

# Rondeau Bay Community-Based Social Marketing Project



## CBSM Strategy Report

Prepared by Lura Consulting

for the Ontario Ministry of Natural Resources

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# 1 INTRODUCTION

## ***Backdrop for the Rondeau Bay CBSM Project***

Frequent algae blooms, excessive weed growth and muddy waters are among the current conditions reducing the water quality of Rondeau Bay. Contributing to these conditions are the excessive nutrients (particularly phosphorus) and sediments entering the Bay from surrounding lands and lakeside residents' activities as a result of poor land use or household practices. However, the extent to which residential phosphorus use throughout the watershed is affecting local water quality and shoreline health is not clearly documented.

In 2007, the governments of Canada and Ontario signed a new Canada-Ontario Agreement (COA) respecting the Great Lakes Basin Ecosystem to continue actions to restore and protect the Great Lakes environment. The Ontario Ministry of the Environment, in consultation with COA party-agencies (i.e., Ontario Ministry of Natural Resources, Ontario Ministry of Agriculture Food and Rural Affairs, and Environment Canada) is developing a Community-Based Social Marketing initiative for phosphorus reductions in the Great Lakes basins of Ontario. The Rondeau Bay project, led by the Ministry of Natural Resources, seeks to add to the understanding of the phosphorus issue with respect to shoreline residents in the Rondeau Bay area, and will address the COA commitment to increase Basin residents' awareness, protection and appreciation of the Great Lakes.

## ***About CBSM***

Community-Based Social Marketing (CBSM) has been employed internationally as a method of fostering sustainable behaviour. CBSM employs specific tools, developed through the science of Behavioural Psychology, to assist people to adopt behaviours that have a beneficial impact on the environment. While traditional communications strategies focus on communicating the benefits of adopting a behaviour through mass-media advertising, CBSM strategies focus on fostering the behaviour change through personal contact with people, and seek to remove the barriers which might reduce the likelihood of adoption of the preferred behaviour.

## ***A CBSM Strategy for Rondeau Bay***

This report presents a proposed Community-Based Social Marketing (CBSM) Strategy for Rondeau Bay. Results of a literature review and of a CBSM survey (report under separate cover) of shoreline residents conducted by Lura Consulting in August 2009 were used to develop this strategy. CBSM involves four steps:

- Identifying the barriers and benefits to an activity;

- Developing a strategy that utilizes CBSM tools that have been shown to be effective in changing behaviours;
- Piloting the strategy; and
- Evaluating the strategy once it has been implemented.

This report presents details for the first two steps listed above – barrier and benefit identification and CBSM strategy development. Specifically, the report examines the barriers to and benefits of the Rondeau Bay lakeside residents changing their behaviours to reduce phosphorus inputs to Lake Erie, as well as presents elements of a CBSM strategy to foster the desired behaviour change. The report also provides recommendations for piloting and evaluating the strategy. The Rondeau Bay CBSM project was developed by Lura Consulting under contract to the Ontario Ministry of Natural Resources.

### ***Project Methodology and Outcomes***

In order to develop an appropriate CBSM strategy to address phosphorus loading in Rondeau Bay from residential sources, a CBSM survey was conducted in August 2009 to achieve a better understanding of the current practices and activities of shoreline residents that contribute to phosphorus loading in the Bay. As well, a door-to-door survey examined how social norms, beliefs, attitudes, perceptions and external barriers influence residents' decisions to use phosphorus or engage in more ecologically friendly shoreline behaviours.

The readers of the recommended strategy for this project should recognize that the phosphorus loading issue varies from lake to lake and from location to location within each Great Lake basin and watersheds. Further targeted research will be required to determine specific local attitudes and behaviours and the associated barriers and benefits to changing those behaviours for the residents in those locations.

An outcome of the literature review and CBSM survey was a better understanding of the current behaviours, attitudes, awareness, and motivational tools/techniques that could be used to foster behaviour change in lakeside residential behaviours. The targeted behaviours are the foremost activities of the lakeside residents that are contributing to phosphorus loading in the Rondeau Bay and Lake Erie nearshore area. The knowledge obtained through the CBSM survey has been used to develop the CBSM strategy which is aimed at encouraging shoreline residents to change behaviours by making the connection between their activities and practices, and the potential for excessive phosphorus loading.

### ***Overview of this Report***

Following this Introduction, the report is organized as follows:

- Section 2 provides a brief overview of CBSM and the Rondeau Bay area, and pinpoints key target audiences (those who the CBSM strategy will specifically target) for this project;
- Sections 3 through 6 present highlights from the research on residential practices, knowledge, attitudes and key information sources – that provided a strong foundation for CBSM strategy development;
- Section 7 summarizes the barriers and benefits emerging from the research;
- Section 8 presents elements of the proposed CBSM strategy for addressing residential behaviours that contribute to phosphorous in Rondeau Bay; and
- Section 9 summarizes key research findings, strategic directions and next steps.

## 2 CBSM AND RONDEAU BAY

CBSM is an approach drawn from research in the social sciences that demonstrates behaviour change is most effectively achieved through initiatives delivered with direct face-to-face contact at the community level. CBSM initiatives focus on removing barriers to an activity and stressing the benefits to the desired behaviour change. As noted in Section 1, CBSM strategy development and implementation involves four key steps:

1. Identifying the benefits and barriers to an activity;
2. Developing a strategy that utilizes “tools” to address these barriers and that have been shown to be effective in changing behaviour;
3. Piloting the strategy; and
4. Evaluating the strategy once it has been implemented across a community.

### 2.1 Fundamentals of CBSM

1. **Barriers: Identifying barriers that prevent people from engaging in the desired behaviours is a critical first step to designing a successful CBSM strategy.**

Barriers prevent people from changing their behaviour and are activity specific. Barriers may be:

- Internal to an individual – e.g., lack of knowledge, non-supportive attitudes, absence of motivation; or
- External to the individual – e.g., changes that need to be made in order for the behaviour to be more convenient (e.g., providing accessible

expertise or education) or affordable (e.g., subsidizing septic maintenance activities).

It is impossible to design an effective CBSM program without first knowing what inhibits the public from engaging in the desired activity. To identify these barriers, CBSM practitioners use a range of research methods including: 1) reviewing relevant articles and reports to have a clear understanding of what behaviour(s) are to be examined, and to learn from the experience of others; 2) focus groups, to explore in-depth attitudes and behaviours of people regarding the behaviour(s) under consideration; and 3) surveys conducted with a random sample of respondents. The first and last of these approaches were used to develop the CBSM strategy for reducing phosphorus in Rondeau Bay from lakeside residents' activities. Since the survey was face-to-face, personal interview style, focus groups were not required to confirm the findings.

**2. Direct Face-to-Face Contact: Achieving behaviour change is most effective when CBSM initiatives are delivered with direct face-to-face contact at the community level.**

Social research has shown that people are more willing to engage in behaviours in response to direct appeals to change, and when there is evidence of social support for that change. People also often respond best to information received from people they interact with in their communities and whom they trust. In CBSM strategies this means that promoting desired behaviours, illustrating why they are important and removing barriers works best in face-to face encounters. This can include interactions with staff when purchasing a product at a store, sharing stories at community events, or interacting with advocates and instructors at workshops. The communications used in these direct contacts must be personalized to individual groups, as people are more likely to remember information that evokes images personal to them.

**3. Simple Behaviours First: Behaviour change is most effective when starting with the “low-hanging fruit” – behaviours that are easy to do and have the least number of perceived barriers.**

For very difficult activities, it is often hard for people to make the leap from what they are doing now to what is desired of them, because they often surround the second activity with a large number of perceived barriers or reasons why not to do it. However, by adopting simple behaviours first, those with the fewest barriers attached to them, more people are likely to become engaged in the behaviour. Once people have started engaging in one behaviour, they will start seeing themselves as someone who supports the overall campaign and will be more likely to carry out the other activities desired of them.

