Volunteer Water Quality Monitoring Program Report of 2008 Sampling Data

Township of The Archipelago
April 2009

Acknowledgements

This monitoring program represents a successful partnership between the Township of The Archipelago, cottager associations, and numerous volunteers in areas along the coast and inland lakes that has lasted since its inception in 1999. The volunteer-based program provides an important avenue for relaying information about our environment to ratepayers and for providing valuable information to the Township.

We owe continued thanks to all the volunteers who commit time and resources toward the ongoing success and long term vision that is water quality monitoring. Additionally, we are grateful to the ongoing support and interest of Dr. Karl Schiefer who provides advice on various technical aspects of the program and continues to be passionate about environmental quality on the Georgian Bay coast and inland waters.

The Township wishes to thank all of you for your passion and drive to ensure our high quality environment is maintained.

Report Compiled by Greg Mason, Georgian Bay GENERATIONS and the Township of The Archipelago

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Area Data

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1.0 Introduction

This report provides the summary of results from the 2008 Water Quality Monitoring Program for the Township of The Archipelago. The program purpose, rationale, and methods have been presented in previous year's reports and were followed for the 2008 season. Similar to past reports, the purpose here is to present the data gathered in the 2008 sampling season in detail but also to indicate summaries of past year's results to enable comparison of ongoing trends. It should be noted that this report was created by Township of The Archipelago staff and by Greg Mason of Georgian Bay GENERATIONS and no analysis or review is provided internally. An additional Water Quality Review is available from the Township. For information on this report and/or the volunteer water quality monitoring program in The Archipelago, please contact Ted Thompson at the Township of The Archipelago.

A draft report of some recent studies, completed by Ngan Diep of the Ministry of Environment, are available at the Township of The Archipelago. This work focused on the eastern coast of Georgian Bay and provides a better understanding of the changing water quality from open Georgian Bay into inner bays. It also looked into water quality differences between undeveloped and developed areas of the Bay. As well, The Archipelago commissioned Dr. Karl Schiefer to complete a comprehensive water quality review of the inland lakes; this report is also available through the Township office.

The Township is very committed to addressing environmental issues and ensuring the maintenance of the high quality environment we all enjoy. This philosophy is integrated into the day to day functioning of the municipality from public works operations to detailed planning analysis.

2.0 Results

The following results were tabulated from data gathered in 2008. Different locations were sampled with different intensity and for varying lengths of time. It is not the purpose of this report to provide analysis or draw conclusions from the data. Rather, what is provided are:

- outlines of the standards against which data can be compared; and
- tables outlining the different data sets and averages for each location for each sample area; and where possible, the averages from the previous sampling years.

It should be noted that in order to assess the relevance of the data, comparisons should be made between averages and standard deviations (not individual data points per se), previous year averages and against established standards.

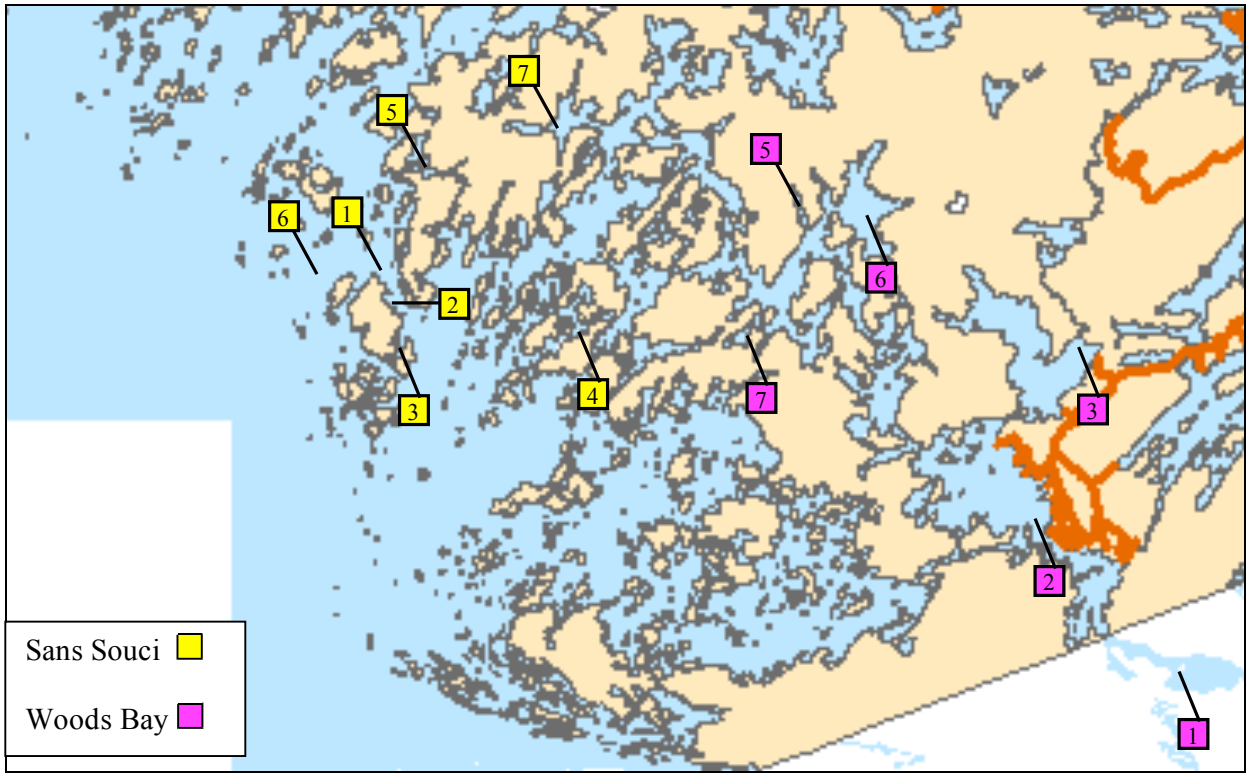
Charts are provided comparing water quality in the inland lakes, open bay sampling areas, and back bay sampling areas. When reviewing these data please keep in mind similarities and differences in the surrounding ecosystem and potential differences in sampling methodology (i.e. sampling times).

2.1 Sample Locations

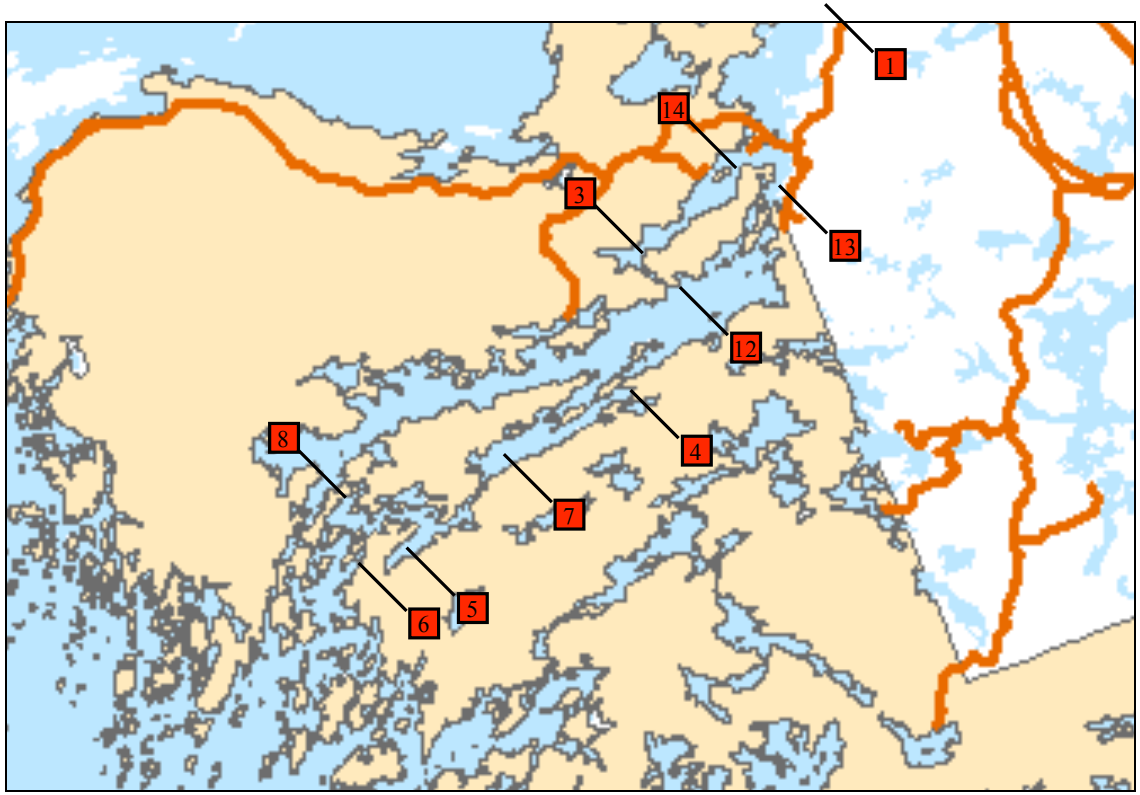
Sampling sites have typically been focused on known or expected “hot spots”; areas that may be more likely to suffer water quality impairment related to human activities. Some sample areas have also been selected as control stations; these allow comparison between the variety of ecosystem types that exist along the coast and within inland lakes. Maps of the sample areas indicate the sampling locations for the different areas throughout the township. The sample sites include many of the sampling stations used in

previous years and volunteers are encouraged to return to those sites in subsequent years. Unlike previous years, results for the different parameters are shown in table format, not on individual maps; refer to the maps when positioning the different samples.

