

2009 ST. MARYS RIVER-SUGAR ISLAND MONITORING:

A FINAL REPORT OF THE SUGAR ISLAND

MONITORING WORK GROUP

JUNE 2010

TABLE OF CONTENTS

	Page
TITLE PAGE.....	1
TABLE OF CONTENTS.....	2
EXECUTIVE SUMMARY.....	3
SECTION 1: INTRODUCTION.....	4
SECTION 2: METHODS.....	6
SECTION 3: INCIDENT REPORTS.....	8
SECTION 4: WEEKLY MONITORING REPORTS.....	11
SECTION 5: PUBLIC OUTREACH.....	13
SECTION 6: CONCLUSIONS.....	14
SECTION 7: NEXT STEPS.....	16
SECTION 8: ACKNOWLEDGEMENTS.....	17
SECTION 9: LITERATURE CITED.....	18

APPENDIX A: DATA RESULTS

Executive Summary

The Sugar Island Monitoring Workgroup (SIMWG) was established in February 2007 in response to reports of floating solids with high *Escherichia coli* (*E. coli*) levels periodically found in the Lake George channel of the St. Marys River. The multi-agency, bi-national workgroup was tasked by the Four Party Management Committee (consisting of representatives from the U.S. Environmental Protection Agency, Environment Canada, Michigan Department of Environmental Quality, and Ontario Ministry of the Environment) to develop and implement a monitoring plan to determine the source and nature of the floating materials and the cause(s) responsible for the periodic high levels of *E. coli* at the Sugar Island Township Park beach. In response to recommendations from the report summarizing the 2008 results, the SIMWG scaled down its monitoring plan for 2009.

The monitoring plan consisted of a surveillance program involving a coordinated response to any reports of floating materials in the river, and weekly water monitoring of seven stations along the north shore of Sugar Island for *E. coli* by the Chippewa County Health Department (CCHD). Weekly sampling was conducted from 6/24/2009 to 9/21/2009 according to the protocols set forth in the Quality Assurance Project Plan developed in 2007 and updated in 2008.

There were four incidents of floating material reported during the 2009 season; two in April, one in August, and one in September. Samples were collected for all four incidents. The first sample, a white foamy substance, could not be identified but likely was a natural event. The second incident appeared to be algae, and quickly disappeared. The August and September incidents were more of a concern, as both consisted primarily of garbage debris and various hygiene products. Contingency monitoring conducted soon after the September incident did not find additional floating material, high *E. coli* levels, or any indication of overflows/bypasses from nearby wastewater treatment plants. These incidents likely were the result of washout from storm sewers or release from recreational boats.

A total of 98 weekly samples were collected by CCHD from seven locations on the north shore of Sugar Island. Only six of these samples exceeded the Michigan Water Quality Standard of 300 cfu/100 mL, four of which occurred in mid- to late-September after the heavy recreation season. Only 23 samples exceeded 100 cfu/100 mL. Five additional follow-up sampling episodes were conducted after heavy rain or high values found during the weekly sampling. *E. coli* levels during the episodic sampling generally were low.

A public meeting was held on Sugar Island in June 2009, during which the SIMWG presented the 2008 monitoring results and sampling plans for 2009.

Section 1: Introduction

Background

The St. Marys River starts as the outlet of Lake Superior at Whitefish Bay and flows southeasterly through several channels to Lake Huron, a distance of 100-120 kilometers (depending on the route). The average flow volume is 2,144 cubic meters per second. Several islands were formed when the river divided into its numerous channels. Sugar Island is the largest upstream island, which separates Lake George (east) and Lake Nicolet (west). The watershed includes all of the Lake Superior drainage basin as well as a number of small tributaries which drain directly into the river. Michigan tributaries include the Waishkey, Charlotte, Little Munuscong, Munuscong, and Gogomain Rivers as well as other small streams. In Ontario, the main tributaries are the Big Carp, Little Carp, Root, Garden, Echo, and Bar Rivers, as well as East Davignon Creek, West Davignon Creek, and Fort Creek. The St. Marys River was identified in 1985 by the International Joint Commission as one of 43 Areas of Concern (AOC) in the Great Lakes basin. Details about the area and its designation as an AOC are provided in the 2007 report (SIMWG 2008).

A great deal of monitoring in the St. Marys River has occurred over the last 20 years, primarily in response to its designation as an AOC. These data collection efforts are described in the 1992 and 2002 RAP documents (Ontario Ministry of the Environment and Michigan Department of Natural Resources, 1992; Environment Canada et al. 2002). Since 2001, the Chippewa County Health Department (CCHD) has conducted *Escherichia coli* (*E. coli*) monitoring at three beaches along the St. Marys River (Four Mile Beach, Sherman Park Beach, and Sugar Island Township Park Beach). During summer 2006, residents along the north shore of Sugar Island reported numerous episodes of contaminants, floatable materials, and other indicators suggestive of sewage. These complaints were accompanied by photographs and water samples. In response, water quality agencies in Canada and the U.S. conducted extensive monitoring to characterize the severity of water quality impairment and to identify potential sources of bacteria and floating solids.

