price

By Pamela Scharfe

The Lake Huron shoreline, seen from the Point Clark lighthouse, (top) shows the close proximity of cottages and homes, and their septic systems, to the lake. Directly above, a new double chamber septic tank has risers to make it easy to access the tank for pumping and annual cleaning of the filter.

Do you know if your septic system is working properly? If you can't answer this question, says Matt Pearson, then you may be ignoring one of the most important and expensive assets of your rural home and may be endangering your family's health and possibly contaminating nearby groundwater and surface water sources.

Pearson is an environmental planner and a partner with B.M. Ross and Associates Limited of Goderich which has been working with The Township of Huron-Kinloss on an ongoing program to reinspect existing septic systems.

He notes that in Ontario where municipal sewers are not available, you are required to have a septic system to dispose of human sewage and are responsible for the system's maintenance and performance. Municipalities are responsible under the Ontario Building Code (OBC) for inspecting and approving septic systems. The legislation also allows a

An inspector found this barrel was being used as the septic tank and even the metal lid was corroded.

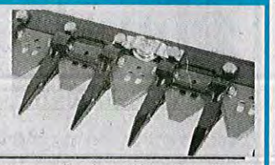
municipality to delegate the inspection and approval of septic systems to a third party, which Huron-Kinloss did to B.M. Ross and Associates.

It is estimated that in Ontario there are over 1.2 million onsite septic systems, with this number increasing by 25,000 per year. The majority of rural homes rely on a septic system that consists of a tank and a leaching bed known as a Class 4 sewage system under the OBC. However, others also use a pit privy or pail privy system (Class1) and/or a grey water sewage system (Class 2); cesspool (Class 3); or a holding tank (Class 5).

Costs for onsite systems are highly variable, says Pearson, depending on a number of factors including: aggregate proximity and cost, soil type, gravity versus pumped, house size and number of fixture units and bedrooms in the home. A typical installation of a conventional in-ground gravity system for a three to four bedroom house can be anywhere in the range of $5,000 to $10,000. A typical installation of a conventional fully raised gravity system for that same three to four bedroom house can be in the range of: $9,000 - $20,000. An advanced treatment system for a typical three bedroom home will range from $8,000 to $20,000 plus annual maintenance contract costs.

A properly functioning septic system provides a safe, reliable way of treating your household wastewater; however a septic system is like any other equipment in your house – it has to be maintained.

"A failed septic system will inadequately treat sewage and may



cause groundwater contamination as the pollutants leach into the groundwater or into surface water courses," said Pearson. "Human health and drinking water could be threatened if pollutants reach your own or neighbouring wells."

If you operate and maintain the system responsibly, a conventional system (Class 4) should last 25-30 years or more depending on whether or not it is used year round or only for seasonal use.

"Regular inspections are important for the proper maintenance of a septic system and can identify on-going or potential problems," says Pearson. "Ongoing maintenance of a system can increase the lifetime of the system and save you money in the long run. Repair costs can range from a few hundred dollars for pumping out the tank to several

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thousand dollars to replace a clogged leaching bed."

He outlines some signs of problems or failure of an onsite septic system:
- sewage ponding in the leaching bed area;
- sewage back-up into the house;
- sinks and toilets are draining slowly;
- sewage odours;
- spongy or mushy ground in the leaching bed area;
- lush green growth or uneven growth of grass on the leaching bed.

Pearson says it's now common practice as part of real estate transactions and mortgage renewals to require that property owners who rely on a septic system to provide information about the condition of the system. Information typically required is the age of the system; a copy of any permits or inspection reports issued; that there are no outstanding work orders regarding any components of the system; and when the septic tank was last pumped. At time of sale, inspection may also be required which might involve pumping the tank and examining the leaching bed for any signs of problems. This type of inspection may be conducted by a licensed septic system installer, a licensed sewage hauler, or a professional engineer.

Buyers, realtors and financial institutions also now accept septic reinspection reports that are carried out by municipalities that have initiated reinspection programs of existing septic systems to address water quality concerns.

That's what Huron-Kinloss has done in hiring B. M. Ross to design the Huron-Kinloss Community Septic Inspections Program. Initiated

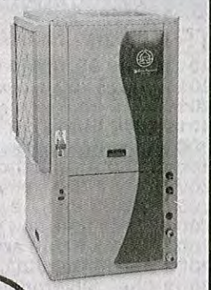
Real estate sales and mortgage renewals often now require information about the condition of septic systems.

in the spring of 2007, the program aims to encourage regular maintenance of septic systems through mandatory inspections with every system being inspected on a rotating basis over an eight-year period.

"The program was designed using Community Based Social Marketing as the underlying platform to involve property owners in the protection of the environment," says Pearson. "The administration of the program (design, correspondence, GIS, deficiency follow-up) is carried out by B.M. Ross in co-operation with the Township."

Septic systems are a common method of wastewater treatment and disposal in the Township with approximately 2,900 private onsite septic systems along the lakeshore and inland.

Through a non-invasive, visual inspection process an average of 350 tanks are inspected each year. This type of inspection involves removing the septic tank lid(s), examining the interior of the tank with a camera; checking the inflow and outflow baffles; condition of the tank and lid structure; taking a history of the



system and family water-use practices; and examining the leaching bed for signs of problems. The system is also spatially mapped using GPS equipment.

Pearson explains that after the inspection, the home owner is mailed an information package with educational materials, an aerial photo of the property showing the location of the septic system, a risk rating of the system; a tank pump-out log, and a copy of the original Certificate of Approval if on file. Homeowners are encouraged to leave the package for the new owners if they sell the property.

The re-inspection program is funded by a flat rate assigned to eligible properties on the annual taxes and is designed to complement the existing water quality sampling program carried out by the Township on area watercourses and Lake Huron.

At the 2011 State of the Lakes Ecosystem (SOLEC) Conference, held in Erie, Pennsylvania, Huron-Kinloss was recognized for exceptional performance and dedication to improving the Great Lakes by receiving a "Success Story" award for its reinspection program. The bi-annual conference provides Canadian and U.S. Great Lakes decision-makers and scientists with the opportunity to receive the most comprehensive, up-to-date information on the state of the Great Lakes. Since 1996, SOLEC has honoured various organizations who have exemplified a strong commitment to improving the environment within the Great Lakes basin. Pearson says Huron-Kinloss initiated the septic reinspection program to preserve the natural environment and improve water quality.

"Through education, the program encourages residents to act with the sustainability of the local ecosystem in mind, by performing regular septic system maintenance, conserving water, and minimizing the use of household chemicals," he says. "The program represents a long-term commitment on the behalf of the Township to engage and encourage residents to work towards sustainability with the environment."

For additional information go to http://www.huronkinloss.com/septic-systems.cfm◊