



Essex Region Conservation Authority

Essex Region Source Protection Committee Meeting Agenda

Meeting Date: Wednesday, September 13, 2023

Time: 4:00 pm

Location and Details: Essex Civic Centre, Room C

List of Business	Page Number
1. Land Acknowledgement	
2. Call to Order	
3. Chair's Welcome	
4. Declarations of Conflict of Interest	
5. Approval of Agenda	1-3
THAT the agenda for the Wednesday, September 13, 2023 meeting of the Essex Region Source Protection Committee (SPC) be approved.	
6. Adoption of Minutes	
A. Essex Region Source Protection Committee (SPC)	4-9
2023-03-08 Meeting Minutes	
THAT the minutes of the Source Protection Committee meeting held on Wednesday, March 8, 2023 be approved as presented.	

B. Essex Region Source Protection Authority (ERSPA) 10-11

SPA 01/23

Essex Region Source Protection Authority Appointment of Liaison to Source Protection Committee

7. Correspondence

None.

X-X

8. Presentations

Identifying microbial mechanisms of the break down of microcystin-LR in Lake Erie beach sand on Pelee Island using genetic techniques

- Presented by Chelsea Salter, MSc.

9. Reports

A. SPC 06/23 12-43

S.36 Update – Evaluating Microcystin as a Drinking Water Issue for all Drinking Water Intakes in the Essex Region and ERCA Water Quality Program Update

THAT microcystin-LR be identified as an issue under the Clean Water Act pursuant to Rule 115.1 for the following drinking water intakes in the Essex Region; and further,

THAT the technical work be included in the updated Assessment Report as part of the forthcoming amendment to the Source Protection Plan, under Section 36 of the Clean Water Act; and further,

THAT the SPC approve the amended policies to be submitted to the MECP for early engagement

B. SPC 07/23 44-51

S.36 Update – Dense non-aqueous phase liquids (DNAPLS) – new policies

THAT the SPC approve the attached amended policies to be submitted to the MECP for early engagement

C. SPC 08/23

51-60

*S.36 Update – Combined Sewer Overflow/Sanitary Sewer Overflow Policy
Amendments for Prescribed Instruments*

THAT the SPC approve the attached amended policies to be submitted to the
MECP for early engagement.

10. New Business

None.

11. Other Business

To be presented during the virtual meeting of the SPC.

12. Adjournment

THAT the September 13, 2023 meeting of the Essex Region Source Protection
Committee be adjourned.

Next Meeting

The next meeting of the Essex Region Source Protection Committee is tentatively to be held on
November 8, 2023.

We have quorum with 10 members present, 2 members present by Zoom and 1 member present by proxy. I will call the meeting to order at this time, 4:06 pm.

2. **Land Acknowledgement**

We would like to begin by acknowledging that this land is the traditional territory of the Three Fires Confederacy of First Nations, comprised of the Ojibway, the Odawa, and the Potawatomi Peoples.

We acknowledge the harms and mistakes of our past as we continue to move forward in the spirit of reconciliation.

As we do at our meetings, I'll begin with a statement of hope and a statement of gratitude. I'm grateful that we have the opportunity to meet together in this in-person format, and I hope that we are able to get a great deal accomplished in our meeting today.

3. **Chair's Welcome**

Welcome all. We have not yet had confirmation of our SPA liaison, and will have to wait until June to welcome Larry.

Beth Forrest is here to give us an update from the province. We look forward to hearing from her later.

Katie and I went to the Board of Director's orientation meeting last month to give an overview of their duties at the Source Protection Authority

At the end of the month, I'll be attending a meeting with Kirsten Service, Director of Conservation and Source Protection for the Ministry. The suggested agenda includes:

1. The future of Source Protection Authorities
2. Our empowerment as the main authority on Source Water Protection in the region
3. Where the program is going in the next 5 years.

Please submit any opinions or comments along these lines soonest and I will bring them to the meeting.

You will also be asked in the meeting today to provide input to the SPC Chair comments to be include in the progress report. Please don't hesitate to speak up.

B. Report SPC 04/23 – Draft Responses for the 2022 Annual Reporting Template

THAT the Essex Region Source Protection Authority Annual Progress Report be submitted to the MECP on or before May 1, 2023 pending suggested changes and additions made by the SPC, and endorsement by the SPA

Resolution SPC 10/23 Moved by Tim Mousseau
Seconded by John Barnett

Carried

C. Report SPC 05/23 – S.36 Update – Combined Sewer Overflow/Sanitary Sewer Overflow Policy Amendments

THAT the SPC approve the attached amended policies to be submitted to the MECP for early engagement and, further;

THAT the SPC approve the suggested removal of specific policies noted in SPC Report 05.23

Resolution SPC 11/23 Moved by Thom Hunt
Seconded by Matthew Merrett

Carried

11. New Business

None.

12. Other Business

None.

13. Adjournment

Resolution SPC 12/23 Moved by Tim Mousseau
Seconded by Ron Barrette

That the March 8, 2023 meeting of the Essex Region Source Protection Committee be adjourned at 5:08 pm. **Carried**

Next Meeting

The next meeting of the Essex Region Source Protection Committee will be held on September 13, 2023 starting at 4:00 pm at the Essex Civic Centre, Room TBD.



Tom Fuerth
Chair



Katie Stammler
Water Quality Scientist/
Project Manager Source Water Protection



Essex Region Source Protection Authority

SPA 01/23

From: Tim Byrne, CAO/Secretary-Treasurer

Date: Thursday, March 30, 2023

Subject: Essex Region Source Protection Authority Appointment of Liaison to Source Protection Committee

Recommendation: THAT Mr. Larry Verbeke be reappointed as the Source Protection Authority Liaison as described in SPA 01/23.

Purpose

To recommend the appointment of a Source Protection Authority Liaison to the Source Protection Committee.

Discussion

As outlined in the Clean Water Act, 2006, under Ontario Regulation 288/07, the Essex Region Source Protection Committee (SPC) has been created to develop a Source Protection Plan to protect municipal sources of drinking water in the Essex Region Source Protection Area.

The SPC Committee consists of 15 members plus a Chair and is comprised of representatives from sectors that encompass the broad, multi-sector interests of our region including local municipalities, the local economy (i.e. agriculture, commerce, industry, and small business), and members representing other interests including environmental, health and other public interests.

The Source Protection Committee also includes liaisons from the Source Protection Authority, the Windsor-Essex Public Health Unit, and the Ministry of the Environment, Conservation and Parks.

Deputy Mayor Larry Verbeke has been served as the Source Protection Authority's Liaison since 2011 and was previously a member of the Source Protection Committee. During this time, Deputy Mayor Verbeke has been actively involved in meetings and contributing to committee reports and the Source Protection Plan for the region. Given Mr. Verbeke's knowledge and background of Source Water Protection in Essex Region and his desire to remain in the role of Liaison, it is recommended that he continue in the role of Source Protection Authority Liaison.



