

STAFF REPORT

THE CORPORATION OF THE TOWN OF COBOURG



Report to:	Mayor and Council Members	Priority:	<input type="checkbox"/> High <input type="checkbox"/> Low
Submitted by:	Teresa Behan, Deputy Director Community Services tbehan@cobourg.ca	Meeting Type:	Open Session <input checked="" type="checkbox"/> Closed Session <input type="checkbox"/>
Meeting Date:	October 25, 2021		
Report No.:	Community Services-064-21		
Submit comments to Council			

Subject/Title: Cobourg Waterfront Water Quality Staff Update

RECOMMENDATION:

THAT Council receive this report for information purposes on the monitoring and potential mitigation planning for improved water quality; and

FURTHER THAT Council direct staff to draft a water quality policy to be presented prior to summer 2022; and

FURTHER THAT Council direct staff to include an accessible dock, E. coli DNA testing and expand yearly dredging to the 2022 budget for deliberations.

1. STRATEGIC PLAN

The Town of Cobourg Strategic Plan Components (2019 – 2022) includes the following Strategic Actions: The Town supports and cares for the social and physical well-being of its citizens. Programs: Implement a comprehensive management plan for all of the Town's assets.

2. PUBLIC ENGAGEMENT

This report is on the published agenda ten days before the meeting.

3. PURPOSE

To advise Council of the current procedures for monitoring water quality within our public waterway;

AND FURTHER; to report the findings of water quality testing, including mapping results;

AND FURTHER; to report on the planning and actions that are being considered to actively facilitate improving water quality at the Cobourg Waterfront where possible.

4. ORIGIN AND LEGISLATION

The Population and Public Health Division's *Operational Approaches for Recreational Water Guideline* is to provide direction on how boards of health must approach requirements outlined in the *Safe Water Standard and the Recreational Water Protocol*, 2018 (or as current) to reduce the risk of water-borne illness and injury related to recreational water use at public beaches and waterfronts. Partnering with individual Municipalities, and under the *Health Protection and Promotion Act* (Provincial) the Local Health Unit has the authority to eliminate health hazards and risk to the public. Within these partnerships and following guidelines within the Act, the Town of Cobourg follows testing and reporting protocols for recreational waters.

5. BACKGROUND

Since 2016 the Town of Cobourg, in partnership with the Haliburton, Kawartha, Pine Ridge District Health Unit has tested, reported, and flagged the Victoria Beach water quality for recreational purposes.

In recent years the water quality testing has been expanded to include both the Cobourg Harbour and the Cobourg West Beach.

When the E.coli (*Escherichia*) Geomean reaches results that impact the safety of recreational water users it negatively effects the enjoyment of the water and area.

Town of Cobourg Staff are investigating mitigation solutions with the goal of improving the water quality within the harbour to ensure the safe use and enjoyment of all on-water recreational users.

In 2020 the harbour shoreline testing results were consistently "High Risk" causing closures of the facility. For investigative purposes, staff took samples in the harbour in various locations as well as weekly samples at fifty feet (50') and one hundred feet (100') and shoreline in 2021.

Additionally, this summer the communications department enhanced the existing town website by adding a web page to advise of the current E. coli readings at the waterfront. This web page was very well received by members of the public and was reported to be considered very useful.

6. ANALYSIS

Historically the harbour facility by design and definition was established as a body of water sheltered by natural/artificial barriers to provide safe anchorage and permit the transfer of cargo and passengers between ships and the shore, maintained at a depth to enable safe passage.

In recent generations, Cobourg Harbour has evolved into a facility that hosts recreational in water and on-water activities.