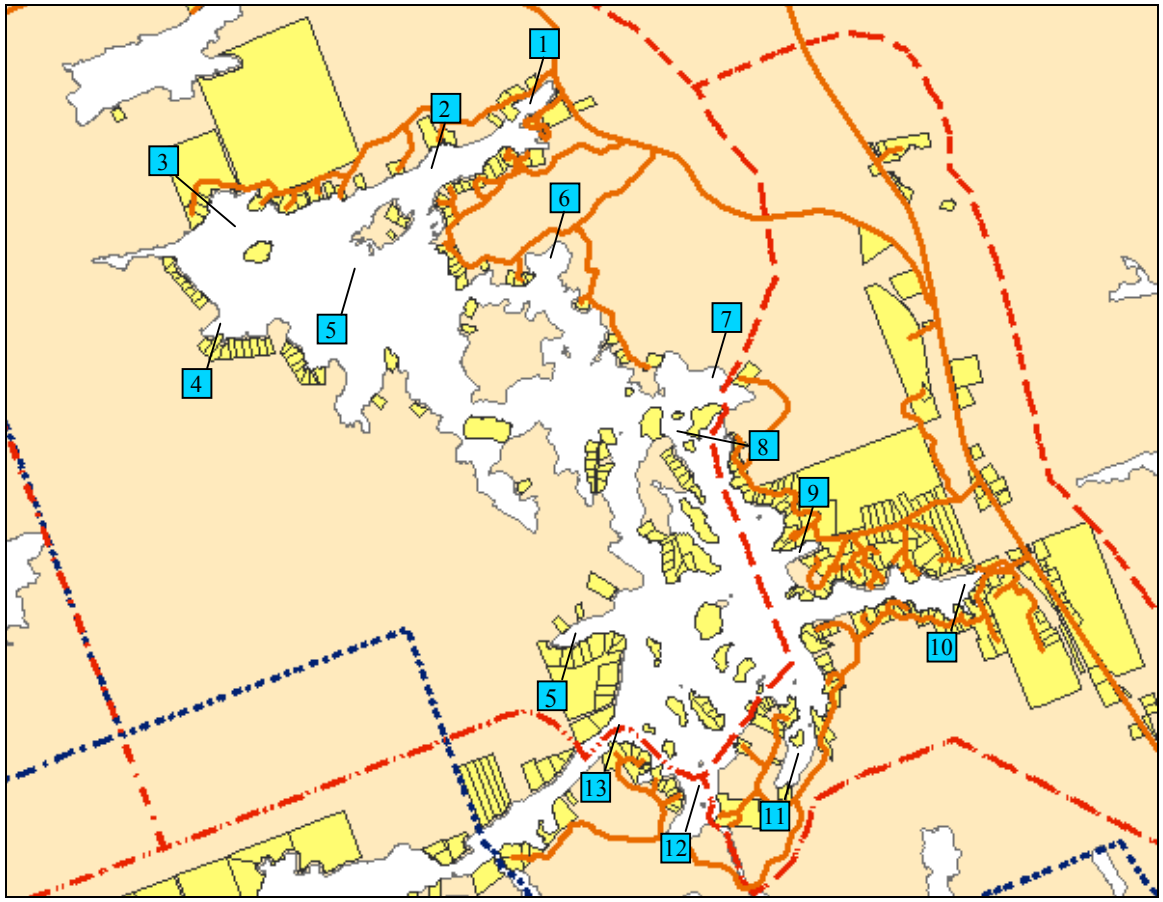
2.1.1 Sans Souci and Woods Bay Sampling Locations



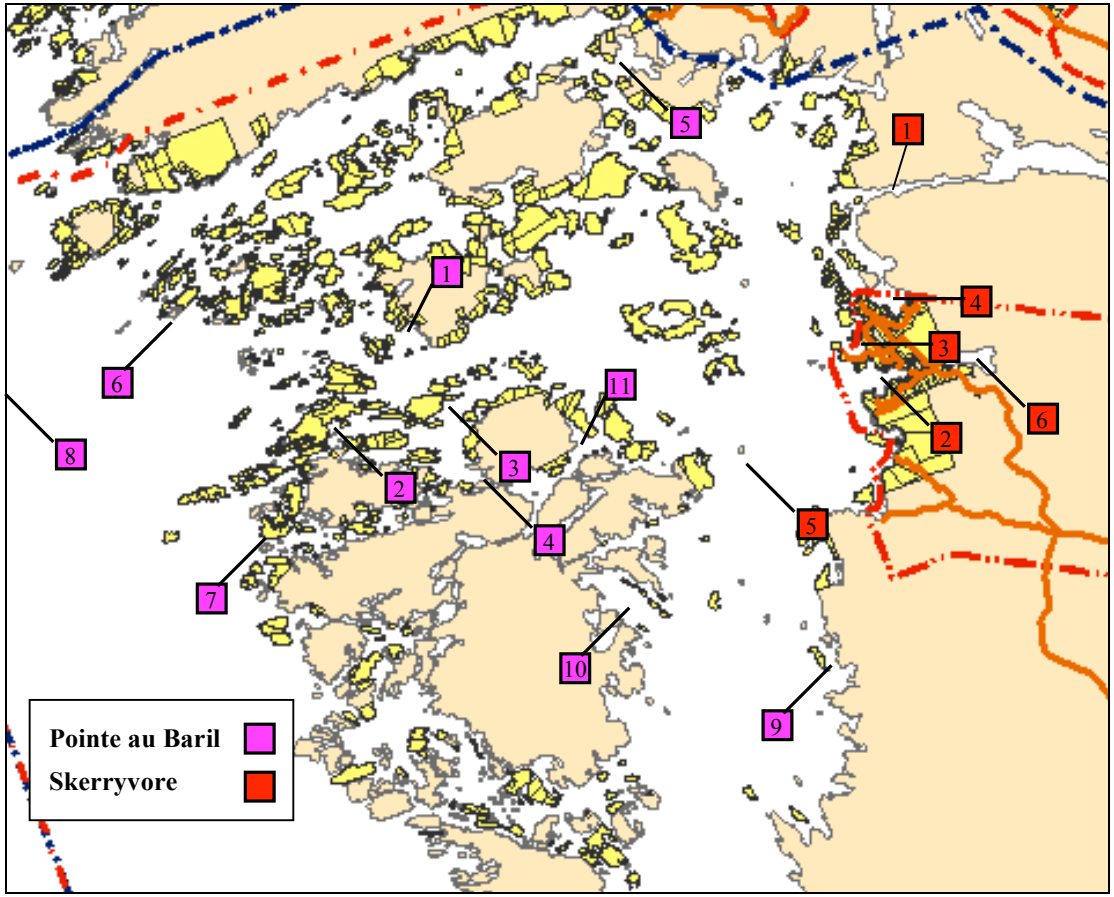
2.1.2 South Channel Sampling Locations



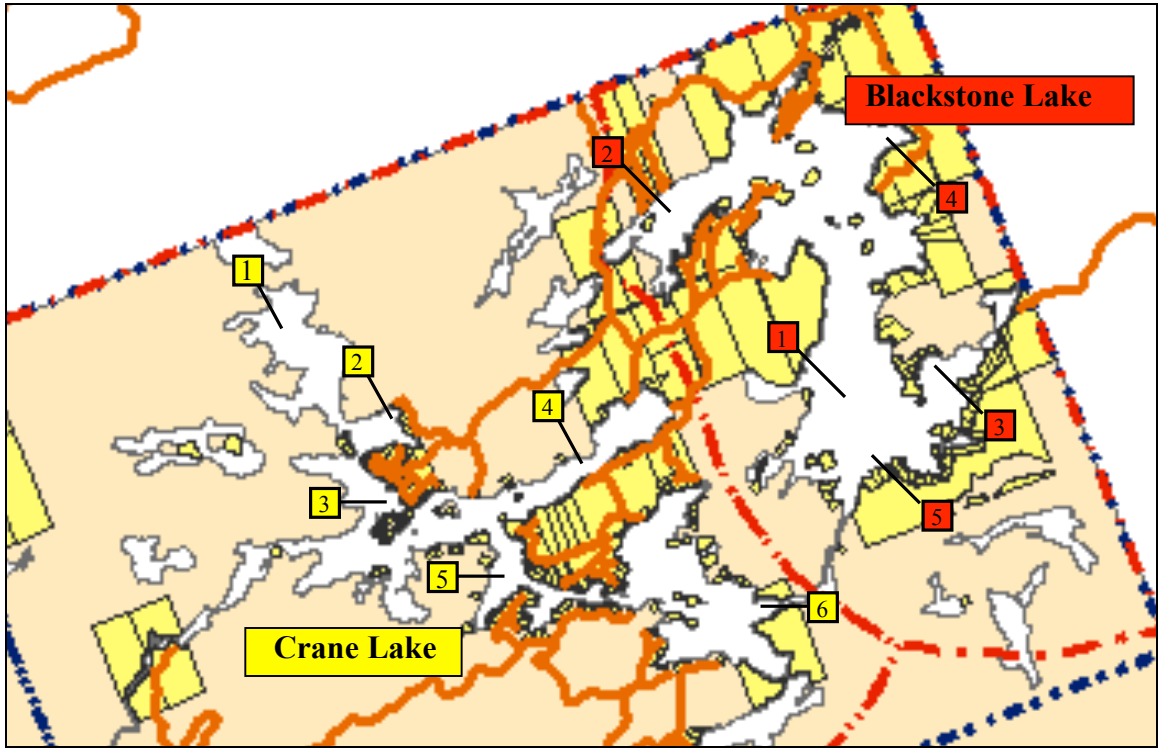
2.1.3 Sturgeon Bay Sampling Locations



2.1.4 Skerryvore and Pointe au Baril Islands Sampling Locations



2.1.5 Blackstone and Crane Lake Sampling Locations



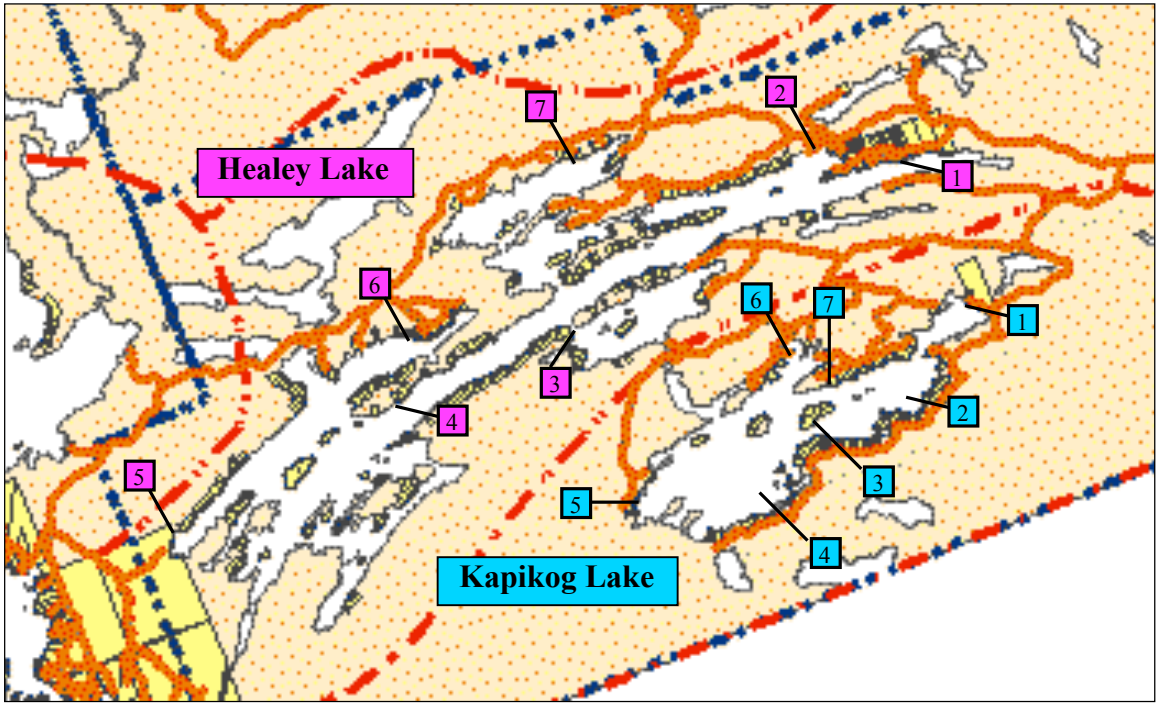
Blackstone Lake Sampling Sites:

1 Centre of Lake (Peanut Island) 2 McRoberts Bay 3 Lawson Bay(old)
4 Blackstone Landing 5 Mallet

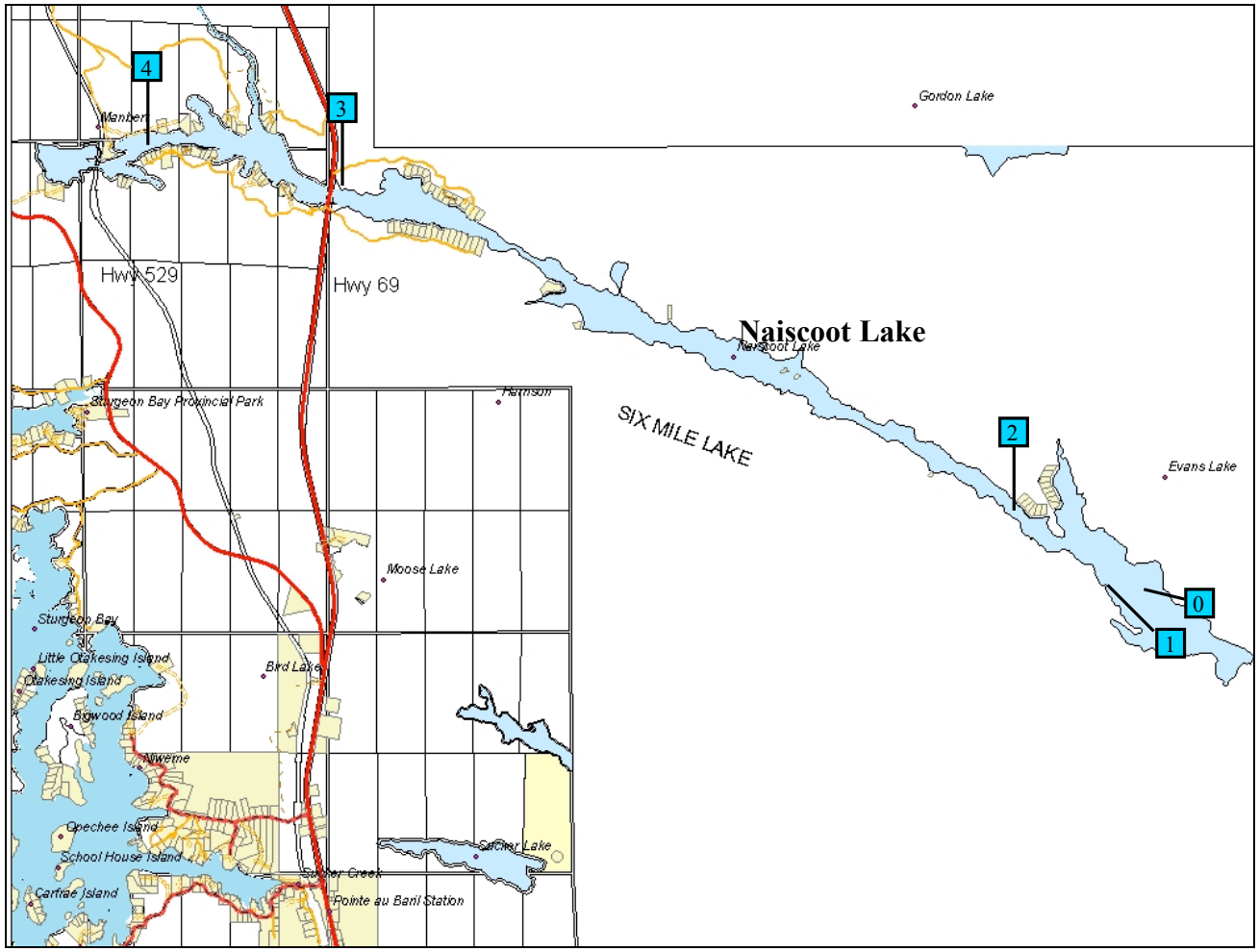
Crane Lake Sampling Sites:

1 North End 2 Goebel's Bay 3 Aga Ming Private Dock/Mead Bay
4 Crane Lake Resort 5 Overflow Bay (Narrows) 6 South End

2.1.6 Healey Lake and Kapikog Lake Sampling Locations



2.1.7 Naiscoot Lake Sampling Locations



2.2 Water Clarity

Water clarity is usually measured using a black-and-white Secchi disc which is lowered into the water until it just disappears from view. This depth is the Secchi depth of visibility, which is directly related to water clarity and can be used as a simple yet effective monitoring tool for determining the effects of human activities on water clarity and, indirectly, on eutrophication. In general, water clarity, as measured by Secchi depth, tends to be higher in open areas of Georgian Bay and in bays with good water circulation. Water clarity tends to diminish (smaller Secchi depth values) in enclosed bays, near wetlands or sources of organic material, and in lakes or areas that may naturally be more nutrient enriched. When examining the data, expect to see a small decline in Secchi depth throughout the year with lowest depths reading near the end of the summer and into September, however a major decline in the readings should be evaluated more carefully. A multi-year comparison of data is of particular value here to assess the water clarity trends for a particular area and where possible, data from previous years have been included with the tables.

2.2.1 Secchi Depths (Water Clarity) in the Sans Souci Area, 2008

	Station							Average for All Stations
Date	**1**	**2**	**3**	**4**	**5**	**6**	**7**	
08-Jun	7.6			4.6	4.6	9.1	3	5.8
22-Jun	7.6	6.1		3	2	7.6	4.6	5.2
06-Jul	6.1	6.1		4.6	3.7	9.1	4.6	5.7
19-Jul	7.6	6.1		3	4.6	9.1	4.6	5.8
03-Aug	7.6	7.6		4.6	4.6	9.1	4.6	6.4
17-Aug	9.1	9.1		4.6		9.1		8.0
31-Aug	9.1	9.1			6.1	10.6		8.7
14-Sep	7.6	7.6		4.6	4.6			6.1
Average	**7.8**	**7.4**		**4.1**	**4.3**	**9.1**	**4.3**	**6.5**
Std. Dev.	1.0	1.3		0.8	1.2	0.9	0.7	1.2
Previous Years Average								
2007	8.8	4.7	3.3	5	6	10.9	4.3	6.2
2006	8.5	6.2	3.7	4.5	5.3	9.1	5.0	6.0
2005	7.8	5.2	3.5	4.3	5.4	8.9	3.8	5.5
2004	8.9	5.5	3.5	4.5	5.2	12.1	5.0	6.5
2003	8.3	3.4	2.5	4.1	5.6	9.8	5.1	5.5
2002								7.8
2001								8.5

Depths in metres (m)

2.2.2 Secchi Depths (Water Clarity) for Woods Bay Area, 2008

	Station						Average for All stations
Date	**1**	**2**	**3**	**5**	**6**	**7**	
21-Jun	4	4	4	2	3	4	3.5
15-Jul	4	4	3.5	2.5	4.5	4.5	3.8
31-Jul	4	2	3	2.5	3.5	4	3.2
19-Aug	3	3	3	2	5	4	3.3
04-Sep	4	3	3	2	4	4	3.3
Average	**3.8**	**3.2**	**3.3**	**2.2**	**4.0**	**4.1**	**3.4**
Std. Dev.	0.4	0.8	0.4	0.3	0.8	0.2	0.3
Previous Years Average							
2007	3.3		2.8	4.2	4.2	4	3.7
2006	3.3			3.8	3.8	4	3.7
2005	2.8		3	3.6	3.3	3.3	3.2
2004	2.8	1.7	2.9	3.3	3.3	3.4	2.3
2003	3.1	1.9	3.2	3.9	3.6	3.6	3.2
2002		3.2			3.8	4.2	
2001		4.5			5.0		

Depths in metres (m)

2.2.3 Secchi Depths (Water Clarity) for the South Channel Area, 2008

	Station										
Date	**1**	**3**	**4**	**5**	**6**	**7**	**8**	**12**	**13**	**14**	**Average all Stations**
1-Jun	2.1	3	5.1	4.6	7	5.4	6.1	4	2.7	2.7	4.3
15-Jun	2.4	3	4.6	4.6	7.9	4.6	4.8	4	2.4	2.7	4.1
6-Jul	3	3	5.5	4.6	6.4	4.3	4.6	4.3	2.4	3	4.1
10-Aug	2.4	4	4	4.3	5.8	4	4.9	5.5	2.7	3.3	4.1
6-Sep	3.6	4	5.5	4.9	7.3	5.8	6.4	4.8	3.6	4.3	5.0
28-Sep	3.3	4.3	5.2	5.5	7.3	5.2	6.4	5.2	3.6	4.7	5.1
Average	**2.8**	**3.6**	**5.0**	**4.8**	**7.0**	**4.9**	**5.5**	**4.6**	**2.9**	**3.5**	**4.4**
Std. Dev.	0.6	0.6	0.6	0.4	0.7	0.7	0.9	0.6	0.6	0.9	0.5
Previous Years Average											
2006	3.1	3.8	5.5	4.4	6	4.7	5.8	5.1	3	3.6	
2005	3.3	3.7	5.0	4.5	6.5	4.7	5.1	4.6	2.8		4.5
2004	2.7	3.7	4.8	4.3	6.2	4.2	5.1	4.2	2.9		4.3
2003	2.7	3.3	4.5	4.5	6.1	4.2	4.9	3.8	2.9		4.0
2002	3.5				5.5	4.6		5.5			
2001	3.0				6.0						