Tim Byrne, CAO/Secretary-Treasurer

Attachments:

None



Essex Region Source Protection Committee

Report 06/23

From: Katie Stammler, Source Water Project Manager

Date: Tuesday, September 5, 2023

Subject: S.36 Update – Evaluating Microcystin as a Drinking Water Issue for all Drinking Water Intakes in the Essex Region and ERCA Water Quality Program Update

Recommendation

THAT microcystin-LR be identified as an issue under the Clean Water Act pursuant to Rule 115.1 for the following drinking water intakes in the Essex Region; and further,

THAT the technical work be included in the updated Assessment Report as part of the forthcoming amendment to the Source Protection Plan, under Section 36 of the Clean Water Act and further,

THAT the SPC approve the attached amended policies to be submitted to the MECP for early engagement

Summary

- Microcystin, a parameter listed on schedule 2 of the Ontario Drinking Water Quality Standards, has the potential to be a drinking water issue. It was already determined to be a drinking water issue for Lake Erie drinking water intakes in 2014 and included as such in the existing SPP
- Microcystin data at Lake St. Clair drinking water intakes were reviewed using the issues evaluation methodology in 2021 when the SPC determined that microcystin-LR should be identified as an issue for these intakes
- Based on the information presented, the SPC will advise on whether to identify microcystin-LR as a drinking water issue for Detroit River drinking water intakes and will re-evaluate the status for Lake Erie intakes

Discussion

In response to the growing concerns related to harmful algal blooms (HABs), microcystin-LR was identified as a drinking water Issue for Lake Erie intakes in the ERSPA (Harrow-Colchester, Union, Pelee Island and Wheatley WTPs) in 2014. In the 2018 ERSPA S.36 Workplan, the SPC noted that HABs also occur annually in Lake St. Clair and that microcystins have been detected in the raw water at both the Lake St. Clair and Detroit River intakes. The SPC recommended that available data be analyzed to determine if microcystin-LR should also be considered a drinking water issue for drinking water intakes in Lake St. Clair and the Detroit River. As noted by municipal staff, HABs are also an operational concern for WTPs in Lake St. Clair and the Detroit River. The SPC determined that microcystin-LR should be identified as an issue for Lake St. Clair drinking water intakes following their review of SPC report 05/21.

The attached report has been prepared to be included as an appendix to the Source Protection Plan, replacing the existing Appendix XV. The report provides detailed information covering background on harmful algal blooms (HABs) in Lake Erie and Lake St. Clair, phosphorus as a key nutrient for algal growth, and how to evaluate whether a contaminant is a drinking water issue. The report also includes a summary of the results of a survey provided to all of the drinking water operators in the Essex Region who provided information on their monitoring, response and treatment processes during a HAB. Importantly, microcystin-LR is considered to be an operational concern for all water treatment plants (WTPs) in the Essex Region. Data sources and analysis methods are outlined followed by the presentation of the results for all WTPs in the Essex Region. This includes the analysis for the Lake St. Clair intakes, with the inclusion of 2022 data, which does not change the decision made in 2021. This will be the first time microcystin-LR is reviewed for identification as an issue for Detroit River intakes. The data and analysis for the Lake Erie intakes has been updated and presented in the same manner as the other intakes.

The report also highlights some concerns with consistency with data sources and data management. In short, the drinking water surveillance program (DWSP) included analysis for microcystin up to 2018 after which time it became the responsibility of municipalities to provide this analysis. From 2019 onward, private labs have been used for this analysis. The benefit of this for municipalities is that the turn around for receipt of results is much faster. However, there are differences between the laboratories in terms of their analysis and presentation of data. For one WTP (Union) there are data available from DWSP and a private lab for the same time period, which shows a substantial difference in the results. As well, there is no data for the source water at the Pelee WTP after 2018. This indicates a need for more consistent management and oversight of monitoring of HABs and toxins.

The SPC will evaluate the information in this report to determine whether microcystin-LR should be considered to be a drinking water issue for the Detroit River and Lake Erie drinking water intakes. They will also review the associated amended policies.

Options to consider

The MECP provided the following options for identifying microcystin as a drinking water issue for Lake Erie intakes when the ERSPCA conducted similar work in 2014

1. if the issue is identified under the technical rules (114), then an Issue Contributing Area (ICA) must be delineated, Significant Drinking Water Threats (SDWT) must be identified, and policies to address the threats must be completed.
2. if the issue is identified under the CWA ONLY, then the Issues Contributing Area cannot be delineated nor SDWTs be identified within the ICA related to the Issue. To address this, the SPC still has the option to include the Lake St. Clair drinking water intakes in the existing policies written under S. 22(2)-[7] of the CWA already in place for Lake Erie intakes for microcystin.
3. if there is no issue identified, the SPC has the option only to write generic policy as E&O / Incentive Programs under S.22 [7] of the CWA considering that the policies meet the objectives of the Source Protection Plan.

Previous decisions made by the SPC used Option 2 to identify microcystin-LR as a drinking water issue for Lake Erie intakes (2014) and Lake St. Clair (2021).

Policy Options

Because we are unable to delineate an Issue Contributing Area, we are limited to Education and Outreach, and Monitoring policies, which are non-legally binding. The two existing policies are presented for discussion. They have been updated to align with the new AODA compliant policy format and will also be updated to identify any additional intakes where microcystin-LR has been identified as a drinking water issue. There is also a recommendation to add language to the monitoring policy to advise that 'The Ministry of the Environment, Conservation and Parks should assist municipal and operating authorities with this monitoring program to ensure a consistent and reliable source of information' and that 'Municipalities with combined sewer overflows should continue to monitor these events.' The rationale statement for these policies will reflect material in the attached report.

Update on ERCA's Water Quality Monitoring Program

While the monitoring, and education and outreach policies in the Essex Region SPP related to microcystin-LR are non-legally binding, ERCA is committed to working with senior levels of government and other partners to implement relevant actions to reduce phosphorous in our region. ERCA's water quality monitoring program was enhanced at strategic locations for several years, including additional locations and event-based sampling. Among other benefits, this has enabled us to create a Phosphorus Management Plan and a final report on the Kingsville Leamington Nutrient project. These reports are, or will soon be, available on [ERCA's website](#). At this time, funding has ceased for ERCA's enhanced monitoring, but we continue to seek out additional sources and opportunities. ERSPA and ERCA staff participated in the development of the LEAP, attend and participate in regional and international workshops and conferences, and are members on advisory boards for multiple research projects related to HABs. As well, every opportunity is taken to provide education and outreach on HABs, phosphorus reduction and agricultural BMPs using a variety of media (e.g. in-person and virtual presentations, podcasts, televised interviews, social media, reports, etc.). Audiences include youth, community interest groups, continuing education, agriculture and the general public.

RECOMMENDATION

THAT microcystin-LR be identified as an issue under the Clean Water Act pursuant to Rule 115.1 for the following drinking water intakes in the Essex Region; and further,

THAT the technical work be included in the updated Assessment Report as part of the forthcoming amendment to the Source Protection Plan, under Section 36 of the Clean Water Act and further,

THAT existing policies to address microcystin-LR as a drinking water issue in the Essex Region Source Protection Plan be amended to include all drinking water intakes in the Essex Region where microcystin-LR has been identified as an issue pursuant to Rule 115.1



Katie Stammler, PhD
Project Manager, Source Water Protection/
Water Quality Scientist

1. Evaluation of microcystin as a drinking water issue for all drinking water intakes in the ERSPA
2. Draft policies for microcystin-LR

Evaluation of microcystin as a drinking water issue for all drinking water intakes in the ERSPA

Purpose and Scope

The Issues Evaluation Method (Appendix VI) and the Technical Rules of the Clean Water Act were used to determine if microcystin-LR is a drinking water Issue for Water Treatment Plants in the Essex Region Source Protection Area. Available total microcystins data from drinking water intakes and interviews with water treatment operators were analysed following the Issue Evaluation Method.

