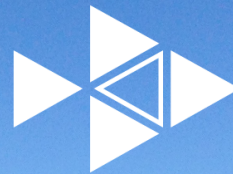


BUI 10 BEACH CLOSINGS CRITERIA UPDATE

OCTOBER 2020



HAMILTON
HARBOUR
REMEDIAL ACTION PLAN



Beach Closings

Criteria Update



Although the waters of Hamilton Harbour's Pier 4 Park beach are generally safe to swim, there are times when they are not such as after large rainstorms. Hamilton Public Health monitors the water quality at this beach during the swimming season and alerts the public when it is not advisable to swim. The Hamilton Harbour Remedial Action Plan works with partners to lessen algal blooms and control geese at the beach with the ultimate goal of improved water quality. Periodically, goals (criteria) of the Remedial Action Plan are reviewed and modernized as knowledge is gained.

Previous Criteria (2012)

Hamilton Harbour public beaches (Bayfront Park and Pier 4 Park) meet the provincial beach management protocol 80% or more of the swimming season for a minimum of three consecutive years.

New Criteria (2020)

- (1) For a minimum of three consecutive years, Hamilton Harbour public bathing beaches be open 80% or more of the swimming season as determined by the City of Hamilton Public Health Unit.
- (2) Where attainment of over 80% of the swimming season cannot be achieved the following conditions must be met:
 - (a) Sources of fecal pollution are identified and remedial actions and management plans are implemented; and
 - (b) The causes for beach postings (e.g., cyanobacteria) are known and appropriate risk management strategies and communication plans are in place to protect human health.



BUI 10 BEACH CLOSINGS DECISION MAKER

CRITERION 1

For a minimum of three consecutive years, have Hamilton Harbour public bathing beaches been open 80% or more of the swimming season as determined by the City of Hamilton Public Health Unit?

YES

**NOT
IMPAIRED**

NO

CRITERION 2A

Are sources of fecal pollution identified?

NO

YES

CRITERION 2A

Are remedial actions and management plans implemented?

NO

YES

CRITERION 2B

Are the causes for beach postings known (e.g., cyanobacteria)?

NO

YES

CRITERION 2B

Are appropriate risk management strategies and communication plans in place to protect human health?

NO

YES

NOT IMPAIRED

IMPAIRED



BUI 10 Beach Closings

Background and Rationale for the Changes

What was the original rationale for the Beneficial Use Impairment for Beach Closings?

The International Joint Commission (IJC) provided guidance around the issues related to beach closings. The original intent was to address fecal contamination related to domestic (human) sewage issues that were affecting swimming at beaches. Swimming in waters that have pollution can cause infections of the ear, eye, nose, throat, and skin and may cause diarrhea if that water is ingested. Waterborne illnesses can be caused by different viral, protozoan or bacterial pathogens. Enteric and fecal coliform bacteria (normally found in human/animal feces) such as *Escherichia coli* (*E. coli*) are the most common indicator of fecal pollution. This was the original focus related to issues for Beach Closings.

IJC Context*:

In 1991, the IJC provided listing/delisting guidelines on 14 Beneficial Use Impairments (BUI) which could apply to an Area of Concern (AOC). These guidelines were to be used to identify AOCs and their impairments, guide remedial actions, and provide the guideline to be met in order to delist an AOC. The guidance was issued with the understanding that it would be adapted to address local jurisdictions, address local factors that cause the local AOC-specific impairment, and that there would be updates to the listing/delisting guidelines over time, as appropriate.

Listing Guideline

When waters, which are commonly used for total-body contact or partial-body contact recreation, exceed standards, objectives, or guidelines for such use.

REFERENCE: Adapted from United States and Canada, 1987; Ontario Ministry of the Environment 1984. COMMISSION APPROVES LIST/DELIST CRITERIA FOR GREAT LAKES AREAS OF CONCERN - Volume 16, Issue 1, ISSN 0832-6673 March/April 1991 – “the International Joint Commission approved the following guidelines for listing and delisting Areas of Concern in the Great Lakes Basin Ecosystem. These guidelines are the result of months of work coordinated by the Great Lakes Water Quality Board and input from more than 200 interested citizens and scientists”

How do you define a public beach, a beach posting, and a beach closing?

In Ontario, local boards of health identify “public beaches” that are operated by municipalities (or Ontario Parks) based on the likelihood of the beach being used by the public, primarily due to access and the presence of signage, lifeguards, etc. Public health units are responsible for ensuring appropriate monitoring and reporting

out on public beach water quality to the public, as outlined in the Recreational Water Protocol. The Ministry of Health (MOH) provides guidelines for public health units in the document, Operational Approaches for Recreational Water Guideline (MOHLTC, 2018), which provides the following four definitions in the glossary:

Advisory: a precautionary notice that informs members of the public about specific risks to health and safety to allow them to take measures to protect themselves.