Comprehensive descriptions of sampling activities in 2006, 2007, and 2008 by Canadian and U.S. agencies, along with resulting data summaries and discussion, have been provided in previous reports (Michigan Department of Environmental Quality 2007, SIMWG 2008, 2009).

Description of 2009 Monitoring

The SIMWG was formed in 2007 to develop a comprehensive, coordinated monitoring plan for the St. Marys River/Sugar Island. The SIMWG consists of representatives from local, tribal, provincial, state, and federal agencies in Canada and the U.S. Specifically, these include Algoma Public Health (APH); CCHD; Ontario Ministry of Environment (MOE); Michigan Department of Environmental Quality, now the Department of Natural

Resources and Environment (DNRE); Environment Canada (EC); Health Canada; U.S. Environmental Protection Agency (EPA); Bay Mills Indian Community; and Sault Ste. Marie Tribe of Chippewa Indians (Sault Tribe).

The SIMWG was charged with the following tasks:

1. Review previous water and sediment monitoring data, as well as various agency monitoring activities;
2. Identify data gaps and future monitoring needs;
3. Update/enhance the Sugar Island Incidence Response Protocol; and
4. Develop an interagency monitoring plan that incorporates ambient and event-response monitoring activities.

After extensive sampling in 2006, 2007, and 2008, the SIMWG conducted more limited monitoring in 2009. The effort addressed the following objectives:

- a) Determine the nature of any solid floatable material reported in the St. Marys River near Sugar Island.
- b) Assess current water quality conditions and standards attainment status along the north shore of Sugar Island.
- c) Identify authorized/unauthorized point source or non-point source discharges, as well as any other potential ecological sources or processes that could potentially impair water quality conditions and/or be responsible for beach closures/health advisories along Sugar Island.

A Quality Assurance Project Plan (QAPP), which describes the sampling and analytical protocols used by the SIMWG, was jointly prepared by the agencies in 2007 and updated in 2008. The weekly sample collection and analysis procedures used by the CCHD in 2009 were consistent with the QAPP. The QAPP was included as an Appendix in the previous reports.

Section 2: Methods

Sampling Area

The 2009 monitoring effort focused on the Lake George Channel of the St. Marys River. Seven stations were monitored in 2009 (Figure 1; Table 1), all of them along the Sugar Island north shore.



Figure 1: Locations of weekly sampling

Table 1: Locations of weekly sampling

Site Location	Site Address	GPS Coordinates		Datum
		<i>Latitude</i>	<i>Longitude</i>	
Site 1 = Bumstead	55 N. Westshore Dr.	46.30.443	-84.14.561	NAD 83
Site 2 = Harrington	89 n. Westshore Dr.	46.30.469	-84.14.559	NAD 83
Site 3 = Eitrem COVE	182 N. Westshore Dr.	46.30.534	-84.14.569	NAD 83
Site 4 = Eitrem EAST	182 N. Westshore Dr.	46.30.588	-84.14.600	NAD 83
Site 5 = Smith	6100 E. Pt. Lewis Lane	46.30.922	-84.14.311	NAD 83
Site 6 = Sugar Island Township Park	1175 N. Westshore Dr.	46.31.413	-84.13.675	NAD 83
Site 7 = Welch	2023 N. Williams Dr.	46.32.143	-84.12.429	NAD 83

Sample Collection

Weekly sampling was conducted by the CCHD from 6/24/2009 through 9/21/2009. Samples generally were collected on Wednesday of each week, sometimes during or soon after rain events. Three water samples (replicates) were collected at each beach/near-shore location in sterilized bottles and preserved with sodium thiosulfate. Samples were immediately placed in a cooler with ice for delivery to the laboratory within six hours of collection.

Area residents and others frequently on the river served as volunteers to alert the local health departments when excessive floating material was observed. Where possible (i.e., when the floating solids were still present when an agency responded), samples were collected by the CCHD and/or by the residents and provided to the DNRE and/or EC for identification.

Sample Analysis

All samples were analyzed using approved methods and according to standard protocols. Water samples collected by the CCHD were analyzed for *E. coli* by Lake Superior State University (LSSU) using Colilert 18, an EPA approved method.

Floatable samples collected in response to reports from area residents were analyzed by DNRE and/or EC under a microscope, and results were reported to the work group.

Analytical procedure details are available in the previous reports. LSSU's laboratory followed Quality Assurance (QA)/Quality Control (QC) procedures during the study.

Data Management

Analytical results were transmitted from the laboratory to the CCHD as individual measurements. Results were consolidated into an Excel spreadsheet. The SIMWG was notified by CCHD when elevated *E. coli* levels (i.e., > 300 cfu/100 mL) were measured.

Section 3: Incident Reports

One component of the 2009 monitoring work plan was the reporting of any unusual floating material observations by Sugar Island residents, agencies, organizations frequently on the St. Marys River (e.g., Ontario Provincial Police, U.S. Coast Guard), and the general public. Observers were encouraged to immediately report such incidents to the local jurisdictions (i.e., CCHD or APH). An Incident Response Protocol, first developed in 2006 and updated each year, was followed to quickly notify all agencies on the SIMWG, take photographs and collect samples if possible. Samples were sent to DNRE and/or EC for analysis when available.