2.2.4 Secchi Depths (Water Clarity) for the Sturgeon Bay Area, 2008

	Station														Average for All Stations
Date	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	
14 Jun**	1.0	1.0	1.0	1.2	1.6	1.1	1.2	1.2	1.3	0.5	1.1	1.6	1.6	1.0	1.1
22-Jul	1.7	1.7	1.8	1.8	1.7	1.6	1.8	1.6	1.7	0.9	1.9	2	2	1.8	1.6
13-Aug	1.2	1.2	1.2	1.2	2.0	1.2	1.5	1.7	1.6	1.1	1.7	1.7	1.7	1.6	1.4
26-Sep	1.0	0.7	0.5	0.3	1.5	1.1	1.7	1.7	1.7	1.0	1.8	2.0	2.0	1.8	1.1
Average	**1.2**	**1.2**	**1.1**	**1.1**	**1.7**	**1.3**	**1.6**	**1.6**	**1.6**	**0.9**	**1.6**	**1.8**	**1.8**	**1.6**	**1.3**
Std. Dev.	0.3	0.4	0.5	0.6	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.2	0.2	0.4	0.2
Previous Years Average															
2007	1.6	1.5	1.7	1.7	1.7	tb	1.8	2.0	1.9	1.5	1.9	1.9	2.2	1.8	1.7
2006	1.7	1.8	1.7	1.7	1.8	2.0	2.4	2.2	2.2	1.3	2.5	2.5	2.6	1.7	1.9
2005	2.1	2.3	2.5	2.5	2.4	1.6	2.6	2.2	2.4	2.7	2.5	2.5	2.5	2.2	2.4
2004	1.9	2.0	1.9	1.9	2.0	1.6	2.2	2.2	2.6	2.0	2.6	2.3	2.7	2.4	2.0
2003	1.2	1.4	1.5	1.5	1.5	1.3	1.6	1.6	1.9	1.6	1.9	2.1	2.0	1.5	1.6
2002	0.6				0.7						2.1				
2001	1.2				1.6						2.8				

** Rain

Depths in metres (m)

2.2.5 Secchi Depth (Water Clarity) in Skerryvore Area, 2008

	Stations					Average for All Stations
Date	1	2	3	4	5	
25-Jun	2.4			3.6		3.0
09-Jul	1.5	4.6		2.8		3.0
24-Jul	2.0	4.6			5.0	3.9
10-Aug	1.8	3.1		3.7	4.6	3.3
25-Aug	2.4	4.6		4.0	5.0	4.0
09-Sep	2.4	4.3		3.7	4.3	3.7
Average	**2.1**	**4.2**		**3.6**	**4.7**	**3.5**
Std. Dev.	0.4	0.7		0.5	0.3	0.4
Previous Years Averages						
2005	5.8	3.3	3.3		4.6	4.3
2004	3.6	4.5	3.0		4.5	3.9

Depths in metres (m)

2.2.6 Secchi Depth (Water Clarity) in Point au Baril Islands Area, 2008

	Station											Average for All Stations
Date	1	2	3	4	5	6	7	8	9	10	11	
30-Jun	4.6	2.7	5.8	4.0	2.6	3.0	2.6	1.7	2.4	3.3	1.7	3.1
14-Jul				3.7	3.5							3.6
28-Jul	4.1	3.0	5.2	4.0	4.3	2.7	2.1	1.9	2.2	3.2	1.5	3.1
11-Aug			13.4	4.9								9.2
25-Aug				4.3								4.3
Average	**4.4**	**2.9**	**8.1**	**4.2**	**3.5**	**2.9**	**2.4**	**1.8**	**2.3**	**3.3**	**1.6**	**3.4**
Std. Dev.	0.4	0.2	4.6	0.5	0.9	0.2	0.4	0.1	0.1	0.1	0.1	2.6

Depths in metres (m)

2.2.7 Secchi Depth (Water Clarity) in Blackstone Lake, 2008

	Station					Average for All Stations
Date	**1**	**2**	**3**	**4**	**5**	
16-Jul	5.0	5.0	5.0	5.0	5.0	5.0
29-Jul	5.4	5.4	5.4	5.4	5.4	5.4
18-Sep	4.8	4.8	4.8	4.8	4.8	4.8
10-Oct	5.1	5.1	5.1	5.1	5.1	5.1
Average	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**
Std. Dev.	0.3	0.3	0.3	0.3	0.3	0.3
Previous Years Average						
2007			6.0			6.0
2005	5.4	4.7	5.8	5.3	4.6	5.1
2004	4.1	4.6	4.4	3.8	4.4	4.3
2003	4.7	4.5	4.8	4.9	4.2	4.6

Depths in metres (m)

2.2.8 Secchi Depth (Water Clarity) in Crane Lake, 2008

	Station						Average for All Stations
Date	**1**	**2**	**3**	**4**	**5**	**6**	
15-Jun	4	4.5	4.3	4	3.5	4	4.1
29-Jun	3.3	4	4	4	4	4.8	4.0
13-Jul	4	3.5	4	4	4.3	5	4.1
04-Aug	5	4.5	4.8	4		5	4.7
18-Aug	4	4	4.5	4.8	4	4.3	4.3
01-Sep	5	5	5			6	5.3
Average	**4.2**	**4.3**	**4.4**	**4.2**	**4.0**	**4.9**	**4.4**
Std. Dev.	0.7	0.5	0.4	0.4	0.3	0.7	0.5
Previous Years Average							
2007	5.3	4.8	4.6	4.2	4.2	5.1	4.7
2006	4.2	4	4.2	4.1	4.3	5.1	4.3
2005	4.7	4.7	4.7	4.5	4.8	4.8	4.7
2004	4.3	4.4	4.1	4.4	4.1	4.4	4.3
2003	2.6	2.6	2.6	2.5	2.8	2.9	2.7

Depths in metres (m)

2.2.9 Secchi Depth (Water Clarity) in Healey Lake, 2008

Date	Station 1	2	3	4	5	6	7	Average for all stations
4-Jun	2.7	2.7	3	3.4	3.4	2.7	1.5	2.8
15-Jul	2.4	2.4	3	2.7	2.7	2.7	1.5	2.5
12-Aug	3	2.7	3	3.4	3	3	2.1	2.9
Average	**2.7**	**2.6**	**3.0**	**3.2**	**3.0**	**2.8**	**1.7**	**2.7**
Std.Dev.	0.3	0.2	0.0	0.4	0.4	0.2	0.3	0.2
Previous Years Average								
2007	3.3	3	3.5	3.375	3.1	3.2	1.7	3
2006	3.1	2.8	3.7	3.375	3.5	3.45	1.7	3.1
2005	3	2.9	3.5	3.58	3.2	3.52	1.6	3.0
2004	2.9	3.2	3	3.3	3.2	3.2	1.1	2.9
2003	2.6	2.5	3	2.9	3.1	2.7	1.3	2.8

2.2.10 Secchi Depth (Water Clarity) in Kapikog Lake, 2008

	Station								Average all stations
Date:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
7-Jul	3.7	4	3.7	t.b.	4	4.3	4	3.5	3.9
21-Jul	3.7	3.7	3.4	t.b.	3.7	4	3.7	3.5	3.7
5-Aug	4	4	4.4	t.b.	4.3	4.3	4.3	4.3	4.2
17-Aug	4	4.3	4.3	t.b.	4.3	4.3	4.3	4.3	4.3
3-Sep	4.6	4.3	4.3	t.b.	4.3	4.6	4.3	4.3	4.4
Average	**4.0**	**4.1**	**4.0**		**4.1**	**4.3**	**4.1**	**4.0**	**4.1**
Std. Dev.	0.37	0.25	0.44		0.27	0.21	0.27	0.44	0.3
Previous Years Averages									
2007	3.7	3.8	3.9		4.1	4	4	4	**4**
2006	4.0	4.0	3.9		4.3	4.2	4.2	4.2	**4.1**
2005	4.3	4.5	4.3		4.3	4.5	4.4	4.6	4.4
2004	3.8	3.7	4.2		3.8	4.3	4.3	4.2	**4.1**
2003	3.1	3.4	3.3	2.9	3.1	3.2	3.1	3.4	**3.2**

2.2.11 Secchi Depth (Water Clarity) in Naiscoot Lake, 2008

	Station					Average for All stations
Date	**0**	**1**	**2**	**3**	**4**	
16-Jul	3.2	3.1	2.9	3.2	2.4	3.0
27-Jul	3.1	3	3.1	2.9	3.2	3.1
17-Aug	4	4.1	4	3.1	3	3.6
30-Aug	4	3.8	4.2	4	3.9	4.0
Average	**3.6**	**3.5**	**3.6**	**3.3**	**3.1**	**3.4**
Std. Dev.	0.5	0.5	0.6	0.5	0.6	0.5
Previous Years Average						
2007	4.1	3.9	3.9	3.9	3.6	3.9

Depths in metres (m)

2.3 Bacterial Monitoring

Results of bacterial monitoring in a number of locations of the Township of The Archipelago are provided by location in this section of the report

2.3.1 Bacterial Reference Guidelines and Objectives

The following bacterial guidelines and objectives are provided to assist in the interpretation of bacterial monitoring results presented in this report.

Provincial Regulatory Guideline levels for total coliforms (TC) are as follows:

- 1,000 – levels higher than this are considered unsuited for recreational water use;
- 200 – levels higher than this are considered to be indicative of deteriorating water quality; and
- 10 – levels higher than this are considered unsafe for human consumption

NOTE: total coliforms are no longer used as a regulatory guideline in Provincial Water Quality Objectives. Total coliform levels have been found to be too variable and are largely considered to be a natural component of ecosystems

The objectives for *E. coli* (EC) are as follows:

- 100 – levels higher than this are considered unsuited for recreational water use
- 0 – levels higher than this are considered unsafe for human consumption without prior treatment.

NOTE: provincial bacterial levels are to be based on a geometric mean of five samples taken in the same local area at the same time.

Based on a number of years of intensive bacterial monitoring throughout the Township of Georgian Bay and the Township of The Archipelago, the following has been recommended as a suggested bacterial objective for recreational waters of Georgian Bay and the associated inland lakes:

- **Total Coliforms (annual average): - 100 TC**
- ***E. Coli* (annual average): - 10 EC**

The following tables present the data by sample area for each sampling location and date within that area. A calculated standard deviation and average is presented for each sample locations and an average of all sampling locations for each general area is also provided.

Recent heavy rain events are indicated by (**) beside the sampling dates and medium to light recent rain events are indicated by (*) beside each sample date.