To fully analyze the harbour water, testing was enhanced, and the results were categorized as follows:

Table One: Harbour West Shoreline Cobourg: E.Coli (cfu/100mL)

Date	Harbour West 1 (left)	Harbour West 2 (left centre)	Harbour West 3 (centre)	Harbour West 4 (right centre)	Harbour West 5 (right)	Geometric Mean	Visual Observations
31-May-21	66	24	184	40	14	44	clear; few seagulls; geese not on shore
7-Jun-21	700	80	246	280	310	260	Slightly murky; no birds on shore
14-Jun-21	1200	356	280	40	1700	382	Murky; geese on shore with babies
22-Jun-21	540	440	280	88	1180	370	Murky; a lot of geese; dredger in harbour
28-Jun-21	50	90	48	58	70	61	Slightly murky; geese and gulls on shore
5-Jul-21	50	80	42	122	90	71	Slight waves; no waterfowl; clear
12-Jul-21	810	450	310	500	540	498	waves; geese on shore; murky; poor vis
19-Jul-21	110	130	140	50	30	79	no geese on shore but out in water; very calm and clear
26-Jul-21	400	780	550	580	290	492	murky; a lot of weeds washed ashore
3-Aug-21	580	170	40	30	20	75	a lot of algae and weeds on the bottom; especially close dock area; geese here as well; clearer as you go west
9-Aug-21	90	140	200	100	50	105	algae and weeds near boat dock/launch; geese and ducks onshore and in water; a bit murky
16-Aug-21	300	290	150	80	70	149	no waterfowl on shore; some small waves; slightly murky
23-Aug-21	150	120	80	60	110	99	fairly calm; small waves; a lot of algae on harbour floor
30-Aug-21	360	270	260	290	170	262	surprisingly calm; clear; no geese a few ducks

Table Two: Harbour West 50 feet Cobourg: E.Coli (cfu/100mL)

Date	Habour West 1 (left)	Harbour West 2 (left centre)	Harbour West 3 (centre)	Harbour West 4 (right centre)	Harbour West 5 (right)	Geometric Mean
13-Jul-21	330	360	260	90	120	202
19-Jul-21	170	30	50	50	20	48
26-Jul-21	110	260	100	580	360	227
3-Aug-21	50	20	20	10	40	24
9-Aug-21	50	30	10	10	20	20
16-Aug-21	130	80	110	100	50	89
23-Aug-21	20	120	60	110	220	81
30-Aug-21	80	210	120	130	140	130

Table Three: Harbour West 100 feet Cobourg: E.Coli (cfu/100mL)

Date	Habour West 1 (left)	Harbour West 2 (left centre)	Harbour West 3 (centre)	Harbour West 4 (right centre)	Harbour West 5 (right)	Geometric Mean
13-Jul-21	30	90	130	80	30	61
19-Jul-21	40	10	50	70	20	31
26-Jul-21	120	60	150	100	120	105
3-Aug-21	10	10	20	10	40	15
9-Aug-21	40	10	10	20	10	15
16-Aug-21	330	290	200	860	10	175
23-Aug-21	20	10	210	90	180	58
30-Aug-21	100	140	130	110	270	140

Table Four: West Shore Cobourg: E.Coli (cfu/100mL)

Date	West Shore 1	West Shore 2	West Shore 3	West Shore 4	West Shore 5	Geometric Mean	Visual Observations
31-May-21	2	29	43	7	1	7	clear
7-Jun-21	124	112	174	165	109	134	Strong algae smell and accumulation to the west; gets clearer as you go west
14-Jun-21	520	400	400	680	*	488	Large waves; poor vis; high turbidity
22-Jun-21	no sample	220	220	120	80	147	A lot of high waves; high turbidity; dead gobi fish to west with a lot of washed up algae
28-Jun-21	400	114	90	400	500	241	Very turbid, zero visibility; large waves
5-Jul-21	68	22	46	46	45	43	Some waves; slight turbidity
12-Jul-21	41	88	95	263	189	111	Large waves; turbidity; poor vis
19-Jul-21	30	24	27	37	19	27	clear; fairly calm; algae on lake bottom
26-Jul-21	57	50	33	80	57	53	mild waves, some turbidity