There were four incidents reported to the SIMWG during 2009. Two reports were received in April, one in August and one report in September. A summary of these incidents and associated findings are presented below.

Samples were taken for all four incidents, three of which were tested for *E. coli*. All three had low *E. coli* counts. The incident reported on 9/28/2009 initiated contingency monitoring.

Table 2: Incidents of floating material in the St. Marys River 2009.

Date	Action taken	Samples collected by	Receiving Agency	Observations	Results	Conclusions
15-Apr-09	samples collected	Morley	LSSU	White foamy substance	<i>E. coli</i> <1 cfu/100 mL	Not identified
23-Apr-09	Samples collected	SI resident	CCHD	Green, oily slick substance	Could not be tested	Appeared to be algae, not conclusive, did not reappear
25-Aug-09	Samples taken	CCHD	LSSU	various floating material, tampon applicator, syringe	visual identification, <i>E. coli</i> 130.6 cfu/100mL	Dumping or washout from storm sewer outfall
28-Sep-09	-initial Samples taken -Contingency monitoring activated	-Welch -CCHD -OMOE	LSSU, OMOE, EC	various floating material, tampon applicator, syringe, oily slick	Contingency monitoring results reported in Table 3	Dumping or washout from storm sewer outfall

Perhaps the most significant incident was reported on 9/28/2009. The initial report was made to CCHD by Sugar Island resident Wayne Welch. Mr. Welch reported floating debris at five separate locations (Incident Report 4). Samples collected by Mr. Welch were photographed and given to CCHD, which conducted a follow-up inspection and noted debris on the shore at Eitrem Cove and at the Sugar Island Township Park. Debris

included but was not limited to plastic floss picks, tampon applicators and used band aids, candy wrappers, and tampon wrappers. CCHD also collected routine samples on September 28. *E. coli* levels reported for these samples ranged from 32.5 cfu/100mL at the Smith location to 387 cfu/100mL at the Eitrem Cove locations.

Contingency monitoring was conducted in response to this incident. Randy Conroy (DNRE) investigated the operation of the Michigan Waste Water Treatment Plant on 9/28/2009. Pat Lightfoot (City of Sault Ste. Marie, MI) confirmed that the flows of 3.6 and 6.2 Million Gallons per Day (MGD) for the day were well under the secondary treatment capacity of 9 MGD and stated there were no solid releases to the river during the time frame. Rod Stewart (MOE) investigated the operation of the Ontario East End Sewage Treatment Plant (EESTP). Don Elliott (City of Sault Ste. Marie, ON) confirmed that there were no operational problems, bypasses, or overflows at the plant or the upstream system. Maximum flows for the time period at the EESTP were 40.27 Million Litres per Day (MLD) and 62.96 MLD. Bypasses may occur if the flow exceeds 73 MLD.

Randy Conroy conducted a St. Marys River inspection on 9/30/2009. The investigation was conducted aboard a U.S. Coast Guard vessel and observations were made along the entire stretch of the North Channel. No solid debris was observed during the visual river assessment. Pictures were taken at some locations.

Lilian Keene (MOE) collected transect water samples from an EC research vessel on 9/30/2009. Five samples across the river at three locations down the river were taken for *E. coli* and Bacteriodes DNA-typing samples. *E. coli* results ranged from <10 – 50 cfu/100 mL (Table 3). As a result of these low levels, Bacteriodes analysis was not conducted.

Table 3: *E. coli* results from contingency monitoring on September 30, 2009.

Sample Date (dd/mm/yy)	Sample ID	Sample Description	Longitudes (decimal degrees)	Latitudes (decimal degrees)	Datum	E.coli (cfu/100ml)
9/30/2009	DEE20090930T1	Downstream East End WWTP (Old Discharge)	84.25008	46.50341	NAD 83	<10
9/30/2009	DEE20090930T2	Downstream East End WWTP (Old Discharge)	84.25081	46.50367	NAD 83	10
9/30/2009	DEE20090930T3	Downstream East End WWTP (Old Discharge)	84.25206	46.50423	NAD 83	10
9/30/2009	DEE20090930T4	Downstream East End WWTP (Old Discharge)	84.25320	46.50495	NAD 83	10
9/30/2009	DEE20090930T5	Downstream East End WWTP (Old Discharge)	84.25435	46.50582	NAD 83	50
9/30/2009	DES20090930T1	Downstream Edison Sault Electric	84.32547	46.49599	NAD 83	10
9/30/2009	DES20090930T2	Downstream Edison Sault Electric	84.32381	46.49786	NAD 83	10
9/30/2009	DES20090930T3	Downstream Edison Sault Electric	84.32291	46.49963	NAD 83	<10
9/30/2009	DES20090930T4	Downstream Edison Sault	84.32147	46.50134	NAD	40