2.3.2 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Sans Souci Area, 2008

	Station														Average for All Stations	
	1		2		3		4		5		6		7			
Date	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
*08-Jun	52	16	43	5	13	3	39	8	298	171	0	0	22	0	66.7	29.0
**22-Jun	55	3	55	3	30	8	39	0	83	0	3	3	8	0	39.0	2.4
06-Jul	8	0	5	0	25	0	11	0	30	0	3	0	22	0	14.9	0.0
19-Jul	65	5	33	0	72	13	22	3	76	3	8	0	30	0	43.7	3.4
03-Aug	8	0	28	0	30	0	11	3	182	0	0	0	587	5	120.9	1.1
**17-Aug	2424	90	16	0	33	0	36	8	52	11	28	0	16	3	372.1	16.0
31-Aug	5	0	36	0	52	0	46	3	213	0	0	0	106	0	65.4	0.4
*14-Sep	166	3	72	0	79	0	39	3	59	3	22	0	13	3	64.3	1.7
Average	**347.9**	**14.6**	**36.0**	**1.0**	**41.8**	**3.0**	**30.4**	**3.5**	**124.1**	**23.5**	**8.0**	**0.4**	**100.5**	**1.4**	**98.4**	**6.8**
Std. Dev.	840.5	30.9	21.2	1.9	23.5	4.9	13.7	3.1	95.5	59.7	10.9	1.1	199.1	2.0	114.8	10.4
Previous Years Averages																
2007 avg	12.6	1.0	29.8	2.2	37.0	2.2	51.4	1.2	106.4	3.2	9.4	0.0	131.6	0.6	54.0	1.5
2007 std	8.6	2.2	32.5	2.2	37.6	2.2	36.8	1.6	126.0	5.6	9.1	0.0	154.8	1.3	38.6	1.2
2006 avg	86.7	1.4	33.6	1.6	47.9	2.3	40.4	0.9	132.1	3.0	18.9	0.9	453.6	23.3	116.2	4.8
2006 std	122.1	2.4	28.5	2.1	31.8	2.3	15.0	1.5	122.3	2.2	15.4	1.5	882.7	54.2	128.7	8.2
2005 avg	39.3	0.9	27.1	2.0	40.7	1.6	77.0	5.0	61.9	3.6	15.2	0.0	56.1	2.4	46.4	2.4
2005 std	27.3	1.5	15.3	2.0	42.4	2.1	66.3	6.9	48.0	4.4	22.5	0.0	39.9	4.0	20.2	2.5
2004 avg	24.7	0.4	40.1	1.6	42.6	2.7	72.3	2.4	67.7	4.6	9.0	0.0	48.0	1.3	43.5	1.9
2004 std	21.4	1.1	25.5	2.1	27.1	3.0	52.8	2.9	51.6	5.2	12.0	0.0	35.2	1.6	19.4	1.0
2003 avg	415.0	19.3	37.6	0.6	35.6	2.8	366.6	45.6	109.7	12.3	8.6	3.6	8.6	3.6	140.9	10.3
2003 std	889.0	24.3	38.1	1.3	37.4	4.8	744.0	71.8	70.9	19.8	6.8	5.7	6.8	5.7	133.64	12.46
2002 avg	32.7	0.3	28.0	1.6	15.6	2.4	16.5	1.1	300.0	4.4	4.4	0.0	41.3	1.4	70.9	1.7
2002 std	48.0	1.0	35.0	3.0	11.9	4.5	12.0	1.6	748.0	5.7	3.4	0.0	27.7	2.0	316.0	3.4
2001 avg	14.9	0.0	240.0	1.3	49.5	3.7	42.1	5.1	139.0	1.3	11.7	0.0	81.2	1.4	82.6	1.8
2001 std	14.4	0.0	724.0	1.8	43.3	5.7	24.7	5.1	204.0	2.2	9.0	0.0	55.1	1.9	260.3	2.2

2.3.3 Bacterial Sampling of Surface Water for Total Coliforms(TC) and E. Coli (EC) in the Woods Bay Area, 2008

	Station														Average for All Stations	
	1		2		3		5		6		7		8			
Date	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
21-Jun	*most EC counts were higher than TC counts - results not used*															
15-Jul	62	5	13	5	59	11	33	3	25	22	43	19	69	11	43.5	9.5
31-Jul	69	16	136	13	289	28	114	13	49	11	102	3	94	3	125.2	14.0
19-Aug	213	76	219	11	213	30	151	28	33	3	30	5	39	3	144.7	25.2
04-Sep	200	19	52	0	123	25	151	19	62	5	233	5	94	5	113.7	12.2
Average	**136.0**	**29.0**	**105.0**	**7.3**	**171.0**	**23.5**	**112.3**	**15.8**	**42.3**	**10.3**	**102.0**	**8.0**	**74.0**	**5.5**	**106.8**	**15.2**
Std. Dev.	81.6	31.9	91.7	5.9	100.9	8.6	55.6	10.5	16.5	8.5	92.8	7.4	26.1	3.8	44.1	6.9
Previous Years Averages																
2007 avg	53.8	9.6	108.3	18.3	77.0	30.4	48.5	12.8	171.0	5.5	43.3	9.3			85.2	16.3
2007 std	31.2	7.8	107.1	20.1	97.6	25.6	71.7	20.3	278.1	3.8	30.8	6.2			59.8	12.1
2006 avg	91.0	28.3	85.3	5.8	43.8	14.3	43.5	5.8	35.0	2.0	19.3	7.3			53.0	10.5
2006 std	69.2	31.4	20.6	1.5	11.6	5.3	27.2	3.8	34.0	2.4	10.2	2.9			25.2	6.8
2005 avg	77.8	15.3	68.6	5.4	62.8	8.5	104.2	22.2	35.8	3.5	88.6	12.4			73.6	12.6
2005 std	49.7	14.3	58.2	6.2	32.3	5.3	58.5	38.2	35.9	5.2	95.3	9.2			26.0	10.1
2004 avg	155.8	9.4	95.0	6.2	46.4	11.6	73.6	9.6	189.0	13.4	66.6	10.8			66.6	10.8
2004 std	199.3	3.5	54.6	3.9	27.8	8.2	49.6	5.5	209.9	10.7	49.7	7.5			49.7	7.5
2003 avg	198.4	28.6	174.8	13.4	182.6	17.0	237.4	13.8	170.4	12.0	132.2	7.0			182.6	15.3
2003 std	176.7	37.7	65.6	16.3	57.3	13.0	170.0	13.3	86.7	13.9	98.1	8.1			77.1	15.9
2002 avg	75.0	4.8	108.0	6.0	46.6	8.0	107.2	11.4	73.4	1.2	66.6	8.2			79.3	6.6
2002 std	48.0	4.9	37.0	4.7	26.1	8.0	39.7	9.9	33.1	1.6	35.4	7.4			40.5	6.9
2001 avg	158.0	5.8	113.0	5.6	21.4	3.4	70.5	6.0	39.1	2.1	60.4	3.6			77.1	4.4
2001 std	171.0	7.2	91.2	2.7	17.0	5.4	21.3	6.1	16.9	2.8	33.1	4.3			62.0	1.8

2.3.4 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E.Coli (EC) in the South Channel Area, 2008

	Station																				Average All Stations	
	1		3		4		5		6		7		8		12		13		14			
Date	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
1-Jun	156	16	46	3	11	0	13	0	8	0	16	0	13	0	33	5	323	25	55	22	67.4	7.1
15-Jun	161	19	22	0	55	0	30	3	30	3	25	3	489	3	90	13	350	25	62	3	131.4	7.2
6-Jul	146	16	55	3	39	3	5	0	13	0	22	0	28	0	46	3	62	8	362	5	77.8	3.8
10-Aug	434	72	79	13	350	22	119	33	94	11	94	3	72	5	52	3	289	0	22	3	160.5	16.5
6-Sep	434	13	90	3	110	0	5	0	28	3	39	8	79	11	127	19	136	8	177	3	129.8	10.3
28-Sep	794	146	52	0	13	0	5	0	19	0	13	3	52	5	33	0	98	16	39	8	82.6	9.6
Average	**354.2**	**47.0**	**57.3**	**3.7**	**96.3**	**4.2**	**29.5**	**6.0**	**32.0**	**2.8**	**34.8**	**2.8**	**122.2**	**4.0**	**63.5**	**7.2**	**209.7**	**13.7**	**119.5**	**7.3**	**108.2**	**9.1**
Std. Dev.	255.4	53.5	24.3	4.8	129.4	8.8	44.9	13.3	31.5	4.3	30.4	2.9	181.5	4.1	37.5	7.3	125.3	10.1	130.8	7.4	37.4	4.3
2007																						
Average	**1495.9**	**73.8**	**74.0**	**2.4**	**84.1**	**3.6**	**38.7**	**2.4**	**34.7**	**2.3**	**62.9**	**3.1**	**107.6**	**4.0**	**87.4**	**10.6**	**178.2**	**19.0**	**64.3**	**2.6**	**222.8**	**12.4**
Std. Dev.	1108.8	60.5	45.1	2.8	81.5	4.1	23.3	2.8	25.3	4.4	47.3	4.0	148.6	4.8	51.1	8.7	132.0	19.1	38.2	2.5	124.7	5.7
2006																						
Average	**477.0**	**56.9**	**250.8**	**4.4**	**35.9**	**3.3**	**87.3**	**0.4**	**48.3**	**2.8**	**40.4**	**3.8**	**43.6**	**1.0**	**57.4**	**6.1**	**264.1**	**12.9**	**452.1**	**29.5**	**175.7**	**12.1**
Std. Dev.	397.7	36.1	334.8	4.8	30.2	3.0	171.6	1.1	42.9	2.8	29.5	6.5	47.0	1.9	57.5	7.9	375.8	10.5	807.2	60.3	145.0	9.2
2005																						
Average	**819.5**	**219.7**	**125.7**	**1.2**	**203.1**	**0.0**	**632.7**	**4.2**	**72.5**	**0.3**	**320.2**	**4.3**	**271.4**	**3.2**	**69.1**	**2.7**	**61.7**	**7.8**	**70.0**	**1.0**	**278.8**	**25.5**
Std. Dev.	1110.4	305.1	263.6	1.5	423.5	0.0	1034.3	10.2	118.8	0.9	745.1	10.3	757.8	6.2	92.6	4.1	34.0	8.9	39.3	1.7	319.6	31.3
2004																						
Average	**529.1**	**43.7**	**1114.3**	**8.2**	**1202.6**	**2.8**	**1115.9**	**2.7**	**833.3**	**4.2**	**901.9**	**1.1**	**564.3**	**3.3**	**1408.6**	**10.7**	**1058.2**	**27.1**			**969.8**	**11.5**
Std. Dev.	777.4	23.8	1243.0	8.7	1186.8	4.1	1062.9	4.3	1193.3	7.7	1146.7	2.2	763.6	5.1	1205.3	13.1	1059.2	52.5			609.6	6.9
2003																						
Average	**677.9**	**38.0**	**48.3**	**5.0**	**26.1**	**0.9**	**94.6**	**14.0**	**353.3**	**0.0**	**374.1**	**1.7**	**23.4**	**0.4**	**450.9**	**6.0**	**77.1**	**8.6**			**231.2**	**8.0**
Std. Dev.	834.1	26.3	65.6	11.2	17.3	1.5	122.2	37.0	913.1	0.0	904.4	2.0	24.6	1.1	883.3	4.5	39.1	9.5			213.4	5.8
2002																						
Average	**1789.0**	**91.0**	**794.0**	**3.4**	**489.0**	**0.9**	**136.0**	**0.9**	**726.0**	**1.6**	**748.0**	**0.9**	**631.4**	**2.4**	**462.0**	**14.6**	**1210.0**	**17.7**			**780.0**	**14.0**
Std. Dev.	1085.0	59.0	784.0	2.9	862.0	1.5	89.0	1.5	1160.0	3.0	942.0	1.5	923.3	1.8	870.0	14.2	972.0	21.1			961.0	32.0
2001																						
Average	**2148.0**	**113.0**	**860.0**	**11.9**	**1021.0**	**5.3**	**874.0**	**8.9**	**866.0**	**9.9**	**1139.0**	**3.0**	**375.0**	**3.0**	**998.0**	**11.0**	**1330.0**	**27.4**			**1067.9**	**21.5**
Std. Dev.	731.0	87.1	887.0	16.2	1009.0	10.1	1066.0	9.2	1081.0	9.0	1209.0	1.7			999.0	11.1	1039.0	34.5			142.1	27.9