**4. Public Commitment: Obtaining an individual's public commitment to engage in a desired behaviour greatly increases the probability they will carry out that behaviour.**



Commitment is a very strong force in Community-Based Social Marketing. Essentially, most people want to be seen to be doing what they have said they will do. By securing a commitment from someone to adopt a behaviour, research has shown that they are not only more likely to follow through with it, but are also more likely to agree to more demanding commitments in the future. There is a hierarchy of success of expressed commitments: public commitments have proven to be much stronger than written commitments, which in turn are much stronger than verbal commitments.

**5. Prompts: Prompts remind people of a commitment they have made and/or to perform a particular action.**

Individuals can have the knowledge of why it is important to carry out a desired behaviour, and can have the best of intentions to carry out the behaviour, but as it is a part of human nature to get wrapped up in other activities, they may not carry through with the behaviour. CBSM research has shown that prompts – in the form of stickers, memo cards, or tags – provide a visual reminder to engage in a particular behaviour. Prompts for a reminder of events that do not occur on a regular basis such as septic maintenance pumping can be especially effective.

**6. Community Norms: People often mirror their attitudes and behaviour by observing those around them (family, co-workers, neighbours). By creating new societal norms that have full community support, desired behaviour changes can reach a wider audience.**

Societal norms are very strong, can vary from culture to culture, and people find them difficult to break. Established norms can be broken down and replaced with new ones however. For example, the norm of smoking in other people's homes, in public places, and even on public transportation has been replaced by a new norm of not doing such things. People now wear seat belts where they once did not. Many people bring their own mugs to meetings rather than use disposable coffee cups. There is less drinking and driving now than there was 20 years ago. Fewer people now wear scented products in work places. These are all examples of substantial changes in social norms over the last several years. Norm appeals, therefore, are a way of making group standards more apparent.

**7. Incentives / Disincentives: These can be useful for motivating people to action or for adding more barriers to an undesired action.**

Incentives and disincentives have been shown to have a substantial impact on a variety of sustainable activities including waste reduction, energy efficiency and transportation. They are particularly useful when motivation to engage in action is low or people are not doing the activity as effectively as they could. Incentives can be offered for doing the "right thing" such as providing tax breaks or contest prizes. Conversely, disincentives can be implemented, such as fines, for doing the "wrong thing." Incentives for doing the wrong thing can also be removed, such as limiting the number of parking spaces.

**8. Feedback: People are more likely to stick with a behaviour change if they see that they are making a difference.**

People are more likely to stick with a behaviour change for a longer period of time (and potentially motivate others to change) if they see that they are making a difference in their community, their health or the environment. Feedback can be in the form of advertising, promotional literature, special events, presentations, or other such activities.

## **2.2 Introduction to Rondeau Bay**

'Rond eau' translates from French as 'round water' and likely describes the egg-shaped harbour that is Rondeau Bay. Six distinct communities line the shores of Rondeau Bay and the nearby shoreline of Lake Erie. Rondeau Bay and its 12,343 hectare watershed are located in Ontario, midway along Lake Erie's north shore, approximately 65 km east of Point Pelee and 130 km west of Long Point. Rondeau Bay's marshes are a provincially significant coastal wetland and an Environmentally Sensitive Area. They play a vital role in sustaining life, supporting populations of common and rare birds, mammals, reptiles, amphibians and fish. The area is an important stop over point for migrating waterfowl. Black and Caspian Terns breed in colonies and feed in the Bay. The area, along a major fall hawk and eagle migration route, is home to the Bald Eagle, which remains endangered on the lower Great Lakes. The marshes provide spawning, nursery and feeding habitats for many types of fish. Woodlots and forests in the watershed are typical of the Carolinian Life Zone that is found only in southwestern Ontario. Adjacent Rondeau Provincial Park is a magnet to bird watchers and nature lovers. Camping, power boating, canoeing, sailing, water skiing and windsurfing add to its recreational value.

Water quality has become degraded in Rondeau Bay largely a result of an excess of nutrients from both agriculture and lakeside residents' activities and as a result of the introduction of invasive species in the Bay. An alien plant, Eurasian Water-milfoil, has invaded the Bay over the last 20 years. Chemical herbicides have been used in the past to ease the resulting navigational difficulties. In the 1970s the Bay's aquatic vegetation community was in trouble and as a result water quality rapidly plummeted and the Bay's once world renowned bass and pike sport fishery rapidly declined.

The soil type in the Rondeau Bay area is primarily sand based soil as a result of lake deposits over many years. Since the soil base in the area is primarily sand, there is a high amount of permeability and thus an elevated percentage of phosphorus transfer to Lake Erie from lakeside residents activities.

## **2.3 Rondeau Bay Communities and Target Audience**

Through discussions with the Ontario Ministry of Natural Resources, Lura Consulting identified the main target audience for the CBSM project to be shoreline residents, including cottagers and permanent property owners, within

the Rondeau Bay watershed. Farmers were excluded from the project target audience because they were being addressed through a separate project conducted by the Ontario Ministry of Agriculture, Food and Rural Affairs.

**FIGURE 1: LAKE ERIE, RONDEAU BAY COMMUNITIES**



**Rondeau Bay Residential Community Descriptions**

**Shewsbury**

The original settlement of Shewsbury was chosen as a suitable port by Governor Simcoe in 1793. During the 19th century, the area was, in part, a destination of the ‘Underground Railroad’ and a black settlement formed on the town site of Shewsbury. The Shewsbury area has a population of 314 in Harwich Township and is on the North shore of Rondeau Bay. An 1879 map shows Rondeau Harbour as the post office name and Shewsbury as the name of the community laid out in a town grid with canals running inland between the streets. Rondeau was renamed Shewsbury in 1948, likely after a borough in Shropshire, England. The community of Shewsbury has changed in recent years to become a permanent residential area with the provision of municipal water in 2005. There are still a few unoccupied homes that belong to family members of the original black community; however these are being transformed to permanent residences

over time. All homes in Shrewsbury are on municipal water with septic systems and most have lawns and gardens.

### **Rondeau Bay Estates**

Rondeau Bay Estates is a relatively new community of seasonal and permanent homes on Rondeau Bay and is comprised of homes that have road access to the front of the property and a canal with boat access at the rear of all the properties. Many of the canals in the Rondeau Bay Estates subdivision were completely covered by algae during the survey period, in August 2009. The majority of the homes have manicured lawns and gardens and a few have hard surface driveways. All are serviced by municipal water and all are on septic systems.

### **Rondeau Subdivision**

Rondeau subdivision was comprised of older cottages that have now largely been upgraded to permanent and seasonal homes. This subdivision is located just to the north of the Rondeau Provincial Park boundary and is serviced by municipal water. Lot sizes tend to be small, and native dune grasses and ground cover are the dominant vegetative cover of the shoreline properties. Septic systems appear to be of variable and sometimes uncertain vintages, but appear to be predominantly of the same age as the original cottages.

### **Erieau**

The Village of Erieau has a population of approximately 400 and has a long history as a Lake Erie fishing village, with commercial and recreational fishing continuing to this day. The Lake Erie side of Erieau is serviced by a main street with a boulevard running through the middle of the village, which sits on a broad sand spit. The vegetation on the Lake Erie side of the community is comprised mainly of native grass and shrub vegetation. On the Rondeau Bay side of Erieau, all homes back onto a permanent metal seawall that provides docking space for the residents. Most of the homes on the Rondeau Bay side of Erieau have manicured lawns running up to the edge of the seawall. Approximately 75 percent of the original cottages in Erieau have been upgraded to seasonal and permanent residences. The village is serviced by municipal water and all homes have septic systems of varying status.

### **Erie Shore Drive**

The majority of the homes on the Erie Shore Drive are relatively recent permanent residences that front onto Lake Erie. Most have typically urban style manicured lawns and gardens. Municipal water and septic systems are the water and wastewater systems for this grouping of homes in the Rondeau Bay area.