9/30/2009	DES20090930T5	Electric Downstream Edison Sault Electric	84.32156	46.50267	83 NAD 83	10
9/30/2009	SIP20090930T1	Sugar Island Township Park	84.23184	46.52481	83 NAD	<10
9/30/2009	SIP20090930T2	Sugar Island Township Park	84.23278	46.52452	83 NAD	<10
9/30/2009	SIP20090930T3	Sugar Island Township Park	84.23444	46.52552	83 NAD	10
9/30/2009	SIP20090930T4	Sugar Island Township Park	84.23581	46.52580	83 NAD	<10
9/30/2009	SIP20090930T5	Sugar Island Township Park	84.23761	46.52620	83	<10

The results of the investigations and contingency monitoring indicated that:

- a) There was no evidence that the floating debris originated from the WWTPs or their systems.
- b) *E. coli* levels were not overly elevated on 9/28/2009 at the routine sites sampled by CCHD.
- c) There was no evidence of floating debris on the river on 9/30/2009.
- d) Levels of *E. coli* in the St. Marys River were low on 9/30/2009.

Section 4: Weekly Monitoring Results

E. coli levels during the 2009 field season generally were low, with 80% of the weekly samples below 100 cfu/100 mL. CCHD sampled seven routine sites from 6/24/2009 to 9/21/2009 for a total of 98 samples (appendix A). Of the 98 weekly samples taken by CCHD, only 6 (6%) exceeded the Michigan Water Quality Standard (WQS) of 300 cfu/100 mL (Figure 2, Table 4). It should be noted that almost half of the elevated (> 100cfu/100mL) samples and five of the exceedances occurred over two weeks in September.

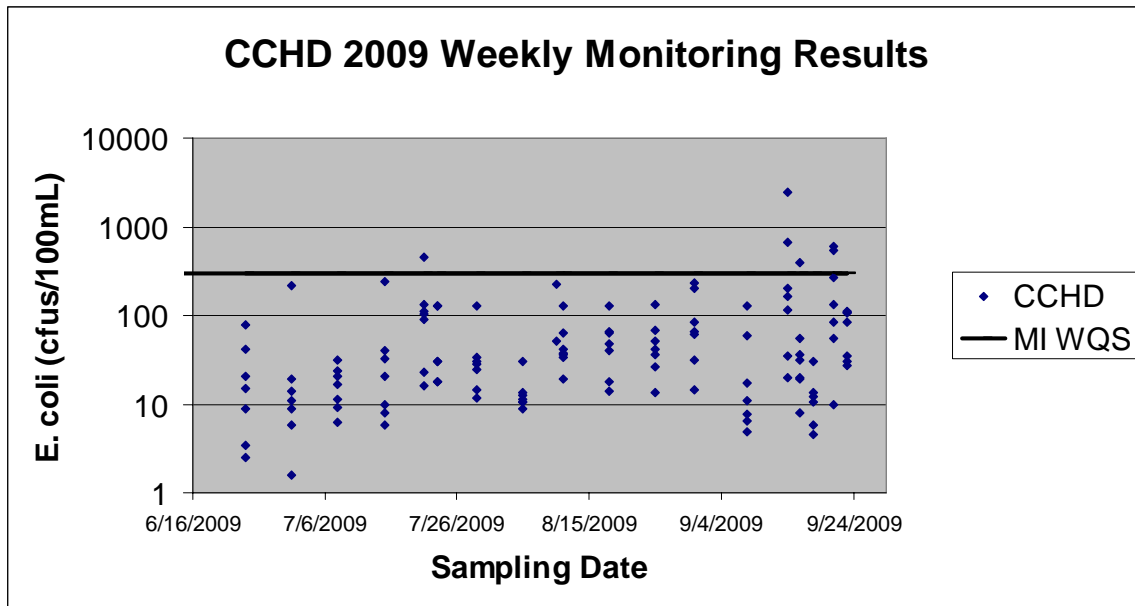


Figure 2. Weekly monitoring results in 2009.

In addition to the routine samples, 30 samples were collected during five sampling episodes after high levels were found in routine weekly samples or when CCHD had concerns. Follow-up sampling occurred on five occasions. These additional follow-up samples were taken from several locations on 7/21/09, 9/14/09, 9/16/09, and 9/21/09 to determine the extent of water quality impairment. CCHD also sampled after heavy rains and bypasses at the sewage treatment facilities (Ontario and Michigan) on 8/10/09. For each date, the follow up samples were usually very low with only one exceedance requiring additional sampling.

Elevated samples were most common at Site 5. Exceedances were distributed across the sites (Table 4).

Table 4. Spatial distribution of exceedances and elevated samples in 2009.

	Elevated (>100 cfu/100 mL <300 cfu/100 mL)	Exceedances (>300 cfu/100 mL)
Site 1 = Bumstead	2	1
Site 2 = Harrington	2	0
Site 3 = Eitrem COVE	3	2
Site 4 = Eitrem EAST	3	1
Site 5 = Smith	9	1
Site 6 = Sugar Island Township Park	3	1
Site 7 = Welch	1	0

Section 5: Public Outreach

Public Meeting

A public meeting was held on the evening of 6/9/2009, at the Sugar Island Township Hall on Sugar Island, MI. The purpose of the meeting was to provide information to the public on the results from the 2008 sampling program on the north shore of Sugar Island and in the Lake George Channel. The meeting also provided an opportunity to discuss the planned 2009 monitoring and event response procedures.