2.3.5 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Sturgeon Bay Area, 2008

	Station																			
	1		2		3		4		5		6		7		8		9		10	
Date	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**
14-Jun*	76	16	42	11	90	39	30	3	11	0	55	19	65	16	72	13	79	25	132	16
22-Jul	114	0	39	0	161	0	418	0	36	8	94	0	22	8	102	3	102	11	13	0
13-Aug	46	11	49	3	43	3	25	3	13	0	123	36	136	5	52	0	94	5	59	8
26-Sep	76	3	46	0	46	0	55	0	11	0	8	0	62	3	62	5	55	11	127	3
Average	**78.0**	**7.5**	**44.0**	**3.5**	**85.0**	**10.5**	**132.0**	**1.5**	**17.8**	**2.0**	**70.0**	**13.8**	**71.3**	**8.0**	**72.0**	**5.3**	**82.5**	**13.0**	**82.8**	**6.8**
Std. Dev.	27.9	7.3	4.4	5.2	55.0	19.1	191.1	1.7	12.2	4.0	49.8	17.3	47.4	5.7	21.6	5.6	20.7	8.5	57.2	7.0
Previous Years Averages																				
2007 avg	507.5	35.0	60.5	8.8	193.8	8.3	137.0	9.0	69.3	2.0	100.0	6.8	137.0	24.8	152.8	15.8	93.8	18.8	125.0	8.5
2007 std	793.5	28.7	55.4	8.2	217.9	11.8	110.2	18.0	44.5	4.0	5.2	3.5	66.1	32.2	177.0	15.3	39.0	27.2	54.1	7.3
2006 avg	218.2	17.5	500.7	132.5	85.5	15.0	88.8	14.2	94.8	63.0	156.2	19.8	225.2	22.8	127.8	43.8	218.8	47.8	783.2	98.0
2006 std	267.0	21.6	947.8	277.1	55.8	21.5	60.8	22.3	175.1	140.9	164.0	27.4	242.7	16.3	111.2	74.2	128.7	71.9	1019.4	106.6
2005 avg	271.3	24.3	383.7	11.3	46.6	7.6	29.7	7.7	41.0	7.3	124.7	26.1	105.6	18.9	46.1	11.3	117.7	16.3	277.4	17.6
2005 std	268.1	27.2	899.9	8.9	56.5	8.8	24.0	12.1	61.3	7.6	93.2	30.5	93.1	11.4	22.3	9.5	133.4	23.1	486.3	20.0
2004 avg	159.4	5.0	267.4	2.0	395.0	2.3	311.1	1.6	186.0	0.4	88.6	3.6	247.9	11.3	174.7	2.6	419.7	4.3	186.6	11.3
2004 std	135.6	3.6	487.5	2.0	619.3	4.9	385.7	2.1	146.8	1.1	48.0	3.7	330.5	12.6	235.7	3.4	884.3	1.9	132.8	10.0
2003 avg	1107.5	4.6	466.5	2.6	744.3	0.4	991.8	1.4	963.4	0.4	570.6	6.8	332.8	2.6	688.0	1.6	664.3	11.5	914.6	6.8
2003 std	1133.1	6.6	807.9	3.7	1046.0	1.1	1190.7	2.0	1210.4	1.1	799.9	11.5	419.7	5.0	1077.9	3.1	1086.9	26.4	1036.3	11.5
2002 avg	1039.0	9.7	871.0	5.4	548.0	1.8	619.0	2.4	941.0	1.8	488.0	4.1	226.0	6.0	212.0	11.6	186.0	11.5	204.0	6.0
2002 std	1066.0	10.4	1031.0	8.0	826.0	2.9	669.0	2.1	1229.0	3.9	569.0	6.1	332.0	6.0	193.0	16.8	242.0	14.8	220.0	7.1

Data continued on the following page

Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Sturgeon Bay Continued

		Station								Average for All Stations	
		11		12		13		14			
Date		TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
14-Jun*		22	5	55	8	19	5	171	16	65.6	13.7
22-Jul		226	0	19	0	49	0	127	5	108.7	2.5
13-Aug		65	3	110	8	49	3	52	0	65.4	6.3
26-Sep		22	0	13	0	46	5	52	0	48.6	2.1
Average		**83.8**	**2.0**	**49.3**	**4.0**	**40.8**	**3.3**	**100.5**	**5.3**	**72.1**	**6.2**
Std. Dev.		97.0	2.4	44.5	4.6	14.6	2.4	58.8	7.5	25.7	5.4
Previous Years Averages											
2007	**avg**	30.3	4.0	65.0	9.5	54.3	1.3	34.3	2.8	125.7	11.1
	std	5.5	3.4	29.7	10.0	39.2	2.5	10.4	2.1	81.7	10.5
2006	**avg**	346.2	8.2	139.8	10.5	72.0	3.8	507.3	26.7	254.6	37.4
	std	662.3	10.1	108.7	6.8	31.7	3.2	940.0	23.2	208.5	52.8
2005	**avg**	48.0	9.0	56.0	18.4	74.6	12.9	34.7	7.3	118.6	14.2
	std	28.9	9.4	32.4	16.4	93.0	12.4	11.7	7.6	92.8	11.3
2004	**avg**	183.7	3.9	109.3	1.6	183.4	2.0	148.0	4.4	218.6	4.0
	std	248.2	4.4	111.3	2.1	299.9	2.0	161.7	4.4	250.5	1.6
2003	**avg**	508.4	4.3	742.4	5.1	519.8	3.0	1084.1	1.1	729.3	3.8
	std	888.3	8.1	1149.8	13.6	897.3	6.7	1254.5	3.0	836.4	5.5
2002	**avg**	355.0	4.8	209.0	6.8	145.0	3.0	328.0	8.2	456.0	6.0
	std	837.0	6.4	343.0	10.0	201.0	5.0	469.0	15.8	708.0	9.4

2.3.6 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Skerryvore Area, 2008

	Stations												Average for All Stations	
	1		2		3		4		5		6			
Date	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
14-Jun	8	0	28	3	11	0	19	0	19	0	1370	22	242.5	4.2
03-Jul	43	5	318	59	151	33	39	19	25	3	200	5	129.3	20.7
17-Jul	30	0	36	0	59	11	13	3	0	0	194	3	55.3	2.8
07-Aug	110	5	102	8	489	94	110	25	16	3	375	11	200.3	24.3
28-Aug	362	5	13	0	25	3	28	5	8	0	219	16	109.2	4.8
11-Sep	794	8	46	0	69	13	123	36	19	0	146	8	199.5	10.8
Average	**224.5**	**3.8**	**90.5**	**11.7**	**134.0**	**25.7**	**55.3**	**14.7**	**14.5**	**1.0**	**417.3**	**10.8**	**156.0**	**11.3**
Std. Dev.	307.9	3.2	115.5	23.4	180.7	35.4	48.4	14.3	9.0	1.5	473.2	7.1	69.8	9.2
Previous Years Averages														
2007 avg	395.5	6.0	49.0	2.3	93.3	13.3	78.5	18.5	22.2	1.0	994.5	125.3	272.2	27.8
2007 std	430.8	6.9	25.4	3.1	77.7	12.7	85.7	23.7	28.4	1.5	1109.7	119.4	153.7	22.6
2006 avg	140.2	30.3	53.0	6.3	79.8	16.2	72.2	20.2	10.0	2.3	592.8	33.3	158.0	18.1
2006 std	112.9	52.5	66.6	7.9	64.3	23.4	106.8	32.9	7.1	2.0	899.9	29.1	140.1	20.2
2005 avg	1007.0	15.4	1051.6	60.0	1007.8	519.8	1010.6	51.0	1110.6	52.2	1501.2	61.0	1114.8	126.6
2005 std	1294.2	11.3	1253.7	68.6	1292.9	1065.5	1290.3	61.4	1215.3	38.1	985.2	80.1	1196.5	189.8
2004 avg	158.8	6.7	174.3	8.8	484.3	22.2	68.7	6.7	225.3	1.0	1296.0	35.2	401.3	13.4
2004 std	70.4	6.6	224.4	12.4	951.9	34.1	71.7	6.6	465.4	1.5	1029.3	46.2	258.9	9.1
2003 avg	359.7	5.0	73.4	8.6	179.5	34.2	72.9	19.0	13.3	1.1	326.1	10.6	147.0	12.1
2003 std	260.7	1.8	42.7	9.7	183.0	35.6	41.3	11.8	4.7	1.2	138.1	3.5	57.2	7.3
2002 avg	1905.0	10.8	65.2	7.3	81.2	10.8	332.0	10.8	878.0	3.2	1392.0	40.3	775.0	13.9
2002 std	961.0	9.1	65.0	9.6	66.8	8.8	465.0	7.3	1003.0	4.4	1156.0	37.3	993.0	19.9
2001 avg	52.2	4.4	78.4	8.2	55.4	1.6	42.4	7.6	523.0	0.6	2070.0	40.6	470.2	10.5

2.3.7 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Pointe au Baril Islands Area, 2008