Limit E.Coli 200 cfu/100mL
Health Unit

*June 14th - West Shore 5 sample was overgrown with E.coli and a colony count could not be performed by the lab

Geomean average 78

E-coli

Escherichia coli (abbreviated as *E. coli*) are bacteria found in the environment, foods, and intestines of people and animals. *E. coli* are a large and diverse group of bacteria. Although most strains of *E. coli* are harmless, others can make you sick. Some kinds of *E. coli* can cause diarrhea, while others cause urinary tract infections, respiratory illness and pneumonia, and other illnesses.

Geometric Mean (Geo-mean)

The geometric mean is often used for a set of numbers whose values are meant to be multiplied together or are exponential in nature, such as a set of growth figures. This measurement is not an average.

Escherichia Testing Results

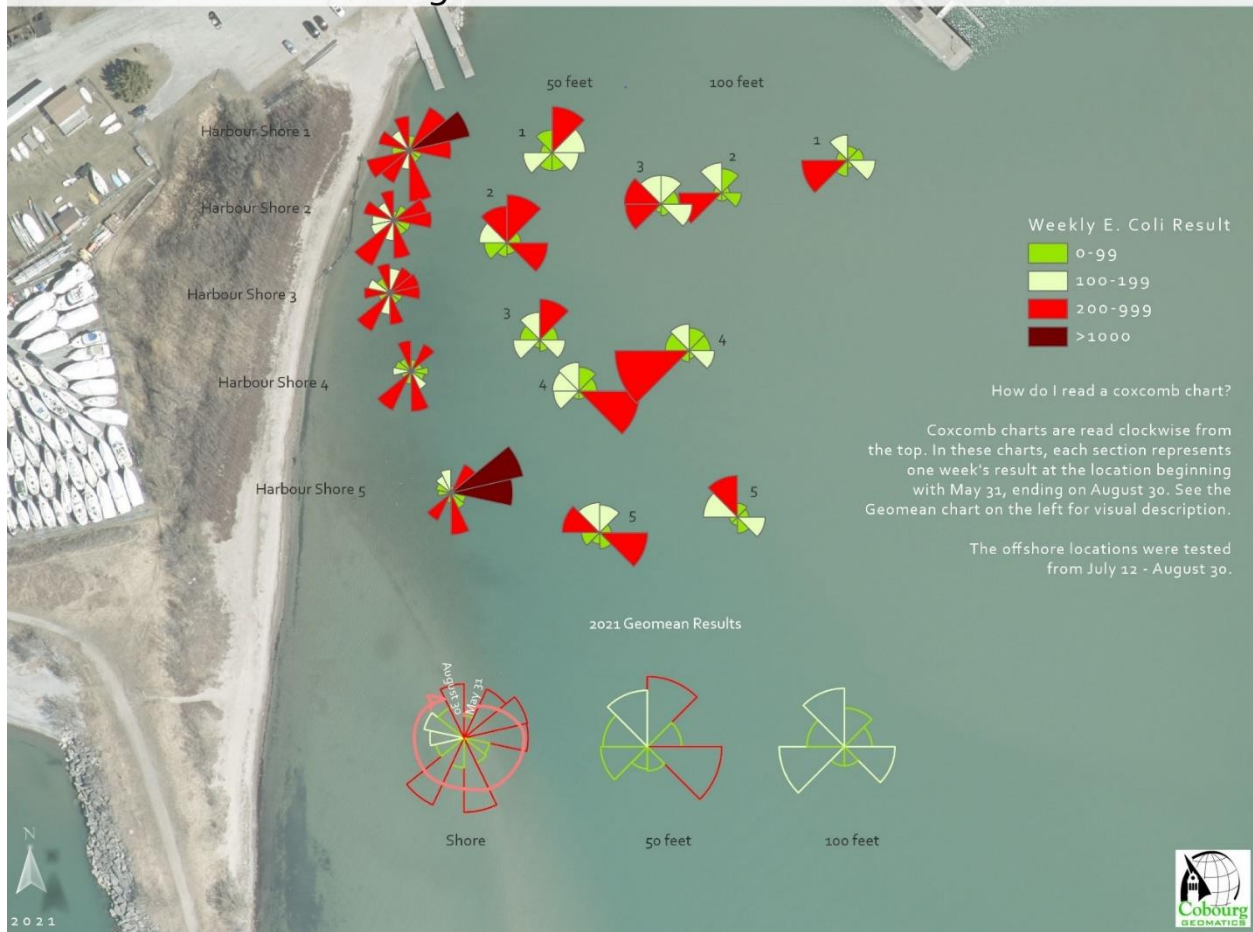
(0-199 *cfu*) all recreational activities including swimming are considered safe.