In consultation with the SIMWG, a letter of invitation, press release, and agenda for the meeting were prepared. Press releases were issued by the Canadian and U.S. local health agencies, and the DNRE. Copies of the 2008 SIMWG report were also made available to interested parties. A SIMWG display was also created for the meeting to highlight the purpose of the coordinated monitoring effort, including a map indicating proposed sampling sites for 2009.

Representatives of the SIMWG made short presentations and answered questions related to the 2008 water quality monitoring results and their agencies role in the 2009 coordinated monitoring activities.

Approximately 50 people were in attendance encompassing the following organizations:

- Elected officials and/or representatives
- Tribes/First Nations
- Federal and Provincial/State government agencies
- Local government agencies (including local health departments)
- Universities
- Environmental non-government organizations
- Local residents
- Media

Bi-National Public Advisory Council (BPAC) Updates

The St. Marys River BPAC was kept informed of the SIMWG activities through the Four Agency Update documents prepared for 2009 BPAC meetings on 5/21/2009, 7/8/2009, 9/17/2009, and 10/21/2009. In addition, the Canadian co-chair of the SIMWG (Debbie Burniston) gave a presentation summarizing most of the 2009 results at the September BPAC meeting.

Section 6: Conclusions

Process

- The SIMWG, which included several local, tribal, state, provincial, and federal agencies, worked together effectively to develop a comprehensive, cooperative monitoring plan for the 2007 field season. In 2008, the monitoring plan was expanded to include Bacteriodes samples to accommodate source tracking sampling, if required. The 2009 monitoring plan was scaled back to monitor U.S. sites only, with contingency monitoring to be conducted if needed.
- Frequent communication among the agencies was maintained during the 2009 field season by conference calls scheduled when necessary, generally monthly. Cooperation and communication among the agencies were excellent.

Incident Reports

- Only four incident reports from area residents were received in 2009, two in April, one in August, and one in September.
- All incidents were quickly investigated according to the Incident Response Protocol. There were no exceedances of *E. coli* associated with any of the events. Two of the incidents did not get identified while the last two were not natural material but debris/garbage likely either dumped or washed into the river via storm sewer outfalls or recreational boats. There was no evidence of sewage during these events and no associated high *E. coli* values.
- Samples collected during the contingency sampling after the September 28 incident had low levels of *E. coli*.
- The Incident Response Protocol jointly developed the CCHD, APH, MOE, and DNRE, generally worked well in facilitating inter-agency communication. Contingency monitoring was activated quickly and ensured public safety.

Weekly Sampling

- Overall, *E. coli* levels were low during the 2009 sampling season. Of 98 samples collected, only 23 had *E. coli* levels greater than 100 cfu/100 mL. Of these samples, six had *E. coli* levels greater than the Michigan WQS of 300 cfu/100 mL.
- There were no apparent trends either spatially or temporally for the CCHD samples over the 2007, 2008 and 2009 seasons. *E. coli* levels were relatively low with both elevated levels and levels exceeding the Michigan Water Quality Standard dispersed fairly evenly throughout the area.

Table 5. Samples collected by CCHD.

Total Samples	2007 84		2008 103		2009 98	
	Elevated	Exceedance	Elevated	Exceedance	Elevated	Exceedance
Site 1 = Bumstead	1	1	1		2	1
Site 2 = Harrington	1		2		2	
Site 3 = Eitrem COVE	2	1	1		3	2
Site 4 = Eitrem EAST	1				3	1
Site 5 = Smith	2			1	9	1
Site 6 = Sugar Island Township Park	2		2		3	1
Site 7 = Welch	1				1	
% of Total	12	2.4	6	1	23	6

Section 7: Next Steps

1. The MDNRE, MOE, CCHD, and Algoma Public Health will continue to follow the Incident Response Protocol in 2010, as in previous years. If reports of floating materials are received from area residents, samples will be collected and identified if feasible.
2. Although the individual agencies may continue with monitoring and other activities through existing programs, the formal SIMWG will be disbanded. The original charge and objectives of the work group have been achieved.
3. The SIMWG co-chairs, Debbie Burniston (EC) and Gary Kohlhepp (DNRE), will act in an advisory capacity as needed to the local agencies participating in the Incident Response Protocol. For example, they could receive samples of unknown substances for identification on behalf of their respective agencies.

Section 8: Acknowledgements

Members of the SIMWG would like to acknowledge and thank the following people/agencies for their work on this program:

The Sugar Island Township Board for hosting the 2009 SIMWG public meeting at the Township Hall

The Sugar Island residents for attending the 2009 SIMWG public meeting and continuing to report unusual incidents of floating material.

Jason Hamilton (MOE) and Michelle Selzer (DNRE) for their work in organizing the 2009 SIMWG public meeting

The DNRE for providing a Clean Michigan Initiative grant to CCHD to monitor the sites along the north shore of Sugar Island.