### 3 RESIDENTIAL PRACTICES THAT CONTRIBUTE PHOSPHORUS TO RONDEAU BAY

The Rondeau Bay residential practices and behaviours that have become the target for the CBSM strategy are behaviours that contribute the most residential phosphorus to the Bay and Lake Erie. The behaviour selection process was greatly informed by the literature review and residential survey. The three behaviours that became the focus for the CBSM strategy are:

- not maintaining septic systems;
- the regular use of dishwasher soap that contains phosphorus; and
- the use of lawn fertilizers with phosphorus that are applied at approximately twice the recommended rate.

The other phosphorus causing behaviours studied through the survey were found to be of less concern due to the significantly smaller contribution of phosphorus to the Lake or the low level of willingness to conduct that activity. Since replacement or upgrading of septic systems is a major cost to residents, it was felt that through regular septic pumping and maintenance, a failing septic system will be identified and rectified by the owner without a CBSM strategy. Less than a third of the residents stated a willingness to create a lakeside buffer strip, while 73 percent stated a willingness to use organic or non-phosphorus fertilizer. The high level of willingness to use a non-phosphorus fertilizer puts the creation of a buffer strip at a lower priority and a relatively mute point, since very little phosphorus will run off the lawn, if none is applied in the first place. Practices such as car or boat washing at the lakeside residence were surveyed during the CBSM survey and found to be of less concern for causing phosphorus inputs to the lake.

#### 3.1 Septic Systems

Many residences in the Rondeau Bay area are over 50 years old, with the exception of Rondeau Bay Estates, and reportedly have septic systems of the same vintage. Since municipal water was installed in the area in 1995, the use of water in most of the residences has increased dramatically and additional water using appliances such as dishwashers and clothes washing machines have been installed. A corresponding increase in water use and wastewater flowing through often vintage septic holding tanks or septic systems is undoubtedly adding additional phosphorus to Rondeau Bay and Lake Erie. Since the soil type that the septic systems are located in is typically sand, the flow of phosphorus from leaking or overflowing septic systems to the Lake is relatively quick.

##### 3.1.1 Type of System – Rondeau Bay Area

When asked what kind of septic systems are generally used in the Rondeau Bay, most respondents (76 percent) replied that the septic tank with a leaching bed system is the most common. Also common is the holding tank system. Less common

(6 percent) is the two tank system. 6 percent of respondents said they did not know what type of septic system they had on their property.

### 3.1.2 Frequency of Pumping – General

Residents were asked how often they would advise that a septic tank be pumped out. 12 percent would advise once a year, while 22 percent said that every 2-4 years would be advisable. 29 percent thought that every 5-6 years would be often enough. Every 7-9 years was suggested by 11 percent of respondents. The remaining 26 percent thought that every 10 years or more would be sufficient. Other anecdotal responses included: “advising never to pump a septic tank”, “when it is full,” “when there is a problem” and “if I have a backup in the house.”

### 3.1.3 Age of System – Rondeau Bay Area

Residents were asked their thoughts about the average age of septic tanks/systems in the area. The average age given was 37 years while 31 percent of respondents said they did not know the age of their septic system. The age of systems ranged from a new system of 1 year to 60 years old. The average age of the tanks/systems was 20 years. 24 percent of respondents said they did not know how old their tanks/systems were.

### 3.1.4 Length of Time since Last Maintenance/Pumping – Property-Specific

To get an idea of septic maintenance habits among respondents, the surveyors asked how long it had been since the tank/system had been pumped out or maintained. Many (44 percent) respondents noted that it had been 1 to 5 years since their last pump out/maintenance. 32 percent said it had been 6 or more years since their system had been pumped and 20 percent said that they did not know when it was last pumped. 4 percent of the residents responded that their septic tank had never been pumped or maintained.

## 3.2 Dishwasher and Household Detergents

Rondeau Bay residents were asked what types of water-using appliances they operate on their properties. The most frequently mentioned appliance was a washing machine (74 percent), followed by a dishwasher (59 percent). 47 percent said they have more than one toilet.

Among those who use a dishwasher, (21 percent) mentioned using the Electrasol brand of dishwasher soap. Other popular brands were Cascade (21 percent), President’s Choice (16 percent) and No-name (11 percent). 9 percent use non-phosphorus brands such as PC Zero Phosphates. Tablet type dishwasher soaps are most common, with 40 percent of respondents using this type of detergent, followed by gel type (37percent) and powder types (20 percent) which are the least common. The number of times respondents run the dishwasher in an average week is 4.9 times. This would mean that an average lakeside residence in the Rondeau Bay area would be contributing approximately 500 to 700 grams of

phosphorus to the Lake yearly by using dishwasher soap with phosphorus, if their septic system was not functioning properly.

The amount of phosphorus in any given brand of dishwasher soap ranges from 4 to 9 percent by weight. The limit of 0.05 percent phosphorus in non-phosphate dishwashing detergents has been legislated in some 15 states and provinces across North America. Until Ontario passes similar legislation, the need for a CBSM strategy to change the behaviour of using phosphate dishwashing soaps is evident.

**Table 1: Phosphorus Content of Major Dishwashing Detergents**

<b>Phosphorus Content of Major Dishwashing Detergents</b>	
Palmolive Tablets	8.7 percent
Electra-Sol Tablets	8.7 percent
Sunlight Tablets	8.7 percent
Cascade Complete Tablets	8.7 percent
Spot-Free Powder (Wal-Mart)	7.0 percent
Electra-Sol Powder	6.1 percent
All	5.1 percent
Electra-Sol Gel	4.9 percent
Sunlight Powder	4.5 percent
Cascade PureRinse	4.4 percent
Cascade Complete (liquid)	4.0 percent

### 3.3 Use of Fertilizer Containing Phosphorous

Using phosphorus fertilizer has been identified as an activity that contributes to phosphorus loading in the Great Lakes especially for lakeside residents. 32 percent of respondents said that they do apply fertilizer. Among those, 41 percent said that their fertilizer did contain phosphorus. 59 percent said they did not know if the fertilizer they used on their lawn contained phosphorus. Those who apply fertilizer said that they apply it an average of 1.7 times per year. The average amount of fertilizer applied is about 12.8 kg for over an average of 814 square meters of lawn. This is approximately double the recommend rate of application for the types of lawn fertilizers being applied.

Approximately twice as much fertilizer (and as such – phosphorus) is being applied to lakeside residential lawns in the Rondeau Bay area than is recommended by the manufacturers.

Of the Rondeau Bay residents surveyed, only 33 percent stated they would be willing to install a buffer strip of native plants between the lawn and lake. A relatively small number (23 percent) of the residents said they would be very likely to sweep fertilizer from paved surfaces. Roughly half the properties had hard surface driveways and walkways, which if not swept of fertilizer after an application, will lead to run off of phosphorus directly to the Bay or Lake.

## **4 RESIDENTS' KNOWLEDGE OF THE PHOSPHORUS ISSUE AS IT RELATES TO WATER QUALITY**

The relative level of knowledge and attitudes of the Rondeau Bay area residents towards lake water quality and activities that affect lake water quality are important considerations in developing a CBSM strategy. The knowledge and attitudes of the residents will inform the strategy which aims to change behaviours that are causing excess phosphorus. For example, more than half of the Rondeau residents thought the water quality of the Bay and Lake was good to excellent. Many thought excess weed growth was an indicator of good water quality and did not associate their residential phosphorus inputs to the excess algae and weed growth in the Lake or on the beach adjacent to their properties.

### **4.1 Quality of Water in Rondeau Bay**

Rondeau Bay residents were asked what they thought of the water quality in Rondeau Bay this year. On a scale of 1 to 10, where 1 is very poor and 10 is excellent, the average response was a 7. 51 percent thought that the water quality was good to excellent (responding with 7 to 10 on the scale). Only 5 percent thought that the water quality of the bay was poor (response of 1 to 3 on the scale) and 44 percent were neutral about the water quality (responses of 4 – 6 on the scale from 1 to 10).