	Station											
	1		2		3		4		5		6	
Date	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
30-Jun	55	19	13	8	0	0	22	5	16	3	11	3
14-Jul	13	3	49	11	3	0	8	0	22	3	62	11
28-Jul	5	0	11	3	0	0	3	0	36	0	11	5
11-Aug	30	3	16	8	8	3	30	0	13	3	19	3
25-Aug	8	3	25	8	3	0	25	3	11	0	65	11
Average	**22.2**	**5.6**	**22.8**	**7.6**	**2.8**	**0.6**	**17.6**	**1.6**	**19.6**	**1.8**	**33.6**	**6.6**
Std. Dev.	20.7	7.6	15.6	2.9	3.3	1.3	11.5	2.3	10.1	1.6	27.5	4.1
Previous Years Averages												
2007 avg	16.4	5.4	39.0	3.4	23.4	6.2	21.4	5.4	37.6	6.0	53.0	17.0
2007 std	9.2	9.5	45.7	0.9	10.8	3.9	8.7	3.3	32.0	3.5	24.8	22.3
2006 avg	6.4	3.0	23.8	8.2	19.2	6.4	59.8	5.6	19.5	2.0	37.0	4.0
2006 std	4.2	0.0	11.4	8.0	12.3	4.2	33.7	1.3	9.4	2.4	20.1	1.2
2005 avg	176.4	17.4	54.8	19.6	494.8	2.2	45.5	9.0	34.5	2.0	376.6	8.2
2005 std	177.7	32.8	46.1	18.0	1079.1	2.2	61.3	11.2	40.0	2.4	739.0	12.3
2004 avg	564.1	9.6	441.0	6.4	526.7	7.4	417.1	24.3	468.0	14.0	455.4	96.7
2004 std	893.8	10.9	600.3	3.9	915.1	7.4	548.5	31.6	865.5	18.8	868.7	216.3
2003 avg	64.3	7.3	93.7	11.0	57.0	2.7	60.7	13.7	60.3	3.3	856.0	815.3
2003 std	29.2	12.7	46.1	12.2	23.1	2.5	30.0	14.4	33.4	2.9	1357.9	1393.1
2002 avg	56.3	3.0	135.0	2.7	47.7	3.7	52.0	1.7	58.3	3.3	60.0	3.7
2002 std	41.0	0.0	196.0	4.6	22.3	1.2	39.3	2.9	56.1	2.9	12.3	4.0
2001 avg	178.0	0.5	40.3	5.8	21.3	1.0	55.7	9.7	28.5	2.3	136.0	10.5
2001 std	335.6	1.2	28.1	9.5	17.5	1.5	29.8	7.0	13.8	2.0	237.0	20.4

Data continued on the following page.

Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Pointe au Baril Island Area of Georgian Bay Continued

	Station										Average for All Stations	
	7		8		9		10		11			
Date	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
30-Jun	8	0	22	3	28	11	8	5	8	0	17.4	5.2
14-Jul	5	0	33	16	11	0	13	0	30	11	22.6	5.0
28-Jul	59	3	8	0	11	0	3	0	19	0	15.1	1.0
11-Aug	16	5	16	3	79	16	16	3	13	5	23.3	4.7
25-Aug	33	5	11	3	161	36	5	0	13	0	32.7	6.3
Average	**24.2**	**2.6**	**18.0**	**5.0**	**58.0**	**12.6**	**9.0**	**1.6**	**16.6**	**3.2**	**22.2**	**4.4**
Std. Dev.	22.3	2.5	9.9	6.3	64.0	14.8	5.4	2.3	8.4	4.9	6.8	2.0
Previous Years Averages												
2007 avg	21.8	2.2	5.0	0.0	20.6	1.8	28.0	1.0	62.2	1.8	29.9	4.6
2007 std	12.6	3.5	8.0	0.0	18.3	1.6	11.0	2.2	78.4	1.6	12.2	2.3
2006 avg			0.8	0.0	41.8	3.4					25.8	4.2
2006 std			1.5	0.0	14.9	2.9					9.4	1.1
2005 avg			7.8	1.2	508.4	7.0					211.0	8.3
2005 std			10.0	1.6	1071.0	7.0					374.5	7.5
2004 avg			61.2	0.6	976.9	23.4					493.4	23.5
2004 std			54.4	1.3	1043.9	27.1					530.4	32.0
2003 avg					643.0	46.7					262.1	128.6
2003 std					913.0	74.0					333.3	215.6
2002 avg					187.0	41.7					85.2	8.5
2002 std					56.7	5.1					86.7	14.2
2001 avg					1624.0	812.0					196.1	14.8
2001 std					1239.0	1249.0					445.3	7.4

2.3.8 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Blackstone Lake, 2008

	Station										Average for All Stations	
	1		2		3		4		5			
Date	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
16-Jul	11	0	25	3	5	0	43	11	19	0	20.6	2.8
29-Jul	119	0	59	0	114	0	559	8	1370	8	444.2	3.2
18-Sep	114	0	119	13	98	0	46	0	79	5	91.2	3.6
10-Oct	16	0	16	5	8	0	28	19	33	3	20.2	5.4
Average	**65.0**	**0.0**	**54.8**	**5.3**	**56.3**	**0.0**	**169.0**	**9.5**	**375.3**	**4.0**	**144.1**	**3.8**
Std. Dev.	59.5	0.0	46.7	5.6	57.8	0.0	260.1	7.9	663.7	3.4	202.9	1.1
Previous Years Averages												
2007 avg	92.7	7.3	99.5	15.5	144.3	6.0	258.3	15.3	161.3	22.0	163.5	15.0
2007 std	115.5	7.5	70.0	12.6	84.2	7.7	226.8	20.6	176.0	38.0	137.0	19.1
2006 avg	24.5	0.0	33.5	0.0	86.5	6.5	94.5	12.0	53.0	1.5	58.4	4.0
2006 std	7.8	0.0	7.8	0.0	4.9	9.2	46.0	9.9	32.5	2.1	0.6	0.6
2005 avg	524.0	0.0	1034.8	2.0	852.5	1.5	725.8	0.8	324.5	0.8	692.3	1.0
2005 std	648.3	0.0	1220.6	2.4	1132.9	1.7	846.3	1.5	360.6	1.5	799.8	0.7
2004 avg	19.0	0.0	34.0	4.0	17.5	1.5	26.0	4.0	22.0	6.5	23.7	3.2
2004 std	19.8	0.0	12.7	1.4	2.1	2.1	9.9	5.7	15.6	9.2	1.0	2.3
2003 avg	23.7	2.7	43.0	0.0	18.3	0.0	52.0	2.7	21.7	0.0	31.7	1.1
2003 std	25.4	2.5	51.4	0.0	11.9	0.0	38.3	2.5	25.0	0.0	29.9	0.9
2002 avg	21.7	2.7	43.3	1.0	52.7	3.3	59.0	6.0	38.0	4.7	42.9	3.5
2002 std	23.9	4.6	26.8	1.7	51.6	2.9	41.4	6.6	35.8	2.9	34.2	3.9
2001 avg	18.3	2.3	13.3	3.3	6.8	1.5	42.3	5.3			20.2	3.1
2001 std	18.6	1.5	3.8	3.9	3.5	1.7	28.2	2.1			12.1	1.1

2.3.9 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Crane Lake, 2008

	Station												Average for All Stations	
	1		2		3		4		5		6			
Date	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**
15-Jun	40	3	52	11	49	8	30	3	39	5	22	0	38.7	5.0
29-Jun	28	8	39	0	46	19	36	5	52	8	19	0	36.7	6.7
13-Jul	39	8	22	0	13	0	55	28	36	3	30	11	32.5	8.3
04-Aug	36	0	87	30	36	13	69	19	65	25	90	25	63.8	18.7
18-Aug	110	11	106	0	59	11	102	8	141	72	132	43	108.3	24.2
01-Sep	46	3	79	19	87	16	16	0	49	16	30	5	51.2	9.8
Average	**49.8**	**5.5**	**64.2**	**10.0**	**48.3**	**11.2**	**51.3**	**10.5**	**63.7**	**21.5**	**53.8**	**14.0**	**55.2**	**12.1**
Std. Dev.	30.1	4.1	31.8	12.5	24.6	6.7	31.1	10.8	39.3	26.0	46.4	17.0	28.4	7.6
Previous Years Averages														
2007	134.8	16.3	101.3	19.0	69.6	19.3	111.7	25.2	64.4	25.3	60.2	13.0	90.3	19.7
2006	62.0	8.0	78.0	18.0	187.0	16.0	199.0	16.0	240.0	13.0	407.0	9.0	195.5	13.3
2005	794.7	8.2	913.0	10.3	501.5	9.2	555.3	8.5	584.8	8.0	844.0	6.5	698.9	8.5
2004	1104.7	4.3	1175.1	12.6	1081.3	6.9	1142.1	7.6	1077.3	7.3	1393.3	8.3	1162.3	7.8
2003	631.0	5.7	726.4	9.3	499.3	7.1	505.9	5.1	511.5	5.9	695.8	5.5	595.0	6.4