Section 9: Literature Cited

Environment Canada, United States Environmental Protection Agency, Ontario Ministry of the Environment, and the Michigan Department of Environmental Quality. 2002. St. Marys River Remedial Action Plan Stage 2 Report: Remedial Strategies for Ecosystem Restoration. December 2002.

Michigan Department of Environmental Quality. 2007. St. Marys River *E. coli* Data Compilation and Summary. MI/DEQ/WB-07/040.

Ontario Ministry of the Environment and the Michigan Department of Natural Resources. 1992. St. Marys River Remedial Action Plan Stage 1: Environmental Conditions and Problem Definitions. March 1992.

Sugar Island Monitoring Workgroup. 2008. 2007 St. Marys River – Sugar Island Monitoring: A Final Report of the Sugar Island Monitoring Work Group. April 2008.

Sugar Island Monitoring Workgroup. 2009. 2008 St. Marys River – Sugar Island Monitoring: A Final Report of the Sugar Island Monitoring Work Group. March 2009.

Appendix A

Data Results 2009

Chippewa County Health Department					
St. Marys River <i>E.coli</i> Data for June 6, 2007 - October 31, 2007					
<i>Shoreline samples collected approximately 30-50 ft out from center of residential shoreline. ALL SAMPLE RESULTS ARE GEOMETRIC MEAN OF 3 SAMPLES COLLECTED PER LOCATION.</i>					
Site Location	Site Address	GPS Coordinants			
		Latitude	Longitude		
Site 1 = Bumstead	Dr.	46.30.443	-84.14.561		
Site 2 = Harrington	Dr.	46.30.469	-84.14.559		
Site 3 = Eitrem COVE	Westshore Dr.	46.30.534	-84.14.569		
Site 4 = Eitrem EAST	Westshore Dr.	46.30.588	-84.14.600		
Site 5 = Smith	Lewis Lane	46.30.922	-84.14.311		
Site 6 = Sugar Island Township Park	1175 N. Westshore Dr.	46.31.413	-84.13.675		
Site 7 = Welch	Williams Dr.	46.32.143	-84.12.429		
INCIDENCE RESPONSE					
SAMPLE COLLECTION POINT	DATE COLLECTED	INDICATOR (CFU/100ML)		Weather	Field Observations
		COLIFORM	E. COLI		
Welch	8/10/2009	1829.9	50.6		
North Channel	8/10/2009	962.1	56.5		
Sugar Island Twsp. Park	8/10/2009	>2419.6	228		
Morley	8/10/2009	1030.1	51.8		
Response to high E. coli counts from 7/21/09 on Eitrem Property					
Smith	7/23/2009	496.8	126.3	Cloudy	
Eitrem Cove	7/23/2009	299.8	30.2	Cloudy/rain	
Eitrem East	7/23/2009	788.3	18.1	cloudy/rainy	
N. channel Dwnrvr of Pipe	7/23/2009	242.6	8.1	Cloudy	
N. channel uprvr of Pipe	7/23/2009	301.9	14	Cloudy	
100 yard out from Eitrem	7/23/2009	79.6	13.6	Cloudy	
Response to the High E. coli counts on 9/14/09 on the Eitrem and Bumstead Property					
Smith	9/16/2009	801.8	387.4	Sunny	
Eitrem East	9/16/2009	484.1	20.1	Sunny	
Eitrem Cove	9/16/2009	460.5	55.2	Sunny	
Sugar Island Twsp. Park	9/16/2009	242.8	8	Sunny	
Harrington	9/16/2009	995.3	35.6	Sunny	
Welch	9/16/2009	323	19.4	Sunny	
Bumstead	9/16/2009	392.1	31.5	Sunny	
Response to the High counts on 9/16/09 on Smith Property					
Smith	9/18/2009	345.9	13.4	Sunny	
Harrington	9/18/2009	261.4	4.5	Sunny	
Eitrem East	9/18/2009	159	5.9	Sunny	
Eitrem Cove	9/18/2009	402.7	30.5	Sunny	
Bumstead	9/18/2009	190.1	12.2	Sunny	
Sugar Island Twsp. Park	9/18/2009	291.2	10.5	Sunny	