### **4.2 Meaning of Poor Water Quality**

To get an idea of what Rondeau Bay residents feel defines 'poor lake water quality,' the surveyors asked respondents to give examples of what defines poor water quality for them. Some of the responses given include algae (23 percent), weeds (40 percent), smell of water (15 percent), lack of water clarity (28 percent), animal/bird excrement (7 percent), invasive species (such as zebra mussels) (4 percent), debris in water (38 percent), and chemicals/toxins in water (23 percent). Other frequently mentioned definers of poor lake water quality were dead fish (20 percent), cannot swim in the lake (9 percent), bacteria (4 percent), or farm runoff/chemicals (8 percent).

### **4.3 Water Quality Trends in Rondeau Bay**

The survey also sought respondents' opinions about trends in water quality in Rondeau Bay over the past 5 to 10 years. Most (22 percent) respondents felt that the water quality in the Bay has been greatly improving over the last 5 to 10



years. 20 percent believe the water quality to be marginally improving. 15 percent think that it is marginally worse, while 12 percent thought the water quality was much worse. 19 percent said they did not know the water quality trend.

#### **4.4 Importance of Water Quality in Rondeau Bay**

Surveyors asked respondents to rate the importance of water quality in the Bay. On a scale of 1 to 10, where 1 is not at all important and 10 is very important, the responses ranged from 4 to a 10. Most (90 percent) felt the water quality was important to very important (response of 7-10 on the scale). None responded that the water quality was not at all important to not important (response of 1 – 3 on the scale of 1 to 10).

For those who answered between a 6 and a 10 (93 percent), the surveyors asked why the water quality of the Bay was important to the respondents. The most popular response was swimming (50 percent). 34 percent of respondents said that water quality was important for their family's health. Another 33 percent consider water quality important for aesthetic reasons. "Environmental" and "affects property values" were also reasons for considering water quality important, with 20 percent and 18 percent of respondents, respectively, providing these as reasons.

For those who answered between a 1 and a 5, the surveyors asked why the water quality of the bay was not important to the respondents. The most popular response was because they did not think it affects them.

## **5 RESIDENTS' ATTITUDES TOWARDS BEST PRACTICES TO REDUCE PHOSPHORUS INPUTS**

### **5.1 Behaviours/Activities**

Determining behavioural barriers and the associated activities of the Rondeau Bay residents is an integral part of the CBSM strategy development. Behaviours may be internal to an individual, such as lack of knowledge of the cause and associated effects of excess phosphorus to lake health. Behaviours can also be external to the individual, such as changes that need to be made in order for the behaviour to be more convenient (e.g., provide a prompt or reminder for using non-phosphorus dishwasher detergents) or affordable (e.g., providing incentives to maintain a septic system).

### **5.2 Benefits & Barriers**

The Rondeau Bay CBSM survey asked a series of questions to help identify leading barriers to and benefits of adopting behaviours that would assist in reducing phosphorus loading to Rondeau Bay. CBSM programs aim to remove barriers that stand in the way of people implementing a selected behaviour and/or induce a benefit to make the target behaviour more attractive. This can

be accomplished by decreasing the barriers to the target behaviour, decreasing the benefits of the competing behaviour(s) or by increasing the barriers of the competing behaviour(s).

### **5.2.1 Willingness to Use Non-Phosphorus Lawn Fertilizer**

Rondeau Bay lakeside residents were asked to rate, on a scale of 1 to 5 (where 1 is not at all likely and 5 is very likely) and under six different circumstances, the willingness to use non-phosphorus fertilizer. 73 percent of respondents said people would be very likely to use non-phosphorus fertilizer if they understood the impact on water quality and algae growth. Respondents thought that people would be most likely to use non-phosphorus fertilizer if they were reminded not to use phosphorus fertilizer (64 percent), whereas 45 percent said they would be very likely if there was a trade in program for their old phosphorus fertilizer. A significant percentage (26 percent) did not know what activity they would be willing to take part in to reduce phosphorus loading in Rondeau Bay.

### **5.2.2 Willingness to Engage in Landscaping Activities to Reduce Phosphorus**

Residents were asked to rate their willingness, on a scale of 1 to 5 (where 1 is not at all likely and 5 is very likely), to engage in eight activities that would reduce the impact of phosphorus fertilizers. Respondents showed the highest degree of willingness to plant a hardier species of grass, with 41 percent of respondents indicating that they would be “very likely” to engage in that activity. 37 percent indicated that they would be willing to not use fertilizer, whereas 37 percent said they would be very likely to mow their lawn to a 3 inch height. Only 33 percent stated they would be willing to install a buffer strip of native plants between the lawn and Lake. The smallest percentage (23 percent) of respondents said they would be very likely to sweep fertilizer from paved surfaces.

### **5.2.3 Likelihood of Regular Septic System Maintenance through Pumping**

Rondeau lakeside residents were asked to rate the likelihood, on a scale of 1 to 5 (where 1 is not at all likely and 5 is very likely) that people in the Rondeau Bay area would regularly (i.e., every 3 years) pump their septic tank/systems under six different circumstances. Respondents most often (65 percent) said that they would be very likely to regularly maintain their septic system if they understood the impact on water quality and algae growth. A similar number (65 percent) stated they would be willing if there was a financial incentive of a 50 percent rebate of the average cost of a pumping service. 51 percent said they were willing to regularly pump their septic tank if it was a municipal service, whereas, 44 percent said they would conduct regular septic tank pumping if they were reminded to do it. Neighbours seemingly had little influence on this behaviour, with only 31 percent responding that they would be likely to conduct this service if many of the neighbours were pumping their septic system.

#### 5.2.4 Likelihood of Septic System Upgrades

Respondents were asked to rate the likelihood, on a scale of 1 to 5 (where 1 is not at all likely and 5 is very likely) that people in the Rondeau Bay area would upgrade their septic systems under six different circumstances. Respondents most often (65 percent) said that residents would be very likely to upgrade their septic systems if there was a financial incentive. Equally important in responses from the residents (55 percent) was that people would be very likely to upgrade if they understood the impacts on water quality and algae and if it cost less than replacement of their septic system. They also were most likely to upgrade if there was assistance provided to upgrade their septic system (49 percent). The type of assistance was not specified, but many would assume at least partial financial assistance based on earlier questions. Only 30 percent said they would be very likely to upgrade if many of their neighbours upgraded their septic systems.

#### 5.2.5 Willingness to Use Non-Phosphorus Dishwasher Soap

Respondents were asked to rate their likelihood, on a scale of 1 to 5 (where 1 is not at all likely and 5 is very likely) of switching to a non-phosphorus dishwasher soap under five different circumstances. Respondents most often said that they would be very likely to switch if they understood the impact on water quality and algae growth (77 percent). 72 percent of respondents said they would be very likely to switch if the detergent worked as good as regular dishwasher soap, whereas 58 percent said they would be very likely to switch if they were reminded not to use phosphorus dishwasher soap. The respondents stated that the least influence on their behaviour (26 percent) was if all the neighbours stopped using phosphorus soaps.