Background

Harmful algal blooms (HABs) are an annual occurrence in the nearshore areas of Lake St. Clair and in the western basin of Lake Erie. The organisms that cause HABs are cyanobacteria, also known as blue-green algae (e.g. microcystis and anabaena) that produce toxins (e.g. microcystins) that can be harmful to human health. Microcystin is a neurotoxin which is present in blue green algae (cyanobacteria) and consists of several congeners, including –LR, which is considered to be the most toxic. It is released into the water when the cell wall breaks. Microcystin-LR is a parameter listed on schedule 2 of the Ontario Drinking Water Quality Standards with a maximum allowable concentration (MAC) of 1.5 ug/L.

Laboratory analysis typically involves an initial ELISA test for total microcystins (i.e. all congeners). The analysis to determine specific congeners (e.g. Microcystin-LR) is cost prohibitive so it is only conducted when it is deemed necessary, and that analysis can only be conducted at the MECP accredited lab. However, microcystin-LR tends to be the dominant congener of microcystins in the lower Great Lakes (Palagam et al. 2020; Dyble et al. 2008); therefore, we can assume that total microcystins are an appropriate estimate of microcystin-LR.

Whole lake experiments conducted by David Schindler in the Experimental Lakes Area tested and confirmed the theory that phosphorus is the key nutrient that drives eutrophication (high nutrient concentrations that lead to overgrowth of algal biomass) (Schindler, 1977). Under the 1972 Great Lakes Water Quality Agreement (GLWQA, 2012), the U.S. and Canada reduced phosphorus inputs to the Great Lakes, including Lake Erie. Between the late 1960s and early 1980s there was an approximate 60% reduction in the phosphorus loading to Lake Erie and a subsequent reduction in algal blooms. Despite continuing to meet targets for phosphorus loads, however, Lake Erie began to experience algal blooms again in the late 1990's, with 2011 and 2015 as the largest blooms on record (ECCC & MECP, 2018).

The National Oceanic and Atmospheric Administration (NOAA) uses a suite of models to predict the severity (i.e. size and biomass) of the HAB in Lake Erie each year. The prediction is largely based on phosphorus loads from the Maumee River in Ohio, which are highly dependent on rainfall events during the late winter and early spring months. Once a HAB occurs, NOAA provides weekly updates on the current and predicted extent of the HAB and at the end of the season, a final report is provided. These reports are all [publicly available](#). Importantly, the

forecasts cannot predict toxicity and do not include Lake St. Clair. The toxicity of a HAB is dependent on myriad factors that are highly variable and difficult to model, which is why monitoring during a HAB is essential.

Each seasonal forecast also includes a summary of the severity of HABs in previous years (**Figure 1**). Severity is scored on a 10 point scale. When the scale was developed, 2011 was the worst year on record and was given a score of 10, however 2015 was considered more severe and received a score of 10.5. Severe HABs were also observed in 2017 and 2019. Since 2020, HABs in Lake Erie have been considered moderate and the extent has rarely reached the north shore where the Essex Region drinking water intakes are located. These moderate blooms are considered to be attributable to drier conditions in the late winter/early spring months, resulting in lower nutrient loads and not necessarily to mitigation actions. It is normal for the Great Lakes to experience cycles of wetter and dryer years, so we must be prepared to expect HABs in any given year. The location and extent of a HAB and distribution of toxins are dependent on weather conditions, wind and lake currents. The Essex Region Source Protection [Annual Progress Reports](#) also include a summary of HAB conditions and related activities each year.

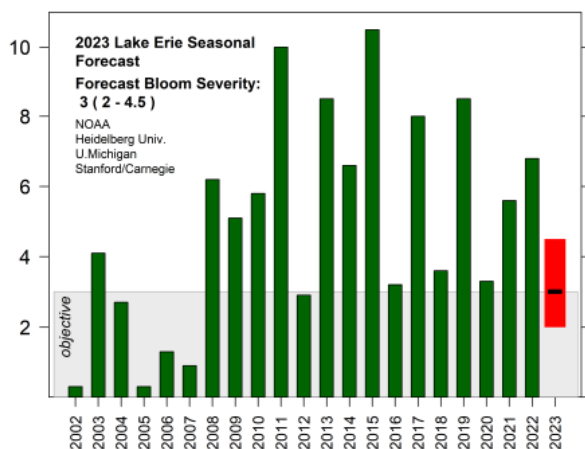


Figure 1 – Bloom severity forecast (red) as of July 29, 2023 compared to actual severity in previous years (green). The wide red bar is the likely range of severity based on the different models used and reflect uncertainty in the July nutrient load. A severity below 3 is the goal of the Great Lakes Water Quality Agreement (GLWQA). Available Online.

Defining a drinking water issue

A contaminant can be identified as a drinking water issue if it meets certain criteria, the specifics of which are described below. Typically, when an issue is identified, an area where the contaminant likely originates from, called the issue contributing area (ICA), is defined. Significant drinking water threat (SDWT) activities are identified, and legally binding policies are developed and included in the Source Protection Plan. However, in the case of microcystins that result from HABs in Lake St. Clair and Lake Erie, it is not possible to define a reasonable ICA in which policies can be implemented. The area contributing to nutrients that determine the extent and severity of a HAB not only expand beyond the boundaries of the Essex Region, but also include watersheds in the United States, where our policies cannot be implemented. As

well, the contribution from watersheds in the Essex Region is considered to be relatively small compared to larger watersheds like the Thames and Maumee River (Maccoux et al, 2016), although the Leamington Tributaries have also been identified as a priority watershed for nutrient reduction (ERCA, 2023). Importantly, the Canadian and US Federal, Provincial and State governments have developed Domestic Action Plans (ECCC and MECP, 2018) and are investing extensive funds to address this international issue. Any policies or compliance measures will need to be broadly applied and are beyond the scope and reach of the Clean Water Act.

Identifying microcystin as a drinking water issue acknowledges that HABs are an ongoing, pervasive problem for water treatment plants in the Essex Region. This information is important when communicating with higher levels of government and helps to inform their actions and policies. Because it is not possible to identify an ICA within the scope of the Essex Region Source Protection Plan (SPP), it is not possible to identify SDWT activities nor policies to manage or prohibit activities. Instead, the SPP includes policies that require continued monitoring and the delivery of education and outreach.

Water Treatment Plants in the Essex Region

During the preparation of the 2018 ERSPA S.36 Workplan, Municipal staff at Water Treatment Plants (WTPs) were asked several questions related to HABs. All seven WTPs in the Essex Region indicated that they consider HABs to be an operational concern; this includes WTPs with intakes in Lake St. Clair, the Detroit River and Lake Erie. WTPs employ several different techniques to treat raw water during a HAB (see below). The existing treatment at all of the WTPs is currently capable of removing cyanobacteria and microcystins, however there is some concern that some systems could be overwhelmed if HABs increase in severity.