2.3.10 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Healey Lake, 2008

	Station														Average for All Stations	
	1		2		3		4		5		6		7			
Date	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
21-Jun	11	5	9	3	8	2	4	2	12	4	63	2	15	0	17.4	2.6
19-Jul	10	5	9	0	6	3	19	0	11	3	31	0	8	5	13.4	2.3
30-Aug	12	2	29	4	37	2	16	3	26	2	45	1	21	5	26.6	2.7
Average	**11.0**	**4.0**	**15.7**	**2.3**	**17.0**	**2.3**	**13.0**	**1.7**	**16.3**	**3.0**	**46.3**	**1.0**	**14.7**	**3.3**	**19.1**	**2.5**
Std. Dev.	1.0	1.7	11.5	2.1	17.3	0.6	7.9	1.5	8.4	1.0	16.0	1.0	6.5	2.9	6.7	0.2
2007																
avg	**101.5**	**6.3**	**361.8**	**8.0**	**322.8**	**8.5**	**323.7**	**3.7**	**639.5**	**2.8**	**109.3**	**6.5**	**660.3**	**2.0**	**349.5**	**5.5**
std	99.5	10.6	389.1	5.8	225.1	4.1	169.0	4.0	1190.2	3.8	44.5	4.4	1176.8	4.0	400.7	3.2
2006																
avg	**77.3**	**6.5**	**241.3**	**3.0**	**130.0**	**3.8**	**44.0**	**1.3**	**667.0**	**15.0**	**61.3**	**14.8**	**664.0**	**5.5**	**269.3**	**7.1**
std	52.4	4.4	370.2	0.0	214.2	2.5	53.6	2.5	1172.2	8.9	41.5	15.3	1174.9	4.9	434.7	3.4
2005																
avg	**31.8**	**3.6**	**25.0**	**4.0**	**13.2**	**3.2**	**11.0**	**7.0**	**4.0**	**1.5**	**8.3**	**4.0**	**51.4**	**6.8**	**31.3**	**4.5**
std	42.8	3.5	23.5	1.2	12.5	2.0	17.1	12.1	3.4	1.7	7.5	5.2	74.4	1.6	42.8	3.3
2004																
avg	**402.7**	**8.6**	**89.7**	**3.1**	**31.4**	**2.0**	**737.3**	**3.9**	**47.0**	**1.1**	**38.7**	**2.6**	**85.3**	**4.0**	**204.6**	**3.6**
std	896.1	9.7	115.3	4.6	38.3	3.0	1156.9	4.9	55.1	2.0	46.5	2.5	129.9	4.1	298.6	3.3
2003																
avg	**79.3**	**20.0**	**74.7**	**2.0**	**36.3**	**3.7**	**62.3**	**5.3**	**55.7**	**2.0**	**62.0**	**1.0**	**79.3**	**4.7**	**64.2**	**5.5**
std	30.0	22.9	41.2	1.7	5.8	4.0	43.4	6.8	41.9	1.7	30.6	1.7	59.9	5.7	19.1	5.3
2002																
avg	**158.0**	**6.3**	**94.3**	**4.3**	**230.0**	**5.0**	**39.3**	**6.3**	**17.0**	**2.0**	**55.7**	**1.0**	**42.7**	**1.0**	**91.1**	**3.7**
std	66.4	2.9	11.5	4.0	38.7	0.0	13.7	4.2	6.2	1.7	31.8	1.7	14.8	1.7	19.0	1.5
2001																
avg	**56.5**	**3.5**	**41.5**	**0.0**	**113.0**	**1.3**	**40.8**	**0.8**	**57.8**	**0.8**	**33.8**	**0.8**	**25.3**	**0.0**	**46.1**	**0.9**
std	15.2	3.3	15.9	0.0	107.0	2.5	26.0	1.5	31.7	1.5	33.7	1.5	5.6	0.0	33.5	1.2

2.3.11 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E.Coli (EC) in Kapikog Lake, 2008

	Station																Average all Stations	
	1		2		3		4		5		6		7		8			
Date:	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
7-Jul			8	5	3	3	33	0	0	0					3	0	9.4	1.6
21-Jul	30	0	90	46	62	3	11	3			59	11	22	16	11	3	40.7	11.7
5-Aug	2424	5	2424	3	1370	5	62	5	22	0	2424	3	2424	11	213	0	1420.4	4.0
17-Aug	2424	3	11	0	94	0	16	3	2424	5	1174	11	1696	8	2424	5	1282.9	4.4
3-Sep	2424	3	2424	3	2424	3	177	0	49	0	2424	0	794	3	2424	0	1642.5	1.5
Avg	**1825.5**	**2.8**	**991.4**	**11.4**	**790.6**	**2.8**	**59.8**	**2.2**	**623.8**	**1.3**	**1520.3**	**6.3**	**1234.0**	**9.5**	**1015.0**	**1.6**	**879.2**	**5.4**
std	1197.0	2.1	1308.2	19.4	1077.0	1.8	68.5	2.2	1200.3	2.5	1138.5	5.6	1047.6	5.4	1289.0	2.3	790.3	4.4
2007																		
Avg	**214.2**	**19.0**	**69.8**	**9.5**	**597.6**	**11.6**	**167.0**	**1.0**	**548.4**	**3.2**	**93.8**	**3.8**	**708.5**	**8.8**	**506.0**	**13.8**	**345.2**	**10.2**
std	335.5	29.7	47.6	10.0	1025.6	10.5	350.6	2.2	1051.0	3.4	66.7	2.9	1152.6	6.7	1072.5	14.8	438.0	5.0
2006																		
Avg	**39.6**	**5.8**	**31.4**	**9.2**	**76.0**	**6.2**	**38.8**	**0.0**	**44.8**	**1.2**	**98.4**	**8.2**	**66.2**	**9.0**	**69.0**	**2.2**	**58.0**	**5.2**
std	36.4	2.2	30.6	6.8	54.9	4.8	32.2	0.0	37.6	1.6	89.1	7.4	65.3	5.8	83.4	2.2	44.4	0.4
2005																		
Avg	**354.3**	**8.5**	**53.3**	**4.5**	**629.0**	**2.0**	**56.3**	**7.5**	**58.5**	**4.0**	**32.0**	**3.5**	**20.5**	**2.0**	**55.8**	**6.0**	**157.4**	**4.8**
std	320.7	11.0	48.4	3.3	1196.9	2.4	36.0	5.2	47.3	3.4	22.2	5.2	21.0	2.4	73.5	7.7	209.6	4.4
2004																		
Avg	**67.5**	**1.5**	**38.0**	**4.0**	**60.5**	**1.5**	**37.0**	**4.8**	**20.0**	**0.8**	**44.0**	**6.3**	**96.3**	**2.0**	**297.8**	**1.5**	**82.6**	**2.8**
std	29.0	1.7	41.6	3.4	54.1	1.7	28.9	7.6	26.4	1.5	50.8	3.9	83.6	2.4	382.0	1.7	36.5	1.6
2003																		
Avg	**38.5**	**3.2**	**59.7**	**4.5**	**12.8**	**1.3**	**43.3**	**4.0**	**23.5**	**1.5**	**15.8**	**1.3**	**55.7**	**1.5**	**16.7**	**2.3**	**35.6**	**2.5**
std	29.1	1.8	44.8	5.1	13.2	2.2	32.4	6.2	32.7	1.6	6.6	2.2	29.8	1.6	19.0	2.0	9.1	1.6
2002																		
Avg	**449**	**737**	**764**	**7**	**55**	**3**	**471**	**13**	**410**	**5**	**616**	**9**	**727**	**2**	**446**	**4**	**492**	**6**
std	878.0	5.5	1136.0	7.0	54.0	3.6	865.0	16.3	892.0	6.0	1008.0	9.7	1160.0	3.3	878.0	4.4	883.0	8.2

2.3.12 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Naiscoot Lake, 2008

	Station												Average for All Stations	
	0		1		2		3		4		5			
Date	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
16-Jul	19	11	36	11	39	8	98	3	79	0			54.2	
27-Jul	39	8	69	11	65	13	36	0	65	3			54.8	7.0
17-Aug	33	8	33	0	55	8	59	3	171	11	62	0	68.8	5.0
30-Aug	102	3	33	0	43	3	141	3	469	5	59	0	141.2	2.3
Average	**48.3**	**7.5**	**42.8**	**5.5**	**50.5**	**8.0**	**83.5**	**2.3**	**196.0**	**4.8**	**60.5**	**0.0**	**79.8**	**4.8**
Std. Dev.	36.8	3.3	17.6	6.4	11.8	4.1	46.1	1.5	188.0	4.6	2.1	0.0	41.5	2.3
Previous Years Averages														
2007 avg	32.7	2.7	69.8	2.7	46.8	10.7	54.3	8.0	100.5	57.0	22.0	0.0	62.7	16.0
2007 std	12.2	4.6	35.8	2.5	25.5	2.5	20.7	9.8	57.5	98.7			26.3	23.3

Figure 2.4.11 Area Comparison of Bacteria Data

Sans Souci			Pointe au Baril Island Area			South Channel Area		
	Average for All Stations			Average for All Stations			Average for All Stations	
Date	TC	EC	Date	TC	EC	Date	TC	EC
*08-Jun	66.7	29.0	30-Jun	17.4	5.2	1-Jun	67.4	7.1
**22-Jun	39.0	2.4	14-Jul	22.6	5.2	15-Jun	131.4	7.2
06-Jul	14.9	0.0	28-Jul	15.1	1.0	6-Jul	77.8	3.8
19-Jul	43.7	3.4	11-Aug	23.3	4.7	10-Aug	160.5	16.5
03-Aug	120.1	1.1	25-Aug	32.7	6.3	6-Sep	129.8	10.3
**17-Aug	372.1	16.0						
31-Aug	65.4	0.4						
*14-Sep	64.3	1.7						
Average	**98.3**	**6.8**		**22.2**	**4.5**		**108.2**	**9.1**
Std. Dev.	**114.7**	**10.4**		**6.8**	**2.0**		37.4	4.3

Blackstone Lake			Crane Lake			Healey Lake			Kapikog Lake			Naiscoot Lake		
	Average for All Stations			Average for All Stations			Average for All Stations			Average for All Stations			Average for All Stations	
Date	TC	EC	Date	TC	EC	Date	TC	EC	Date	TC	EC	Date	TC	EC
16-Jul	20.6	2.8	15-Jun	38.7	5.0	21-Jun	17.4	2.6	7-Jul	9.4	1.6	16-Jul	54.2	
29-Jul	444.2	3.2	29-Jun	36.7	6.7	19-Jul	13.4	2.3	21-Jul	40.7	11.7	27-Jul	54.8	7.0
18-Sep	91.2	3.6	13-Jul	32.5	8.3	30-Aug	26.6	2.7	5-Aug	1420.4	4.0	17-Aug	68.8	5.0
10-Oct	20.2	5.4	04-Aug	63.8	18.7				17-Aug	1282.9	4.4	30-Aug	141.2	2.3
			18-Aug	108.0	24.2				3-Sep	1642.5	1.5			
			01-Sep	51.2	9.8									
Average	**144.1**	**3.8**		**55.2**	**12.1**		**19.1**	**2.5**		**879.2**	**5.4**		**79.8**	**4.8**
Std. Dev.	**202.9**	**1.1**		**28.3**	**7.6**		6.7	0.2		790.3	4.4		**41.5**	**2.4**

Skerryvore Area			Sturgeon Bay			Woods Bay		
	Average for All Stations			Average for All Stations			Average for All Stations	
Date	TC	EC	Date	TC	EC	Date	TC	EC
14-Jun	242.5	4.2	14-Jun	65.6	13.7	21-Jun		
03-Jul	129.3	20.7	22-Jul	108.7	2.5	15-Jul	43.5	9.5
17-Jul	55.3	2.8	13-Aug	65.4	6.3	31-Jul	125.2	14.0
07-Aug	200.3	24.3	26-Sep	48.6	2.1	19-Aug	144.7	25.2
28-Aug	109.2	4.8				04-Sep	113.7	12.2
11-Sep	199.5	10.8						
Average	**156.0**	**11.3**		**72.1**	**6.2**		**106.8**	**15.2**
Std. Dev.	**69.8**	**9.2**		**25.7**	**5.4**		44.1	6.9