## 6 INFORMATION SOURCES

### 6.1 Current Sources of Information about Rondeau Bay/Lake Erie

Respondents receive their current information about water quality in Rondeau Bay and Lake Erie from a variety of sources. By far the largest percentage (45 percent) stated that they had received no information about water quality in the Rondeau Bay and Lake Erie. The most popular source of information (18 percent) identified was neighbours, followed by newspapers, both local and regional (15 percent). The list of current sources and percent response from the residents is presented in Table 2, below:

**Table 2: Residents' current sources of information about water quality in Rondeau Bay and Lake Erie**

<b>Current Sources of Information</b>	<b>Percent</b>
<b>No information received</b>	45
<b>Neighbours</b>	18
<b>Newspaper</b>	15
<b>Beach Closure Information Notices – Health Unit</b>	11
<b>Municipality</b>	10
<b>Internet</b>	8
<b>Cottage Association</b>	6
<b>Provincial Government/MNR/Rondeau Provincial Park</b>	6
<b>Self Observation</b>	5
<b>Conservation Authority</b>	4
<b>NGOs – Ducks Unlimited, Stewardship Council, Anglers Association</b>	4
<b>Federal Government</b>	1

## 6.2 Trusted Sources of Information

As a source of information about water quality in the Bay and Lake Erie, most respondents (38 percent) indicated that a variety of branches of the provincial government is their most trusted source, followed by non-government organizations (29 percent) such as the Friends of Rondeau, Angler Associations, Stewardship Councils, Cottage Associations and the Rondeau Watershed Coalition. The list of trusted sources of information about improving water quality in Rondeau Bay and Lake Erie is listed in Table 3, below:

**Table 3: Residents' trusted sources of information on water quality in Rondeau Bay and Lake Erie**

<b>Trusted Sources of Information</b>	<b>Percent</b>
<b>Provincial Government: MNR/MOE/Rondeau Park</b>	44
<b>Non-government organizations (Ducks Unlimited Canada, Stewardship Council, Anglers Association, Rondeau Watershed Coalition)</b>	29
<b>Conservation Authority</b>	22
<b>Municipality</b>	18
<b>Internet</b>	8
<b>Beach Closure Information Notices (Health Unit)</b>	11
<b>Cottage Association</b>	6
<b>Self Observation</b>	5
<b>Federal Government</b>	1

### 6.3 Best Communication Methods

Respondents generally thought that mail/flyer/brochures (48 percent) and meetings (11 percent) either through resident association or via a town-hall type meeting were the best ways to reach Rondeau Bay residents with messages about water quality in the Bay and Lake Erie. Fewer respondents (9 percent and 8 percent, respectively) said that the Chatham newspaper and personal visits were the best ways to communicate. Only 7 percent said that the internet or email was the best way to communicate with them.

### 6.4 Implications for Future Communications

Conduits for supplying information on the topic of phosphorus to the majority of residents of the Rondeau Bay are generally poor. Without a comprehensive source of information that is used by the majority of residents, it is recommended that two approaches be tested in a pilot study with a control to evaluate effectiveness. Either door-to-door visits with students distributing educational materials (such as brochures, website content and a handbook) about phosphorus reduction in the three areas identified or 'town hall' type meetings to communicate the phosphorus message and hand out educational materials should

be tested in two of the communities, while only a control evaluation survey is conducted in a third community.

Potential points of contact with lakeside residents in Rondeau Bay include:

- Rondeau Park Workshops/Events
- Resident Association Meetings
- Municipal tax notice or newsletter
- Municipal, ratepayers' and cottage association meetings
- Church socials
- Fishing Tournaments
- Local Health Units
- Local Stewardship Council Network
- FOCA newsletter and website
- Stories in the local newspaper about water quality
- Engage the local Rondeau Bay Watershed Coalition
- Dove-tail with Federal/Provincial /State Lake Erie Nutrient Management Strategy – developed in response to Lake Erie LaMP
- Incentive programs through the local municipality
- CBSM-style prompts provided by the municipality or septic pumping companies.

## 7 BARRIERS AND BENEFITS MATRIX

### *Barriers and Benefits Matrix - An Explanation*

The barriers and benefits matrix, Table 4, included below, has a listing of current behaviours linked to phosphorus (P) loading in Rondeau Bay from lakeside residences. The barriers and benefits included in the table are derived from a number of sources including the literature review and survey. The values in the far-right columns that suggest magnitude of impact and probability of behaviour change are derived from a subjective evaluation that is provided in the accompanying document in Appendix B, entitled “Behaviours Evaluation of & Impact and Probability Matrix.”

Table 4 provides a basis for identifying which behaviours should be targeted to create the greatest beneficial impact toward reducing residential use of phosphorous and thus input of phosphorus to Lake Erie. The top three behaviours selected for this CBSM strategy are: L1: use of non-phosphorus or organic lawn fertilizers; D1: Switch to non-phosphorus dishwasher detergent; and S2: Maintain septic system by regular pumping.

**Table 4: Evaluation of Impact and Probability – Per Behaviour (Based on Survey Results)**

<b>Behaviour</b>		<b>IMPACT</b>				<b>PROBABILITY</b>					<b>Total Score (sum/average)</b>
		Which behaviour will result in the highest reduction of P?	Which behaviour will have additional water quality benefits?	Which behaviour is the most sustainable?	Avg	Which behaviour will be the most affordable/applicable to promote to my audience?	Which behaviour will be the most affordable for my audience to adopt?	For which behaviour will it be easiest to show a link to the problem?	Which behaviour has the fewest barriers to overcome?	Avg	
<b>ID Code</b>	<b>Lakeside Residential</b>										
L1	Use no P lawn fertilizer or organic products	4	4	4	4	4	4	4	3	3.75	3.86
L2	Apply P fertilizer at appropriate rate based on soil testing	2	3	2	2.33	2	2	2	2	2	2.14
L3	Leave yard clippings on the lawn	2	3	4	3	2	4	2	3	2.75	2.86
L4	Establish appropriate lakefront/tributary buffer zones using native vegetation	3	3	3	3	2	2	3	2	2.75	2.57

Behaviour		IMPACT				PROBABILITY					Total Score (sum/ average)
		Which behaviour will result in the highest reduction of P?	Which behaviour will have additional water quality benefits?	Which behaviour is the most sustainable?	Avg	Which behaviour will be the most affordable/applicable to promote to my audience?	Which behaviour will be the most affordable for my audience to adopt?	For which behaviour will it be easiest to show a link to the problem?	Which behaviour has the fewest barriers to overcome?	Avg	
D1	Switch to non-P detergents	4	3	4	3.67	4	4	4	3	3.75	3.71
D2	Wash cars at commercial car wash facilities	2	3	2	2.33	2	2	2	2	2	2.14
S1	Fix leaking septic systems	4	4	3	3.67	3	1	3	2	2.25	2.86
S2	Maintain septic system: pump every 3-5 years	3	4	4	3.67	4	4	4	4	4	3.86

Note: For each behaviour grouping above, the behaviours that scored highest are highlighted in yellow.

The top three behaviours for reducing phosphorus to Lake Erie from Rondeau Bay residences are:

1. **L1** - Use no P lawn fertilizer/or organic products – **(Total score = 3.86)**
2. **S2** – Maintain septic systems - **(Total score = 3.86)**
3. **D1** - Switch to non-P detergents – **(Total score = 3.71)**



## 7.1 Recommended Target Behaviours for CBSM Strategy

From the analysis and the Barrier and Benefits matrix above, the top three behaviours in the Rondeau Bay that are recommended to be the target of this CBSM strategy are:

1. Use of non-phosphorus or organic lawn fertilizers.
2. Switch to non-phosphorus dishwasher detergents.
3. Maintain septic system by regular pumping.

These three behaviours are recommended for the CBSM strategy, based on the frequency with which residents engage in the behaviour, and the amount of phosphorus reduction achievable in light of willingness to changing these behaviours – as identified through the CBSM survey.

## 8 RONDEAU BAY CBSM STRATEGY

### 8.1 Desired Outcomes

The CBSM Strategy will foster behaviours to reduce the amount of phosphorus entering Rondeau Bay and Lake Erie. Desired outcomes include:

1. Enhanced water quality through direct behaviour changes in one, two or all of the three targeted behaviours.
2. Increased awareness of the cause and effect of excess phosphorus inputs.
3. Encouragement of further action by people already engaged in green activities, to improve the water quality of the Great Lakes.
4. The establishment of a social ethic by lakeside residents of becoming lake water quality stewards.

### 8.2 Barriers and Removing Them

CBSM campaigns strive to reduce barriers to adoption of behaviours to make the adoption more likely. Behaviours are more likely to change if the new behaviour is convenient and simple to undertake.