Municipal Drinking Water Licenses

All municipal drinking water treatment plants are required to have a [municipal drinking water licence](#) (MDWL), which is issued by the MECP through the Safe Drinking Water Branch. The MDWL is renewed every five years. Each MDWL contains several sections. System-Specific Conditions for each WTP are included in Schedule C of their MDWL. These conditions can include such things as rated capacities, maximum flow rates restrictions, flow measurement and recording requirements, etc. This is also where any additional sampling, testing and monitoring requirements (i.e. microcystin monitoring) are included.

All Municipal Residential WTPs in Ontario that use surface water as a source are required to have a harmful algal bloom (HAB) monitoring, sampling and reporting plan, this includes all of the surface water systems in the Essex Region. It is up to the owners to design their plan, which has to meet the minimum requirements in the license. The HAB plans for WTPs in the Essex Region are included in Schedule C, Section 6.0 of each facility's Municipal Drinking Water Licence. The sections below summarize some of the actions identified in MDWLs for WTPs in the Essex Region. Note that some actions are unique to specific WTPs, while others (e.g. monitoring) are ubiquitous.

Monitoring for HABs at Water Treatment Plants in the Essex Region

All Water Treatment Plants (WTPs) in the Essex Region employ seasonal monitoring for HABs between June and November. Typically, both raw water and treated water are collected for laboratory analysis at regular intervals, usually weekly. Established protocols require increased sampling frequency when a bloom is observed or if laboratory analysis indicates high concentrations of microcystin. Plant operators also conduct daily monitoring for evidence of a bloom by visually observing the conditions of the source water (Lake St. Clair, Detroit River or Lake Erie), visual monitoring of the influent at the shoreline/lowlift areas, monitoring the intake area through the facility's security camera and/or using binoculars, monitoring weather (rain, wind) that has direct impact as precursor to HAB formation, communication with WTP operators upstream and downstream, and/or by using satellite imagery tools. Lake Erie has additional tools available with real-time sensors deployed on buoys and weekly forecasts made available by the National Oceanic and Atmospheric Administration (NOAA).

The following operational parameters are also monitored at some WTPs

- Taste and odour events/odours noted in raw water within plant
- Increases in colour
- Detection of phycocyanin (the pigment present in cyanobacteria) using optical probes is indicative of the presence of cyanobacteria, but not the concentration of toxin
- Increases/diurnal changes in pH in the raw water
- Increases in turbidity/decreases in filter run times
- Need for increased coagulation dose
- Increases in chlorine demand or decreases in chlorine residual
- Visual cues inside treatment facilities (e.g., clarifier, filter) as cyanobacteria may accumulate on equipment even in absence of a bloom in source
- Daily Microscopic Observations

Water treatment operations during a harmful algal bloom

The toxin produced by cyanobacteria are released when the cell dies or when the cell wall is broken, which can happen during the normal water treatment process (e.g. chlorination). For this reason, it is often necessary for WTPs to alter their treatment process during a HAB. Some factors that determine when the decision is made to alter treatment include: visual detection of a bloom, detection of microcystin in the raw or treated water, weather conditions conducive to HAB formation, satellite imagery showing visible signs of a HAB. In addition, changes to certain operational parameters can also be indicative of a HAB, for example:

- Changes in pH in the raw water– Algae draws CO₂ out of the water during photosynthesis, which may cause pH to increase throughout the day. pH increases are more often observed when the bloom is expanding
- Increase in turbidity and decreases in filter run times, overall filter performance is limited
- Settler performance resulting in carryover

- Clarifier observations
- Need for increased coagulation dose – due to increased turbidity and total organic matter in water or the tendency for some cyanobacteria to float and inhibit settling
- Jar tests for coagulation settling vs floating algae
- Increase in chlorine demand or decrease in chlorine residual – due to increased organic matter loading during a bloom
- Ozone demand increases
- Visual cues inside treatment facilities (e.g., clarifier, filter) as cyanobacteria may accumulate on equipment even in the absence of a bloom in the source water

WTPs have different methods by which they treat water during a HAB, but all are effective at ensuring that there are no cyano-toxins present in the finished treated water. Importantly, all WTPs indicate that additional treatment or adjustment to treatment is necessary during a HAB. Most WTPs have sufficient treatment options and have not required updates with a few exceptions. The West WTP on Pelee Island underwent significant upgrades in 2015, Union Water Supply System (UWSS) recently acquired a new filtration system specific for the treatment of HABs, and some operators note that there is aging infrastructure that may need to be upgraded in the future.

Treatment options during a HAB include:

- Shut off or minimize pre-chlorination system that is used for zebra mussel control
- Limit flow from the intake during the day and make up water during the night (if feasible)
- Increase pre-filtration chlorination to oxidize toxin
- Increase travelling screen cleaning operation frequency.
- Use of carbon media filtration, which is known to be effective for cyanobacteria
- Closely monitor coagulation and sedimentation for removal of algae and turbidity, make adjustments to optimize clarifier operation.
- Add filter aid or polymer to enhance coagulation/filtration. Coagulation results in a heavier floc encourages the cyanobacteria to settle rather than float. At a lower coagulation, the cyanobacteria can pass through the filter as pin-floc.
- Increase settling basin sludge removal frequency where feasible.
- Increase filter backwashing frequency.
- Implement a filter-to waste cycle following backwash that is long enough to flush out any residual toxins remaining in the filters.
- Add carbon filters and/or initiate powdered activated carbon addition and/or adjust dosage, where available.
- New DAF (dissolved air floatation) unit in operation at UWSS, which is designed to manage conditions during a HAB infiltration and diverting as much flow as possible to the DAF units.
- Focus chemical disinfection on post-filtration processes.
- Increase ozone dosage
- Increase free chlorine residual

- Chlorine dosing after filtration and proper contact time in the reservoirs can mitigate any toxins if released in upstream processes. Final treated water chlorination also provides toxin oxidation and persistent residual throughout the distribution system
- Consider additional monitoring for total microcystins within treatment process (e.g., filter effluent)
- Constant monitoring of plant conditions, and frequent visual monitoring
- Depending on location of algal bloom and water demands, reduce plant production or shutdown affected plant. Use reserve water until HAB passes

Issue Evaluation

Under the Clean Water Act (CWA), the Director Technical Rules (DTR) define how to identify drinking water issues. Assessing an issue requires consideration of the rules related to issue identification. If an issue is identified pursuant to rule 114, then rule 115 outlines the information which must be included in the Assessment Report (AR). Rule 115.1 was added November 16, 2009 (along with other revisions in this section of the rules). For issues not identified pursuant to rule 114, rule 115.1 identifies the information which must be included in the AR. (This is later described as an Issue under the Clean Water Act, while Issues Identified pursuant to Rule 114 are referred to as issues identified pursuant to the rules.) Refer to **Appendix VI** of the Assessment Report for detailed information on the issue evaluation methodology that was adopted in 2009.

Rule 114:

The source protection committee shall describe a drinking water issue in accordance with Rule 115 if a listed parameter (i.e. microcystin) is present at a concentration that could deteriorate drinking water quality OR there is a trend of increasing concentrations of the parameter that that may result in the deterioration of drinking water quality.