Response to the High E.coli counts from 9/21/09 on Sugar Island Twsp. Park and the Eitrem property					
Smith	9/23/2009	497.4	111.4	Sunny, Windy	
Harrington	9/23/2009	1047.3	108.6	Sunny	
Eitrem Cove	9/23/2009	981.2	84.2	Sunny	
Eitrem East	9/23/2009	376.9	27	Sunny, Windy	
Welch	9/23/2009	628.8	34.3	Sunny	
Sugar Island Twsp. Park	9/23/2009	1399.9	30.7	Sunny	
Bumstead	9/23/2009	804.5	107.6	Sunny	
WEEKLY SAMPLING					
	DATE COLLECTED	INDICATOR (CFU/100ML)	Weather	Field Observations	
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	6/24/2009	764.1	41.4	Sunny	
Site 2 = Harrington	6/24/2009	953.6	77.4	Sunny	
Site 3 = Eitrem COVE	6/24/2009	74	8.9	Sunny	Higher Water Level then the Year Before
Site 4 = Eitrem EAST	6/24/2009	297	2.5	Sunny	
Site 5 = Smith	6/24/2009	118.4	20.5	Sunny	New Bridge put in
Site 6 = Sugar Island Township Park	6/24/2009	193.7	3.4	Sunny	
Site 7 = Welch	6/24/2009	756.2	14.8	Sunny	
	DATE COLLECTED	INDICATOR (CFU/100ML)	Weather	Field Observations	
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	7/1/2009	323.8	14.4	cloudy	
Site 2 = Harrington	7/1/2009	546.9	14.2	cloudy	Goose Feces
Site 3 = Eitrem COVE	7/1/2009	14.24	10.8	cloudy	
Site 4 = Eitrem EAST	7/1/2009	1029.4	220.1	cloudy	
Site 5 = Smith	7/1/2009	218	19	cloudy	Goose Feces
Site 6 = Sugar Island Township Park	7/1/2009	138.6	8.9	cloudy	
Site 7 = Welch	7/1/2009	55.1	1.6	N/A	
North Channel	DATE COLLECTED	INDICATOR (CFU/100ML)	Weather	Field Observations	
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	7/8/2009	262	23.5	Sunny	
Site 2 = Harrington	7/8/2009	193.2	6.3	Sunny	
Site 3 = Eitrem COVE	7/8/2009	189.2	11.2	Sunny	
Site 4 = Eitrem EAST	7/8/2009	270.4	20.2	Sunny	
Site 5 = Smith	7/8/2009	185.6	16.5	Sunny	
Site 6 = Sugar Island Township Park	7/8/2009	291	9	Sunny	
Site 7 = Welch	7/8/2009	262.7	31.2		
	DATE COLLECTED	INDICATOR (CFU/100ML)	Weather	Field Observations	
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	7/15/2009	442.9	7.9	Rainy	
Site 2 = Harrington	7/15/2009	334.4	5.7	Rainy	
Site 3 = Eitrem COVE	7/15/2009	1308.9	9.9	Rainy	
Site 4 = Eitrem EAST	7/15/2009	714.5	32.4	Rainy	
Site 5 = Smith	7/15/2009	1296.8	240	Rainy	
Site 6 = Sugar Island Township Park	7/15/2009	438	20.7	Rainy	
Site 7 = Welch	7/15/2009	506.7	40.7	Rainy	

	DATE COLLECTED	INDICATOR (CFU/100ML)		Weather	Field Observations
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	7/21/2009	963.2	102.8	Sunnu	
Site 2 = Harrington	7/21/2009	699.9	90.1	Sunnu	
Site 3 = Eitrem COVE	7/21/2009	351.1	16.2	Sunnu	
Site 4 = Eitrem EAST	7/21/2009	1498.2	460.8	Sunnu	Floating debris
Site 5 = Smith	7/21/2009	701.3	132.7	Sunnu	
Site 6 = Sugar Island Township Park	7/21/2009	391.9	111.2	Sunnu	
Site 7 = Welch	7/21/2009	213	23	Sunnu	Weed/bug debris on top of the water
N. channel dwnrvr of Pipe	7/21/2009	71.4	7.7	Sunny	
N. channel uprvr of Pipe	7/21/2009	142.3	13	Sunny	
Smith	7/23/2009	496.8	126.3	Cloudy	
Eitrem Cove	7/23/2009	299.8	30.2	Cloudy/rain	
Eitrem East	7/23/2009	788.3	18.1	cloudy/rainy	
N. channel Dwnrvr of Pipe	7/23/2009	242.6	8.1	Cloudy	
N. channel uprvr of Pipe	7/23/2009	301.9	14	Cloudy	
100 yds. Out from Eitrem Property	7/23/2009	79.6	13.6	Cloudy	
	DATE COLLECTED	INDICATOR (CFU/100ML)		Weather	Field Observations
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	7/29/2009	268.6	11.9	cloudy	
Site 2 = Harrington	7/29/2009	346.5	33.7	Sunny	
Site 3 = Eitrem COVE	7/29/2009	1096.2	24.1	Sunny	
Site 4 = Eitrem EAST	7/29/2009	430.9	14.7	Sunny	
Site 5 = Smith	7/29/2009	578.8	126.6	cloudy	
Site 6 = Sugar Island Township Park	7/29/2009	365.8	28.3	cloudy/windy	
Site 7 = Welch	7/29/2009	903.3	30.5	Sunny	
	DATE COLLECTED	INDICATOR (CFU/100ML)		Weather	Field Observations
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	8/5/2009	438.3	10.4	Sunny	
Site 2 = Harrington	8/5/2009	373.7	11.5	sunny	
Site 3 = Eitrem COVE	8/5/2009	167.6	10.4	Sunny	
Site 4 = Eitrem EAST	8/5/2009	385.2	8.7	Sunny	
Site 5 = Smith	8/5/2009	130.4	12.5	Sunny	
Site 6 = Sugar Island Township Park	8/5/2009	452.7	30	sunny	
Site 7 = Welch	8/5/2009	637.9	13.7	sunny	
	DATE COLLECTED	INDICATOR (CFU/100ML)		Weather	Field Observations
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	8/11/2009	1539.6	63.3	Cloudy	
Site 2 = Harrington	8/11/2009	1512.9	41.9	Cloudy	
Site 3 = Eitrem COVE	8/11/2009	1954.3	127.4	Cloudy	
Site 4 = Eitrem EAST	8/11/2009	>2419.6	35.6	Cloudy	Thick film on top of the water
Site 5 = Smith	8/11/2009	568.5	19.2	Cloudy	
Site 6 = Sugar Island Township Park	8/11/2009	956	33.4	Cloudy	
Site 7 = Welch	8/11/2009	554	37.3	Cloudy	
	DATE COLLECTED	INDICATOR (CFU/100ML)		Weather	Field Observations
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	8/18/2009	283.7	17.7	sunny	
Site 2 = Harrington	8/18/2009	1266.7	63	sunny	
Site 3 = Eitrem COVE	8/18/2009	2265.6	127.4	sunny	