#### 8.2.1 Overarching Barriers to Phosphorous Reduction

There are three significant barriers to adoption of any phosphorous reduction behaviours in Rondeau Bay. Currently there is a lack of awareness and understanding of the state of the water quality in the Bay, with many residents believing that the water quality is good, and that the presence of weeds and algae are a good indicator of water quality. As well, there is little awareness that residents are contributing to a problem with water quality. Finally, there does not seem to be an understanding of the connection between residents'

behaviours in their homes and on their properties and the effect it can have on the Bay.

### 8.2.2 Removing the Overarching Barriers

It is necessary to develop an information campaign to make residents aware that:

1. We all benefit from clean water;
2. Clean water is important to our well-being and the health of the Great Lakes Basin ecosystem and its economy;
3. Each of us has a role to play in keeping our local waters clean and healthy; and,
4. Each of us can do small things to help clean up our local waters, such as using organic or phosphorus free fertilizers and dishwashing detergents.

The information campaign must closely link the behaviours to the effect. The communications materials should be vivid and explicit. For example, images of fish and aquatic weeds could be manipulated into images of a toilet bowl. Dead fish could be shown inside a dishwasher. An image of someone dumping a bag of fertilizer into a water body covered in algae could be used, with a caption like “phosphorous makes everything grow.”

A similar campaign can be used to show the benefits of positive behaviour, such as a nice clean body of water beside a lawn being fertilized, with a bag showing 10-0-10 or something else that indicates no phosphorous is being used. A faux dishwasher product box could say “Phosphate-free. Cleans dishes. Saves fish.”

The campaign should engage the local cottagers association with experts who have knowledge about the history of water quality in the Rondeau Bay area as well as some expertise on how to improve water quality through good home and land use practices. The cottagers association should be asked to set up a meeting where a local MNR expert could come in and explain the process of eutrophication, and demonstrate with photos, what could happen to Rondeau Bay if residents continue to load phosphorous into the Bay through their behaviours.

In addition, an information package should be developed and distributed door-to-door by people trained in CBSM techniques. The information package would allow for people to receive the information that is required to connect their behaviours to water quality reduction. At the same time, it will allow for an opportunity to apply other CBSM techniques, which are discussed below.

### 8.2.3 Removing Barriers to Using Non-Phosphorous Fertilizers

The research indicated that there is little to prevent people from using non-phosphorous fertilizers, other than forgetfulness and a desire to use up what fertilizer they may already have.

Lawn fertilization is a seasonal activity, starting in early spring and ending in the fall. Reminders will be needed in all seasons in order to ensure that people avoid using phosphorous. Engaging local garden centres, hardware stores and others in reducing phosphorous sales could be effective, but it must be kept in mind that the

retailers want to sell fertilizer, including all of the phosphorous stock they have. Many might be more likely to adapt to the shift in behaviour and demand rather than be an agent of change. However, it is worth talking to retailers to see if they would be willing to promote the use of non-phosphorous fertilizer and remind people to use it. At the very least it is important to inform them that a campaign will be launched to encourage the use of non-phosphorous fertilizers. If non-phosphorous fertilizer is unavailable to residents at the stores they frequent, they will not be able to switch to it.

As part of the door-to-door campaign to encourage people to switch behaviours, residents should be offered an opportunity to switch a bag of phosphorous-based fertilizer for a non-phosphorous bag. The swap immediately removes a barrier to switching behaviour, and it also underlines how important it is to change fertilizing methods.

#### 8.2.4 Removing Barriers to Using Non-Phosphorous Dishwasher Detergent

There is little to prevent people from using non-phosphorous dishwasher detergent. Residents indicated that, if they are assured the detergent will work as well, only a reminder is needed to change their behaviour.

The communications materials should indicate that there are non-phosphate alternatives to traditional dishwasher detergents, and list them. It is also important, as part of the CBSM strategy, to ensure that they are available for purchase in the community. The communications materials delivered door-to-door should include a list of local retailers that carry the preferred detergents.



In order to remind people to use phosphate-free detergents, a magnet reminding them could be handed out and residents could be encouraged to place them on their dishwashers. Because it is more likely that the magnets will be used if they serve another useful purpose, it could be designed to tell people if the contents of the dishwasher are clean or not (see mock-up).

#### 8.2.5 Removing Barriers to Pumping Septic Systems

Surveyed residents indicated that they would be most willing to pump their septic systems every three years if they knew the benefits and if there was a financial incentive to do so.

The communications materials should be clear about the benefits of regular pumping of septic systems. The benefits to protection of the Bay should be prominent, but also the benefits to the septic system owner should be clear, such as avoidance of a costly replacement if a tile bed becomes clogged. A pilot testing of these messages would determine which is most important to people, or if both messages are needed in order to cover the widest array of residents.

Reminders are important in septic system maintenance. Many pumping companies routinely contact customers after 3 years to remind them that it is time to pump the system out again; it is good business practice to do so. However, in order to get the person on a call-back list there is a need to get them to pump their system. As 2 in 3 respondents believe that the required frequency is longer than it should be (every 3 years for the average household) then the CBSM program should include a strategy to obtain a commitment to have septic systems pumped right away.

### **8.3 Commitment Strategies**

The people who conduct the door-to-door visits should be trained in CBSM techniques of obtaining commitments from residents to participate in the behaviours. At the end of a discussion, for instance, it would be easy for the visitor to ask the resident “Can we count on you using phosphate-free dishwasher detergent?” When a person answers yes, then the visitor should mark it down on a commitment recording sheet, which will make the commitment more real for the resident. Of course, commitment should be sought on all 3 behaviours.

### **8.4 Building a Social Norm**

A key goal of a CBSM strategy is the development of a social norm. In this case, it should be made clear that using phosphorous fertilizers and phosphate dishwashing detergents is socially unacceptable in the Rondeau Bay community because of the effect that the behaviour has on the common resource, the water quality in the Bay. An effective campaign should have people embarrassed to be seen carrying phosphorous fertilizers out of stores and have those that buy phosphate-based detergents resort to trying to hide them on the bottom of their shopping carts. People should feel compelled to have their septic systems pumped when the company calls to remind them, or else people in the community may become aware that they are not holding up their part of the bargain.

By pressing the idea that these behaviours are for the good of the community and all of its members, a feeling of the common good can be established.

To this end, if a door-to-door campaign is employed, consideration should be given to hiring students from the local community to make the program more peer-based. It is hard to tell a young student that you will not adopt responsible behaviour that will protect the Bay for their future use.

### **8.5 CBSM Pilot Project**

Because of the relatively small size of the overall community, any pilot project will address a large portion of the community.

It is not necessary to test different approaches to delivering the messaging that the situation requires or to test different campaign methods. It is clear that there is a need for a strong information campaign and a need to have one-on-one dialogue with people to secure commitment and build a social norm.

It is recommended that a pilot be held in the Town of Shrewsbury, and should include the two elements of an open house and door-to-door visits by representatives trained in CBSM techniques. The pilot will be used to evaluate the

strength of the communications messaging and the effectiveness of the techniques used to secure commitment. It will also test some structural issues, such as the availability of alternative products and the willingness of retailers and septic service companies to participate in the program.

### 8.6 Potential CBSM Pilot Conditions

Table 5 below shows the potential conditions for the CBSM pilot described above.