Rule 115:

If an issue is identified with rule 114, where the drinking water issue is the result of anthropogenic causes, the description of the issue shall include the following information: the parameter, the intake at which the parameter occurred, the Issue Contributing Area (ICA) and SDWT activities that contribute to the parameter.

Rule 115.1:

For drinking water issues that are not described under rule 115, the description the drinking water issue shall include, the parameter and an explanation of the nature of the issue and the possible causes of the issue.

Data Sources

Monitoring for microcystin typically occurs weekly throughout the warmer months when harmful algal blooms may occur (June – October), with some years extending earlier or later in the season. Once the concentration of total microcystins in the raw water reaches a threshold level, sampling frequency may be increased until the toxin concentration decreases.

Data up to and including 2018 for most WTPs were obtained from the Drinking Water Surveillance Program (DWSP) which is co-ordinated by the MECP. DWSP samples were collected by staff at the WTP and analyzed by the MECP laboratory using consistent lab and data management techniques. Beginning in 2019, monitoring for microcystin became the responsibility of municipalities. Data from 2019 onward are provided directly by municipalities or their water operator authority. These data are provided in different formats with different levels of understanding as outlined below. Some WTPs have overlapping records from private labs and DWSP, DWSP data were preferentially used if both data sources were available.

Importantly, there are inherent uncertainties in the dataset. Since microcystin was removed from the suite of analytes included in the DWSP program, there is variability in how each municipality conducts their sampling and manages their data, making it challenging to gather and analyze these data. Municipalities now use private labs for analysis of total microcystins, however some labs report this erroneously as microcystin-LR. We understand that private labs cannot analyze for congeners and so assume that the data are actually total microcystins based on our evaluation of their laboratory analysis description. In addition, the municipalities are using different private labs, thus adding uncertainty due to potential differences in lab methodology. There are also gaps in some of the data records, most importantly on Pelee Island. Up until 2018, samples were collected from Lake Erie near the intake and also within the plant after sand filtration and prior to treatment. We know that the sand on Pelee Island has natural microbial characteristics that result in the break down of microcystin (Salter, in preparation) so samples taken within the plant are not truly representative of the source water conditions. Since 2019, samples have been taken sporadically within the plant, but not in Lake Erie, so there are no data available for the source water after 2018. The MECP is supporting the Township of Pelee to collect and analyze Lake Erie samples in 2023, this report will be updated once those data are available. There are also discrepancies between the results from private labs and the MECP lab when there is overlap in the data records, most notably at the Union intake, where the MECP results tend to be higher than the private lab. It would be beneficial for this pervasive issue to be monitored and analyzed consistently, with the data maintained in a managed database.

Treated water is also sampled at the same time as raw water for total microcystins. However, all water treatment facilities in the Essex Region are effective at degrading the toxin and so it has never been detected at concerning concentrations in treated water. These data are not included in this analysis.

Data Evaluation

A number of analyses were conducted following the Issue Evaluation Methodology (Appendix VI). These lines of evidence taken together were evaluated by the source protection committee to determine whether microcystin should be identified as a drinking water issue for each drinking water intake in the Essex Region.

Step 1

Surveys were circulated to Water Treatment Plant Operation Authorities during the preparation of the Essex Region s.36 Workplan in 2018, and again in 2023 in the preparation of this evaluation. In 2018 and 2023, all Operating Authorities identified microcystin as an operational concern for all drinking water intakes in the Essex Region.

Step 2

Total microcystins from the raw water intake were evaluated as follows:

- Monthly average total microcystins concentrations were calculated and plotted for all years for which data were available between 2011 and 2022
- Annual average total microcystins concentration were calculated and plotted for all years for which data were available between 2011 and 2022. Data between July and October when harmful algal blooms are most likely to produce toxins were used for this analysis
- The total number of occurrences of data points above the MAC* or ½ MAC were recorded

*the Maximum Allowable Concentration (MAC) = 1.5 ug/L and the half MAC = 0.75 ug/L.

Step 3

To make the decision to identify microcystin as a drinking water issue the following were considered:

- Data occur at MAC or ½ MAC or above
- Data are trending to MAC
- Frequency of occurrence
- Treatment Plant capability/Need for change to treatment process
- Operating Authority opinion

For each intake, the sections below will include an evaluation of each of these elements.

Possible outcomes of Issue Evaluation

The MECP provided the following options for identifying microcystin as a drinking water issue for Lake Erie intakes when the ERSPCA conducted similar work in 2014

1. If the issue is identified under the technical rules (114), then an Issue Contributing Area (ICA) must be delineated, Significant Drinking Water Threats (SDWT) must be identified, and policies to address the threats must be completed
2. If the issue is identified under the CWA ONLY (Rule 115.1), then the Issues Contributing Area cannot be delineated nor SDWTs be identified within the ICA related to the Issue. E&O and Monitoring policies can be included in the SPP.

3. If there is no issue identified, the SPC has the option only to write generic policy as E&O / Incentive Programs under S.22 [7] of the CWA considering that the policies meet the objectives of the Source Protection Plan.

Following the evaluation in 2014, members of the Technical Advisory Committee (TAC) felt that there was enough evidence of microcystin-LR at the Lake Erie drinking water intakes to consider it a concern, and therefore determined that option 3 was not appropriate. It was suggested that option 1 would be very difficult to implement given the limited microcystin data, inconclusive results of phosphorus modeling and the knowledge that HABs are an international concern with nutrient inputs from several watersheds outside of the Essex Region. By consensus, the Essex Region TAC agreed that option 2 was the best way to proceed as it allowed for identification of the issue and establishment of appropriate policies including those directed at monitoring. The Thames-Sydenham and Region TAC also separately came to the same conclusion for the same reasons. The Essex Region SPC accepted the recommendation of the TAC in July 2014 and determined that microcystin-LR be identified as an issue under the Clean Water Act pursuant to rule 115.1 at Lake Erie intakes. The Essex Region SPC will examine the results of the current analysis and consider these same options for all of the drinking water intakes in the Essex Region.

Results of Data Evaluation

For each drinking water intake, two graphs have been prepared to display total microcystin concentrations in micrograms/litre (ug/L) in the source water prior to treatment. Each graph also displays the maximum allowable concentration (MAC), which is 1.5ug/L and the half maximum allowable concentration ($\frac{1}{2}$ MAC), which is 0.75ug/L. The first graph for each intake shows monthly average concentrations for each year. The years are colour coded and are the same for each intake. The second graph for each intake displays the average concentration of total microcystins between July and October, when HABs are most likely to be present. A third graph is included to show the total number of occurrences each year when microcystin concentration was above the MAC or $\frac{1}{2}$ MAC. A summary is provided for each intake in consideration of the following metrics:

- Data occur at MAC or $\frac{1}{2}$ MAC or above
- Data are trending to MAC
- Frequency of occurrence
- Treatment Plant capability/Need for change to treatment process
- Operating Authority opinion