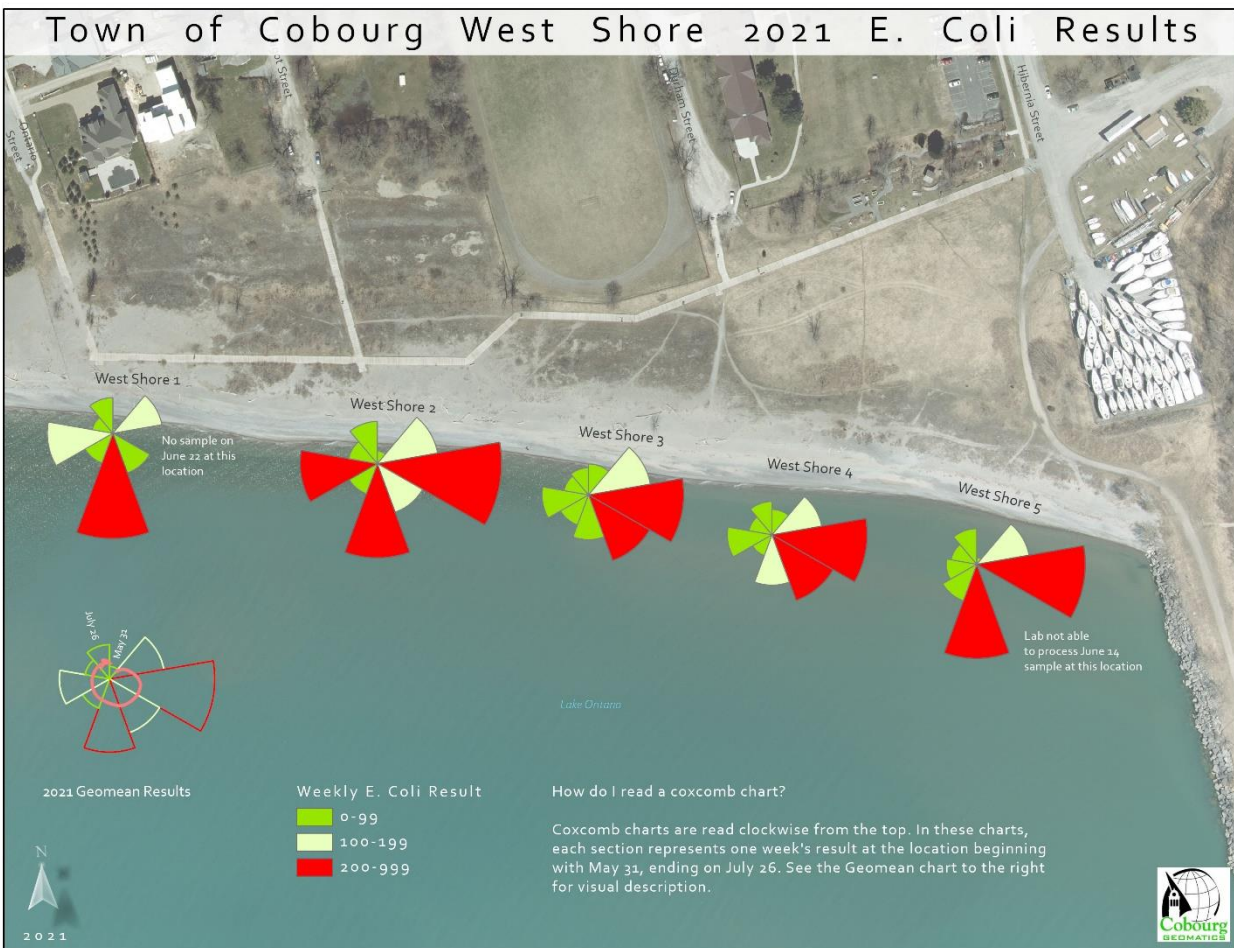
(200-999 *cfu*) some activities are not recommended including swimming.