**Table 5: Potential Pilot Conditions and Replication for a Rondeau CBSM Pilot**

<b>Condition #1</b> <b>No Pilot Staff</b>	<b>Condition #2</b> <b>With Pilot Staff</b>	<b>Control</b>
<ul style="list-style-type: none"> <li>• Partner with retail outlets to have P dishwasher soap and fertilizer trade in program for non-P material</li> <li>• Signs in place to encourage phosphorus reduction at home</li> <li>• # of Locations – grocery/hardware store most frequented by Rondeau Bay residents</li> </ul>	<ul style="list-style-type: none"> <li>• Pilot staff available to provide information and education materials and seek commitments</li> <li>• # of Locations – random selection of homes in Shrewsbury</li> </ul>	<ul style="list-style-type: none"> <li>• No interventions – serves as a basis for comparison versus Condition #1 and #2</li> <li>• # of Locations – random selection of homes in Rondeau Subdivision</li> </ul>

## 9 SUMMARY

The Rondeau Bay CBSM research and survey has revealed that the residents of Rondeau Bay and area do not have the information required to make informed decisions about their activities and the resulting input of nutrients such as phosphorus to Rondeau Bay and Lake Erie. They do care a great deal about the water quality of the Bay and Lake, which will be a great motivator to changing behaviour to reduce phosphorus inputs. There has been a monumental shift over the past 15 years from predominately seasonal cottage usage with individual wells or sand point water systems to today’s permanent homes with municipal water supply, yet no municipal sewer to date. The percentage of permanent

residents (55 percent) surveyed to seasonal residents (45 percent) was indicative of the shifting demographics of residential use of the area. Many of the original septic systems in the area were built for seasonal use only. As a result, these systems are now likely being pushed beyond their original intended capacities with additional waste water flowing through largely older vintage (average age 37 years) septic systems on sand based soils. As well, the growing prevalence of additional water using appliances such as washing machines (74 percent) and dishwashers (59 percent) is also quite likely adding to the additional volume of wastewater entering residents' septic systems.

The excess water plant growth and build up of algae are not seen by many of the residents to be issues that are caused by residential phosphorus inputs; rather some argue that the agricultural sector in the area is the cause of these issues. Many think that a fish-kill in the Bay and on Lake Erie is the best indicator of poor water quality. Not one respondent stated that excess residential nutrient input was a causal agent for increased algae growth in the area.

Only 20 percent of residents felt the water quality was greatly improving over the last 5 to 10 years, yet 90 percent felt water quality was important to very important to them. 59 percent of those surveyed were not able to correctly make the connection between phosphorus inputs and increased algae blooms. None stated nutrient or phosphorus input had a negative impact on water quality.

Three identifiable, behaviours have been identified through this research as the target for a Rondeau Bay CBSM strategy;

1. Use of non-phosphorus or organic lawn fertilizers.
2. Switch to non-phosphorus dishwasher detergents.
3. Maintain septic system by regular pumping.

Targeting these behaviours by conducting a pilot using a variety of CBSM tools – as outlined in Section 8 of this report – is the next step for this project, contingent on funding and partners.

Rondeau shoreline residents are well educated; however, they have not had the benefit of learning about the detrimental effects their everyday and seasonal activities at the cottage or at the shoreline can have on the lake water quality they cherish as lakeside residents. A CBSM program will lead to a positive outcome for the Lake and the Rondeau Bay residents who enjoy it.

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## Appendix A

# COMMUNITY BASED SOCIAL MARKETING (CBSM) - A PRIMER

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## COMMUNITY BASED SOCIAL MARKETING (CBSM) – A PRIMER

**CBSM involves 4 steps:**

### 1) Identifying the barriers and benefits to an activity

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Barriers may be:

- internal to an individual – e.g., lack of knowledge, non-supportive attitudes, absence of motivation
- outside the individual – e.g., changes that need to be made in order for the behaviour to be more convenient (e.g., providing curbside organic collection) or affordable (e.g., subsidizing public transit or compost units).

Uncovering barriers and benefits involve a combination of 2 or 3 of the following steps:

- a. **Literature Review** - Reviewing relevant articles and reports
- b. **Focus Groups** - Obtain qualitative information through focus groups and observation to explore in-depth attitudes and behaviour of residents regarding the activity.
- c. **Survey** - Conduct a survey with a random sample of residents.

### 2) Developing a strategy that utilizes “tools” that have been shown to be effective in changing behaviour

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#### Commitment

- Emphasize written over verbal commitments
- Ask for public commitments
- seek commitments from groups of people that are highly cohesive
- Actively involve the person
- Use existing points of contact to obtain commitments
- Don't use coercion

#### Prompts

- Visual or auditory aids which remind us to carry out an activity that we might otherwise forget
- Make the prompt noticeable
- Make sure that your prompt is vivid (a bright color) and eye-catching
- Make the prompt self-explanatory
- Present the prompt in as close proximity as is possible to where the action is to be taken
- Use prompts to encourage people to engage in positive behaviours



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## **Norms**

- Norms guide how we should behave. If we observe others acting unsustainably, such as using water inefficiently, we are more likely to act similarly. In contrast, if we observe members of our community acting sustainably we are more likely to do the same.
- Make the Norm Visible
- Find ways to publicize involvement in sustainable activities, such as providing ongoing community feedback on the amount of water that has been saved by homes using water efficiently
- Use Personal Contact to Reinforce Norms

## **Communication**

- All programs to foster sustainable behaviour include a communication component.
- Use Captivating Information
- Know your Audience
- Use a Credible Source
- Frame your Message
- Carefully Consider Threatening Messages
- Decide on a One-Sided versus Two-Sided Message
- Make Your Message Easy to Remember
- Provide Personal or Community Goals
- Emphasize Personal Contact
- Provide Feedback

## **Incentives**

- Closely Pair the Incentive and the Behaviour
- Use Incentives to Reward Positive Behaviour
- Make the Incentive Visible
- Be Cautious about Removing Incentives
- Prepare for People's Attempts to Avoid the Incentive
- Carefully Consider the Size of the Incentive
- Use Non-Monetary Incentives

### **3) Piloting the strategy**

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- Once you are confident that you have a program that should affect behaviour, pilot the program.
- In conducting the pilot, ensure that you have at least two groups; one that receives the intervention and another that serves as a comparison or control group.
- Randomly assign households or individuals into either group to ensure that the only difference between the groups is whether or not they received the intervention.

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**4) Evaluating the strategy once it has been implemented across a community.**

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- In evaluating the effectiveness of your pilot, focus on behaviour change rather than measures of awareness or attitude change. If your pilot is not successful in altering behaviour, revise your strategy and pilot it again.














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## Appendix B

# Behaviour Evaluation of Impact and Probability

Current Activity	Desired Behaviour Change	Source/issue	Potential Impact of Adopting Behaviour Change	Barriers	Benefits	Rondeau Bay Survey Results	Type of Change	Probability of Behavior Change * (0 - 4)
<b>Rondeau Bay – Lakeside Residential Audiences</b>								
Excessive Use of P lawn fertilizers	Use of low or no P lawn fertilizer	Halton's Lake Ontario Shoreline Algae Action Advisory Committee (LOSAAAC) identifies overuse of P fertilizer as causing algal blooms	<ul style="list-style-type: none"> <li>"Runoff from lawn sites with nonphosphorus fertilizer applications had a median total P concentration that was similar to that of unfertilized sites, an indication that nonphosphorus fertilizer use may be an effective, low-cost practice for reducing phosphorus in runoff." &lt;Source: <i>Effects of Lawn Fertilizer on Nutrient Concentrations in Runoff from Lakeshore Lawns, Lauderdale Lakes, Wisconsin</i>, USGS Water-Resources Investigations Report 02-4130, Herbert S. Garn, July 2002. <a href="http://wi.water.usgs.gov/pubs/wrir-02-4130/wrir-02-4130.pdf">http://wi.water.usgs.gov/pubs/wrir-02-4130/wrir-02-4130.pdf</a>&gt;</li> <li>A U Michigan study shows that P levels in the Huron River dropped an average of 28% after Ann Arbor adopted an ordinance in 2006 that curtailed the use of P on lawns. &lt;Source: <a href="http://www.medindia.net/news/Water-Quality-In-US-Improves-After-Ban-On-Phosphorus-Containing-Lawn-Fertilizers-56683-1.htm">http://www.medindia.net/news/Water-Quality-In-US-Improves-After-Ban-On-Phosphorus-Containing-Lawn-Fertilizers-56683-1.htm</a>&gt;</li> <li>By limiting the unnecessary application of P to lawns by residents and commercial applicators, the city of Ann Arbor calculated that it could reduce the amount of P entering the river by 22%. &lt;see case study in Task 2 report&gt;</li> <li>After Minnesota implemented a law to prohibit use of P lawn fertilizer - and requires fertilizer of any type to be cleaned up immediately if spread or spilled on a paved surface, such as a street or driveway - the amount of P contained in lawn fertilizer used decreased from 292 tons in 2003 to 151 tons in 2006. Studies also show that the law has not increased consumers' cost. &lt;<a href="http://www.mda.state.mn.us/news/publications/protecting/waterprotection/07phoslawrptsumm.pdf">http://www.mda.state.mn.us/news/publications/protecting/waterprotection/07phoslawrptsumm.pdf</a>&gt;</li> <li>Cornell University surveys indicate that most established lawns don't need fertilizer. <a href="http://www.hvaweb.org/vegetation.html">http://www.hvaweb.org/vegetation.html</a></li> </ul>	<ul style="list-style-type: none"> <li>Consumers may not be familiar with appropriate brands.</li> <li>Brands may not be locally available.</li> <li>Perception that non/low P fertilizers don't work as well.</li> <li>Cost of P brands and zero-P brands may not always be equal at every retailer</li> <li>Competing messages about the need for P on lawns</li> <li>Assumption that all lawns need P</li> <li>Lack of soil testing options to determine need for P fertilizer</li> <li>Desire to have green lawns like neighbors and belief that P fertilizer helps achieve this</li> <li>Lack of recognition that home fertilization techniques are linked to water quality issues</li> </ul>	<ul style="list-style-type: none"> <li>Cost of P and zero-P fertilizers is generally the same</li> <li>Using no fertilizer at all saves money</li> <li>Easy to adopt change/"low-hanging fruit"</li> <li>Requires only a change in purchasing habits</li> <li>Most established lawns do not need additional P, so using a non-P fertilizer will not have a negative impact on the lawn</li> </ul>	<p>73% - use non-P fertilizer if understand impact on lake</p> <p>64% - use non-P fertilizer if reminded</p> <p>45% - switch with a trade in program</p>	Repetitive/Ongoing	(4)  (3)  (2)