Swimming Advisory: may be issued when beach water quality is not suitable for recreational use. For example, exceedance of the recreational water accepted value for E. coli bacteria.

Beach Posting: to communicate advisories and/or place signs in response to a swimming advisory or beach closure. Postings are typically communicated through an update on the local health unit's website or through local media/newspapers. Beach postings inform the public about potential risks to health and safety, based on an assessment of those risks. The owner/operator of the beach is primarily responsible for posting and removing the advisory/signs as conditions warrant.

Beach Closure: to cause restriction/elimination of public access to a beach or specific beach areas where a significant risk to health and safety has been identified. The board of health will direct the owner/operator of the beach to post signage and/or erect barriers/barricades at appropriate locations to reduce the risk of public exposure to the health hazard.

How are Beach Closings measured/used as a Beneficial Use Impairment Criteria?

The term "beach closure", which was identified by the IJC as a BUI for Areas of Concern, is not reflective of current beach management process. Instead, we track the number of "beach postings", which occur over the swimming season (generally from the May long week-end, through to the September Labour Day week-end) and are typically the result of swimming advisories due to the presence of E.coli above the MOH recreational water threshold value. Based on IJC criteria, the goal is to have the beach open (i.e. not posted), more than 80% of the swimming season.

However, a posting may also occur due to the presence of potential hazards to human health and safety (e.g., algae in the water, debris, high water levels) or severe contamination (leading to a Beach Closure). Poor water quality conditions and/or potential hazards are typically determined through monitoring/and or visual observations by the PHUs.

What are the Ministry of Health Guidelines recreational water thresholds?

Effective 2018, the Ontario Ministry of Health (MOH), through the Recreational Water Protocol and the Operational Approaches for Recreational Water Guidelines, replaced the provincial objective for recreational water use at public beaches from a geometric mean of ≤ 100 E. coli colony forming units (CFU) per 100 mL with a provincial threshold of a geometric mean of ≤ 200 E. coli CFU/100 mL (MOHLTC, 2018). The guideline also introduced a single-sample maximum concentration of ≤ 400 E. coli / 100 mL.

What are the Beach Closing Criteria used in AOCs in Ontario?

Of the 6 Ontario AOCs with an “Impaired” status for the Beach Closings BUI, most of have either maintained the previous recreational water objective of a geometric mean of ≤ 100 E.coli colony forming units (CFU) per 100 mL or have proposed moving to the Canadian recreational water quality guideline of a geometric mean of ≤ 200 E. coli colony forming units (CFU) per 100 mL, and applying various percentages for meeting the criteria (e.g. 80% of the monitoring season, and for different lengths of monitoring intervals (1-5 years). None have specifically identified the single sample maximum (≤ 400 E.coli cfu/100ml) in the BUI criteria. Other water quality considerations are outlined as criteria, including general statements such as: improved bacteriological water quality conditions for the public beaches; sources of fecal pollution that could contaminate the beach or recreational waters are identified/ known; and are attributable to significant rain events.

The application of risk mitigation measures are also incorporated as criteria in some AOCs (e.g. pollution control plans have been developed and implemented; risk management actions (e.g., postings, signage, education, rain rule) are in place to protect human health).

What are the current Beach Closings Criteria for Hamilton Harbour?

There are currently two beaches within Hamilton Harbour defined as public beaches. In 2012, the Remedial Action Plan (RAP) Forum identified these two new man-made public beaches which opened in 1995 in the revised criteria for this BUI. The current criteria from 2012 is:

When Hamilton Harbour public beaches (Bayfront Park and Pier 4 Park) meet the provincial beach management protocol 80% or more of the swimming season for a minimum of three consecutive years.

Since that time, a review by Environment and Climate Change Canada and the Ministry of Conservation, and Parks of the various criteria being applied in the AOCs recommended that Remedial Action Plan consider the updated 2018 MOH guidelines. This review was conducted as a result of these guidelines being used in other AOCs as well as at other Hamilton beaches. As a result, revised criteria are being proposed or reviewed.

What are the proposed Beach Closings Criteria and the rationale for the change?

- (1) For a minimum of three consecutive years, Hamilton Harbour public bathing beaches be open 80% or more of the swimming season as determined by the City of Hamilton Public Health Unit.
- (2) Where attainment of over 80% of the swimming season cannot be achieved the following conditions must be met:
 - (a) Sources of fecal pollution are identified and remedial actions and management plans are implemented; and
 - (b) The causes for beach postings (e.g., cyanobacteria) are known and appropriate risk management strategies and communication plans are in place to protect human health.