(1,000+ *cfu*) all recreational activities including swimming and non-propelled watercraft meaning kayaking, canoeing, paddle boarding, etc. are considered unsafe.

For further analysis staff used Cobourg's Geometrics Information System to create a Coxcomb Chart mapping image to better illustrate the water testing results pertaining to *E.coli* in Cobourg Harbour as below:

Town of Cobourg Harbour 2021 E. Coli Results





In a Coxcomb chart, each category is represented by a section of the disc, and each section has the same angle. The area of a section represents the value of the corresponding category.

Reading this coxcomb chart clockwise from the top, each colored section illustrates one week's E.coli result in that location.

When reviewing the results of the expanded water testing, mapping, physical observations during sampling and coxcomb chart it can be realized that the E.coli within the harbour basin is non-conforming or fluid. Although higher levels are concentrated along the shoreline they also appear in deeper waters during the season.

Moving forward, staff plan to further execute a systematic formal inquiry to discover and examine the facts and variables effecting the harbour and investigate mitigation sources where possible.

Variables that to date have been identified by staff are:

- Waterfowl, feeding has been identified as a mitigating issue to the growth in population.
- Water depth, expanded dredging this season in the basin area may have affected the testing results in a positive manner.

- Weather, although unmanageable, are there physical barriers that could be put in place to mitigate impacts.
- Filtration, in historic years the design of the west breakwater had an opening which may have allowed sand/silt to filter out of the harbour naturally.
- Source tracing, waters may be contaminated with fecal material from such sources as discharged sewage, stormwater runoff, wild or domesticated animals or humans.
- Staff to review the option of “raking” the sand area each day to pick up garbage and bird feces.

Staff have reached out to Edge-Water Research & Consulting who conduct microbial source tracking using two DNA markers for human sewage and bird fecal droppings which would be very supportive to attributing the fecal pollution to either animal or sewage sources and staff have built the investigation into the 2022 Budget.

Shoreplan Engineering have been contracted to design the repair of the piers and walls that surround the harbour and have been made aware of the E.coli contamination by staff and are cognizant of the filtration that may have existed and assisted in the past while preparing their plans.

Expanded dredging is proposed to include the west basin in 2022 in the hopes that the depth attained this season did in fact attribute to the lower E.coli results and that the deeper colder basin floor may mitigate the conditions that enhance bacteria growth.

An Accessible Dock has been added to the 2022 Budget as a tool to move users out into deeper waters where E.coli tends to be seen at lower levels.

7. FINANCIAL IMPLICATIONS/BUDGET IMPACTS

Microbial source tracking using DNA markers	\$20,000
Shoreplan Engineering West Arm design	Included in overall repair plan
Expanded Dredging	\$30,000
Accessible Dock	\$30,000

8. CONCLUSION

Community Services Division of the Town of Cobourg are providing this update on steps that have been taken thus far to research and plan for potential mitigation of high E.coli within the harbour and have included extensions of these results during budget planning.