Lake St. Clair

Stoney Point

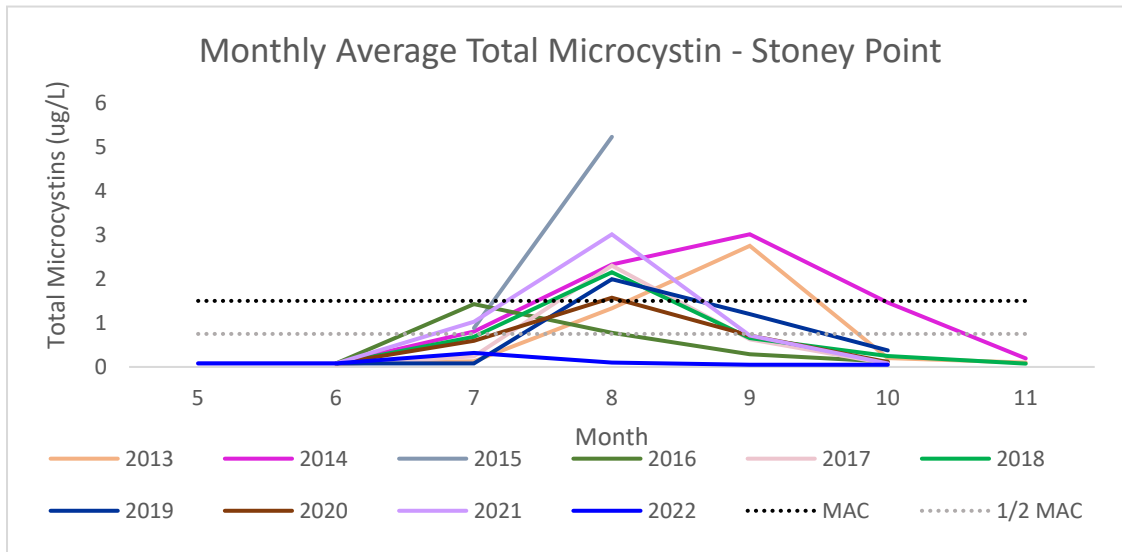


Figure 2 – Monthly average concentration of total microcystins in the raw water at the Stoney Point drinking water intake from 2013-2021.

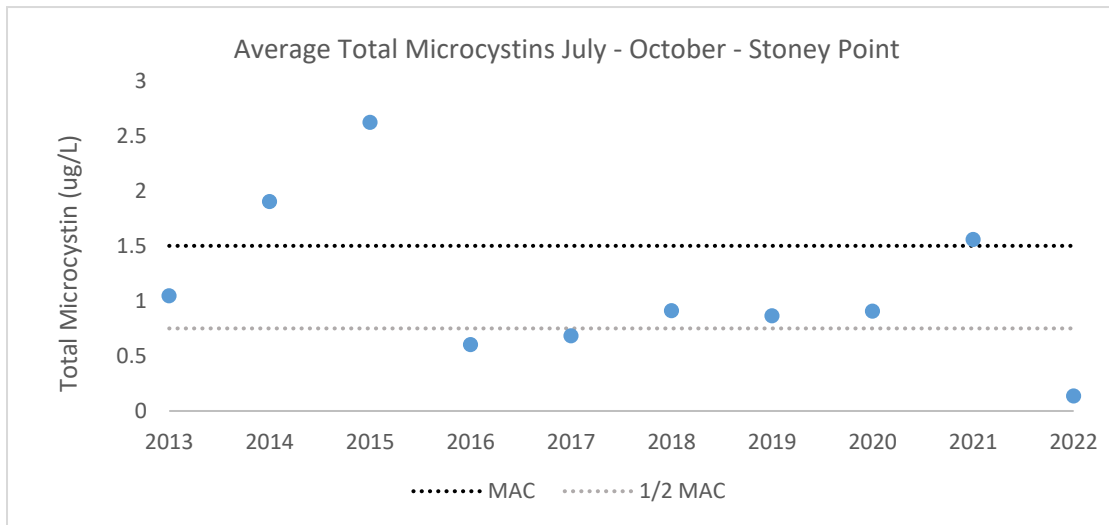


Figure 3 – Annual average concentration of total microcystins in the raw water at the Stoney Point drinking water intake from 2013-2021.

**2015 only has data for July and August when concentrations were high

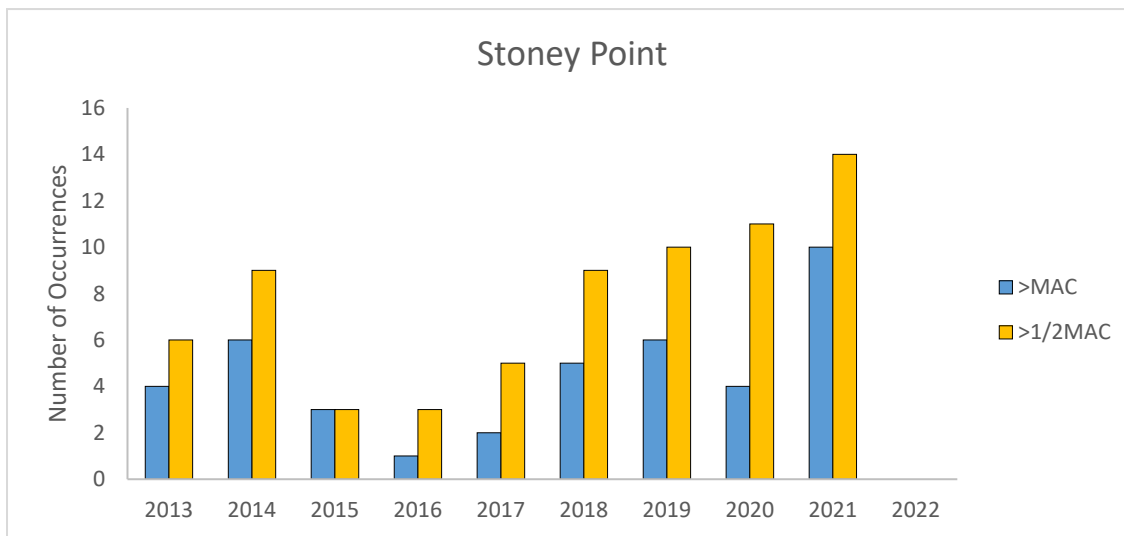


Figure 4 – The total number of occurrences when total microcystins concentration was above MAC or 1/2 MAC each year at the Stoney Point drinking water intake. Note that the number of occurrences >1/2 MAC includes the number of occurrences >MAC. There were no occurrences in 2022.

Summary:

The graphs show the seasonal nature with high total microcystins concentration during the summer months each year, which coincides with the timing of harmful algal blooms in Lake St.Clair. The graphs also show the variability and unpredictability in the toxicity of the bloom each year, and that total microcystins concentration is frequently above the threshold to be considered a drinking water issue.

- Concentration of total microcystin is frequently at or above half maximum allowable concentration (1/2 MAC)
- Concentration of total microcystin is frequently at or above maximum allowable concentration (MAC)
- There is no trend in the annual concentration of total microcystin, but rather there is high variability depending on annual conditions
- Elevated concentration of total microcystin occurs annually and persists throughout the summer months
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB.
- The drinking water operator considers microcystin to be an operational concern

Decision:

The Essex Region SPC determined that microcystin should be considered a drinking water issue for the Stoney Point drinking water intake at their meeting on October 13, 2021 under 'Option 2' - the issue is identified under the CWA ONLY (Rule 115.1).