Rationale for revised criteria:

Criterion 1

- a. The main reason for recommending revisions to the 2012 delisting criteria are to update the numeric criteria to be consistent with recent changes to the MOH thresholds for recreational waters (MOHLTC 2018) and to be consistent with the practices employed by the City of Hamilton's Public Health Unit.
- b. "...The change to use the national guideline resulted from extensive consultations with public health agencies over 2017 and 2018 as part of the Modernization of the Ontario Public Health Standards (OPHS) and related Protocols and Guidelines. The national guideline is based on detailed work of experts on the Federal Provincial and Territorial Recreational Water Committee and is endorsed by Health Canada. <https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-recreational-water-quality-third-edition.html> . Previously, some public health units were using the national guideline while others were using ≤ 100 CFU/100mL (5 samples minimum), a threshold which dated back to the early 1990's. The change to the national guideline was informed by a comparative review of the two thresholds carried out by Public Health Ontario. The review concluded that, although increasing the threshold from 100 CFU/100mL to 200 CFU/100mL may result in fewer beach closures and a lower water quality for swimming, there is no significant impact to the health of bathers." (Niagara River RAP Beach Closings BUI summary, 2019).
- c. The target percentage of open beaches to be achieved remains the same i. e. 80% being met. The Blue Flag Canada beach criteria use similar metrics (80% of geometric mean results are below the limit value). The Blue Flag designation is an internationally-recognized eco-label for beaches that meet strict criteria in four categories (one being water quality) (Environmental Defence 2018).
- d. Removal of the reference to the two beaches in Criteria 1 allows for flexibility as beaches can be removed or added by the municipality over time and keeps the criteria more up to date and current.

Criterion 2

During the three years, if monitoring and assessments indicate that factors beyond issues of fecal contamination related to domestic sewage are causing the beach postings, there is a need to address the risk and implement other remedial actions. Where causes are unknown, this condition will address the need to support an evaluation into the causative factor(s). This condition will also provide for the development of outreach/education and communication initiatives to be developed and supported. This condition will support efforts that address the direct causes related to fecal contamination and/or develop an understanding of issues that may be beyond the control of the RAP (i.e. more of a lakewide or broader Great lakes issue) and therefore not practical or feasible to address in the RAP.

What is the difference between what is measured for posting by the PHU and what is measured by the BUI criteria?

Determination of the percentage of days a beach is opened for the purposes of the RAP will be based on the same method of assessing beach water quality that the PHU uses to determine whether to post a beach. Thus the number of days a beach is posted by PHU is reflected in the three-year seasonal roll up by the RAP to compare against the BUI.

Both assessments will use all the factors that determine whether a beach should be posted. That is, it will incorporate any postings related to blue-green algae, water levels, and other health and safety hazards in calculating the number of days the beach is swimmable.

How will other factors that cause beach postings be addressed by the RAP?

These BUIs/AOCs were designated in 1987. At that time, the BUI generally reflected the input from poorly managed/treated municipal and industrial discharges. Since that time there have been great improvements in the control of these sources of pollution. However, other stressors are now affecting beach postings in this AOC, as well as throughout the Great Lakes. These factors include intensive urbanization, more intensive agriculture and climate changes. These pressures (e.g. higher nutrient inputs and higher precipitation) have resulted in other impacts that affect beach postings, such as the increased presence of blue-green algae and high water levels.

For Hamilton Harbour, blue-green algae are an issue for beach postings at these two beaches. In recent years, Hamilton Harbour beaches were on track to meet the 80% based on E. coli results, but were posted for the latter part of the season due to the visual presence of the blue-green algae.

The Hamilton PHU implements closures when blue-green algae are visible and toxins test above the threshold. Data indicate that in 2017 and 2018, the beaches remained largely open until the occurrence of blue-green algae in mid-July and early August, when the beach became closed for the remainder of the season. Up to that point, it was on track to meet the 80% target of being open for the season. In 2019 Pier 4 Beach was the only beach monitored in Hamilton Harbour. It was closed all season due to high water levels, however continued monitoring for E. coli indicated it would have been open 100% of the season prior to the arrival of blue-green algae in early August.

While the above are not conditions with specific targets in the BUI criteria, it is important to recognize that other factors beyond the original concerns with sewage/fecal contamination related to this BUI are part of the regular monitoring and activities of the PHU in Hamilton related to recreational swimming, and that both beach postings and management actions address the conditions related to the fecal contamination or other issues or hazards.