Current Activity	Desired Behaviour Change	Source/issue	Potential Impact of Adopting Behaviour Change	Barriers	Benefits	Rondeau Bay Survey Results	Type of Change	Probability of Behavior Change * (0 - 4)
Use of P dishwasher detergents	Switch to non-P detergents	Several jurisdictions on the US side of the Great Lakes acknowledge the need to target P detergents and have banned or are seeking to ban them as one way of reducing P loads to the lakes. The federal government also acknowledges this need as it is proposing to reduce the P content of dishwasher detergents.	<ul style="list-style-type: none"> <li>In the Lake Champlain area, a study of 111,000 households that had dishwashers, which used the washer once per day, it was estimated that each dishwasher generates 10.2 grams (g) of phosphorus per week. The estimated reductions in P loading to Lake Champlain do not include reductions in loading from on-site septic systems.</li> <li>Alm (1998) suggested phosphorus contribution for South Burlington households was between 12.53 and 16.03 g/week.</li> <li>In Montana, phone surveys led to a mean phosphorus contribution of 10.98 g/week (Burnside and McDowell, 2001)</li> <li>Lake Champlain study found that reducing P from automatic dishwashers was an economically sound option to pursue when compared to other means of reducing P loading to the lake.</li> </ul> <p>Source for the above data:  <a href="http://www.lakechamplaincommittee.org/fileadmin/files/Publications/P_in_ADDs.pdf">http://www.lakechamplaincommittee.org/fileadmin/files/Publications/P_in_ADDs.pdf</a></p> <ul style="list-style-type: none"> <li>A ban on phosphates in dishwasher detergents in Sweden will mean a reduction in phosphorus emissions of 20 tonnes per year. (Source: <a href="http://www.helcom.fi/press_office/news_baltic/en_GB/BalticNews8139080/">http://www.helcom.fi/press_office/news_baltic/en_GB/BalticNews8139080/</a>)</li> <li>Dishwashers can be found in 55 per cent of Canadian households  <a href="http://www.canada.com/montrealgazette/news/story.html?id=c8dc7e58-3d00-42e6-8768-67d8b56e869b&amp;k=4887">http://www.canada.com/montrealgazette/news/story.html?id=c8dc7e58-3d00-42e6-8768-67d8b56e869b&amp;k=4887</a></li> </ul>	<ul style="list-style-type: none"> <li>Consumers may not be familiar with appropriate brands.</li> <li>Brands may not be locally available.</li> <li>Perception/reality that they don't work as well.</li> <li>Non/low-phosphate detergents tend to be more expensive than phosphate detergents.</li> <li>Perception that P-free detergents will increase wear and tear on dishwashers (something that has been argued by the Soap and Detergent Association in the US)</li> <li>New federal regulations for dishwashing detergent P levels take effect in July 2010, so some people might not see the use in switching brands at this point</li> </ul>	<ul style="list-style-type: none"> <li>Alternatives to P detergents are just as easy to use as P detergents</li> <li>Easy to adopt change/"low-hanging fruit"</li> <li>Requires only a change in purchasing habits</li> <li>Financial benefits may be realized by municipal wastewater treatment facilities that currently must remove P</li> </ul>	<p>77% - switch to non-P dishwasher soap if understand impact on lake</p> <p>58% - switch to non-P if reminded (prompt)</p>	Repetitive/Ongoing	<p>(4)</p> <p>(3)</p>
Faulty/Aging septic systems	Inspection and upgrade of septic systems if required	Rural Landowner Guides acknowledges septic systems as a source of contamination for Great Lakes  FOCA Factsheet	Your Septic System – CHMC <a href="http://www.cmhcschl.gc.ca/en/co/maho/gemare/gemare_009.cfm">http://www.cmhcschl.gc.ca/en/co/maho/gemare/gemare_009.cfm</a>  Credit River Phosphorus Offset Study – Jagger Hims Ltd.	<ul style="list-style-type: none"> <li>Cost of installing a new or upgraded system</li> <li>Cost of regular pumping/inspection to maintain septic system</li> <li>Cost of having a system inspected</li> <li>Inconvenience of testing a system</li> <li>Lack of knowledge</li> </ul>	<ul style="list-style-type: none"> <li>Reduced leaks water bodies</li> <li>A malfunctioning system can contaminate groundwater, which could affect drinking water supplies</li> <li>Improves health and safety of lakeshore/riparian shore for swimmers, boaters, etc.</li> <li>Reduces odours</li> <li>Reduces threat to drinking water and human health</li> <li>Fixing leaks could save money on more</li> </ul>	<p>65% - upgrade if financial incentive</p> <p>55% - upgrade if they understood impacts to lake water quality</p> <p>48% - upgrade if assistance provided</p>	Repetitive/Ongoing	<p>(3)</p> <p>(3)</p> <p>(2)</p>

Current Activity	Desired Behaviour Change	Source/issue	Potential Impact of Adopting Behaviour Change	Barriers	Benefits	Rondeau Bay Survey Results	Type of Change	Probability of Behavior Change * (0 - 4)
					expensive repairs in the future  An unusable septic system or one in disrepair will lower your property value  An unusable septic system or one in disrepair could pose a legal liability  Improves confidence in health and safety of system for owner			
Faulty/Aging septic systems	Regular maintenance	Rural Landowner Guide acknowledges septic systems as a source of contamination for Lake Huron  Acknowledged as P source at Experts Workshop		 Cost of having a system maintained  Inconvenience of maintaining system  Lack of knowledge about how to maintain system  Lack of knowledge about benefits of maintenance	 Reduces risk of system malfunctioning system and contaminating groundwater  Regular maintenance of septic system could save money on more expensive repairs in the future  Adds value to property if system is regularly maintained  Reduces legal liability  Improves confidence in health and safety of system for owner  Increases owner awareness of septic issues	65% - regular maintenance if understood impact on lake water quality  65% - maintain if financial incentive  44% - maintain if reminded to do so  31% - maintain if neighbours did it	Repetitive/Ongoing	(4)  (4)  (2)  (1)