Belle River

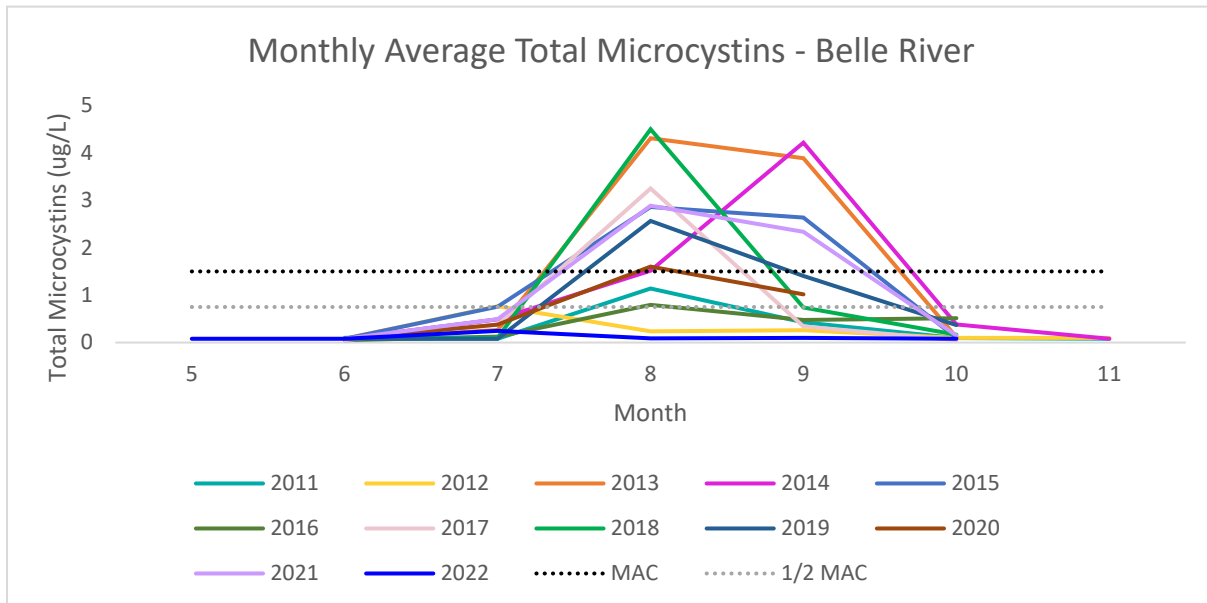


Figure 5 – Monthly average concentration of total microcystins in the raw water at the Belle River drinking water intake from 2011-2022.

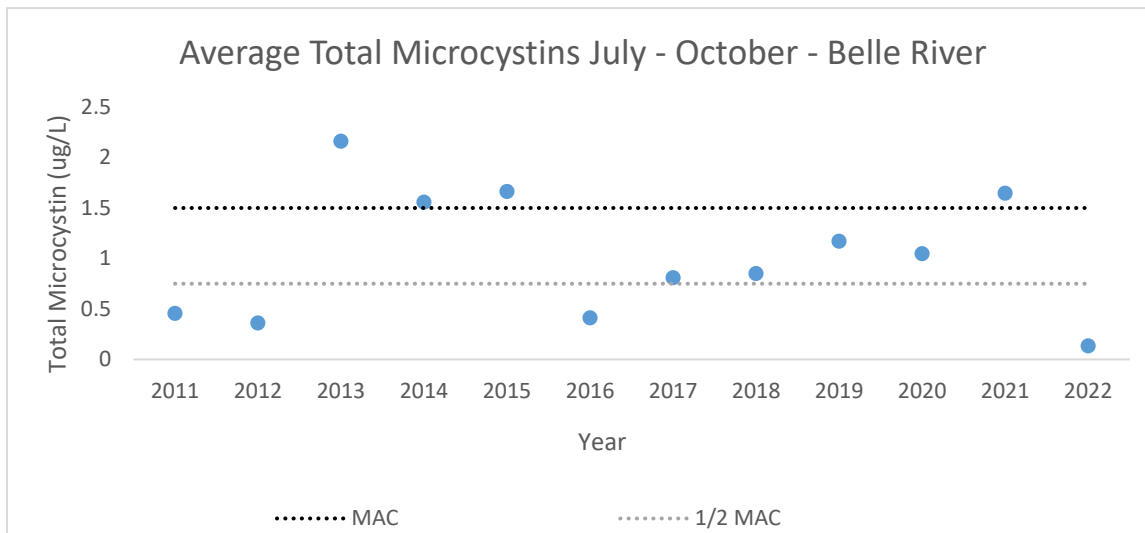


Figure 6 – Annual average concentration of total microcystins in the raw water at the Belle River drinking water intake from 2011-2021.

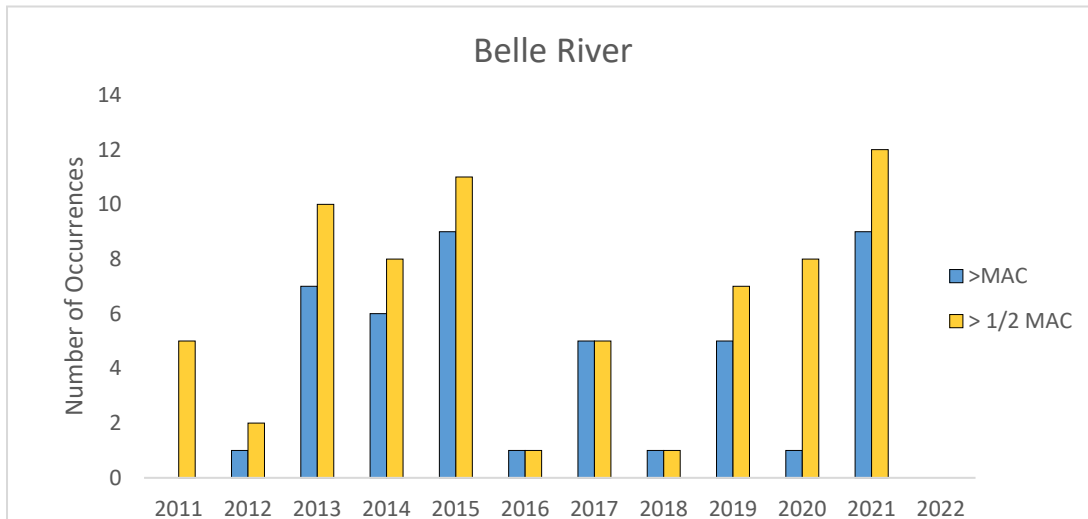


Figure 7 – The total number of occurrences when total microcystins concentration was above MAC or ½ MAC each year at the Belle River drinking water intake. Note that the number of occurrences >½ MAC includes the number of occurrences >MAC. There were no occurrences in 2022.

Summary:

The graphs show the seasonal nature with high total microcystins concentration during the summer months each year, which coincides with the timing of HABs in Lake St.Clair. The graphs also show the variability and unpredictability in the toxicity of the bloom each year, and that total microcystins concentration is frequently above the threshold to be considered a drinking water issue.