Site 4 = Eitrem EAST	8/18/2009	>2419.6	14	sunny	
Site 5 = Smith	8/18/2009	884.2	40.5	sunny	
Site 6 = Sugar Island Township Park	8/18/2009	1016.4	47.8	sunny	
Site 7 = Welch	8/18/2009	603.4	65.1	sunny	
	DATE COLLECTED	INDICATOR (CFU/100ML)	Weather		Field Observations
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	8/25/2009	757.4	50.4	cloudy	
Site 2 = Harrington	8/25/2009	441.9	67.6	cloudy	Tampon applicator found between Harrington and Eitrem
Site 3 = Eitrem COVE	8/25/2009	>2419.6	130.6	cloudy	several tampon applicators found, one syringe found
Site 4 = Eitrem EAST	8/25/2009	678.3	13.7	cloudy	one tampon applicator found
Site 5 = Smith	8/25/2009	343.9	26.3	cloudy	
Site 6 = Sugar Island Township Park	8/25/2009	311.7	41.1	cloudy	
Site 7 = Welch	8/25/2009	395	35.5	cloudy	
	DATE COLLECTED	INDICATOR (CFU/100ML)	Weather		Field Observations
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	8/31/2009	1257.4	60.9	Sunny	
Site 2 = Harrington	8/31/2009	>2419.6	65.2	Sunny	
Site 3 = Eitrem COVE	8/31/2009	1035.1	85	Sunny	Mr. Eitrem must have brush hogged and raked his entire beach area
Site 4 = Eitrem EAST	8/31/2009	>2419.6	205.4	Sunny	
Site 5 = Smith	8/31/2009	1534.5	236.4	Sunny	
Site 6 = Sugar Island Township Park	8/31/2009	725	31.1	Sunny	
Site 7 = Welch	8/31/2009	459.4	14.5	Sunny	Lots of Sea weed
	DATE COLLECTED	INDICATOR (CFU/100ML)	Weather		Field Observations
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	9/8/2009	585.9	11	Sunny	
Site 2 = Harrington	9/8/2009	457.4	4.8	Sunny	
Site 3 = Eitrem COVE	9/8/2009	>2419.6	59.5	Sunny	
Site 4 = Eitrem EAST	9/8/2009	791.3	6.4	Sunny	
Site 5 = Smith	9/8/2009	522.7	17.1	Sunny	
Site 6 = Sugar Island Township Park	9/8/2009	1444.5	126	Sunny	
Site 7 = Welch	9/8/2009	277.4	7.7	Sunny	
	DATE COLLECTED	INDICATOR (CFU/100ML)	Weather		Field Observations
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	9/14/2009	>2419.6	661.6	Sunny	
Site 2 = Harrington	9/14/2009	1800.5	202.1	Sunny	
Site 3 = Eitrem COVE	9/14/2009	>2419.6	>2419.6	Sunny	
Site 4 = Eitrem EAST	9/14/2009	1240.9	166.1	Sunny	
Site 5 = Smith	9/14/2009	1120.8	114.2	Sunny	
Site 6 = Sugar Island Township Park	9/14/2009	901.1	34.8	Sunny	
Site 7 = Welch	9/14/2009	1062.3	20	Sunny	Weedy debri and foamy
	DATE COLLECTED	INDICATOR (CFU/100ML)	Weather		Field Observations
SAMPLE COLLECTION POINT		COLIFORM	E.COLI		
Site 1 = Bumstead	9/21/2009	1369.3	82.6	Coudy, rain night before	
Site 2 = Harrington	9/21/2009	>2419.6	54.9	Coudy, rain night before	
Site 3 = Eitrem COVE	9/21/2009	>2419.6	547.2	Cloudy, rain night before	
Site 4 = Eitrem EAST	9/21/2009	882.5	9.9	Cloudy, rain night before	
Site 5 = Smith	9/21/2009	>2419.6	133.1	Cloudy, rain night before	
Site 6 = Sugar Island Township Park	9/21/2009	>2419.6	591.2	Cloudy, rain night before	
Site 7 = Welch	9/21/2009	1271.9	264.9	Cloudy, rain night before	