- Concentration of total microcystin is frequently at or above half maximum allowable concentration (½ MAC)
- Concentration of total microcystin is frequently at or above maximum allowable concentration (MAC)
- There is no trend in the annual concentration of total microcystin, but rather there is high variability depending on annual conditions
- Elevated concentration of total microcystin occurs annually and persists throughout the summer months
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB.
- The drinking water operator considers microcystin to be an operational concern

Decision:

The Essex Region SPC determined that microcystin should be considered a drinking water issue for the Belle River drinking water intake at their meeting on October 13, 2021 under 'Option 2' - the issue is identified under the CWA ONLY (Rule 115.1).

Detroit River

The Detroit River itself does not experience harmful algal blooms because the water is fast flowing and the environment is not conducive to algal growth. However, the drinking water intakes in the Detroit River are downstream of Lake St.Clair, which does experience toxin producing harmful algal blooms each year. As such, they are also required to monitor for microcystin in the raw water.

Windsor – A.H. Weeks drinking water intake

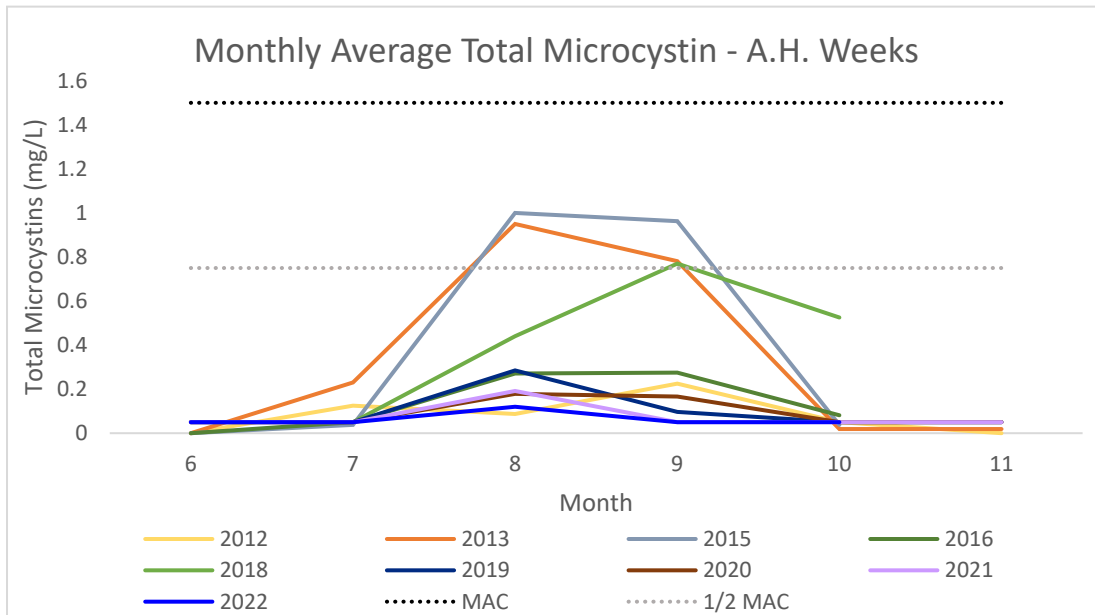


Figure 8 – Monthly average concentration of total microcystins in the raw water at the A.H. Weeks drinking water intake from 2012-2022.

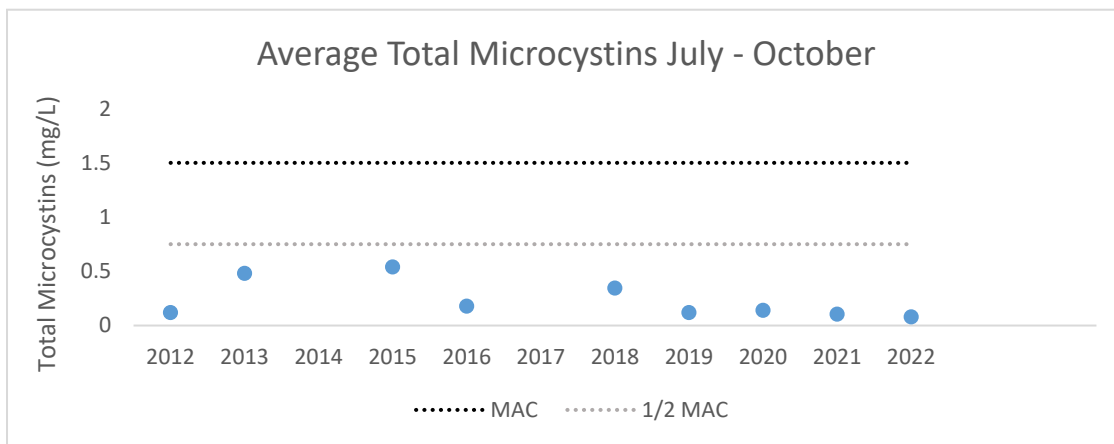


Figure 9 – Annual average concentration of total microcystins in the raw water at the A.H. Weeks drinking water intake from 2012-2022.

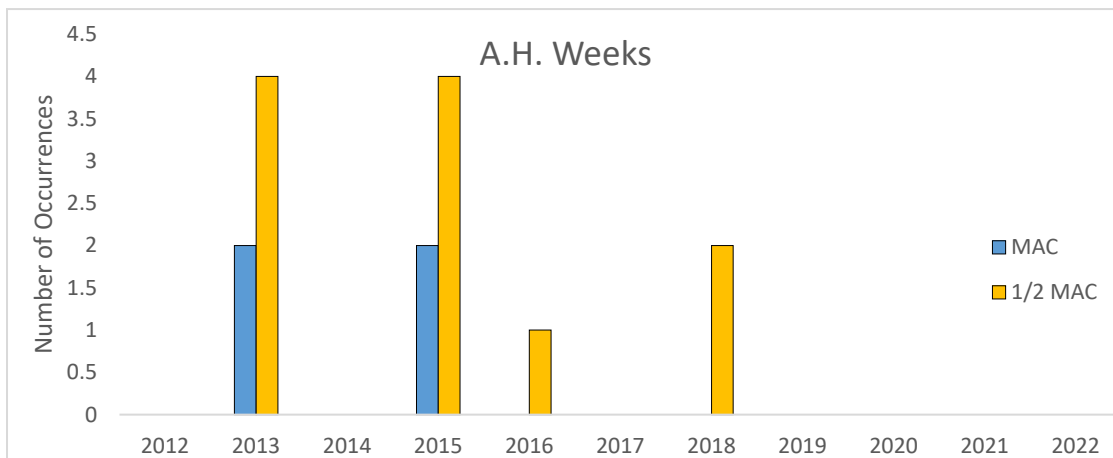


Figure 10 – The total number of occurrences when total microcystins concentration was above MAC or 1/2 MAC each year at the A.H. Weeks drinking water intake. Note that the number of occurrences >1/2 MAC includes the number of occurrences >MAC. There were no occurrences in 2012 or between 2019 and 2022 and there were no data collected in 2014 and 2017.

Summary:

Average monthly total microcystins concentration is typically below the 1/2 MAC with concentrations between the 1/2 MAC and MAC in 2013 and 2015 only, and no average concentration above the MAC. However, the seasonal nature is still clear with higher concentrations during the summer months each year, which coincides with the timing of harmful algal blooms in Lake St.Clair. The number of individual occurrences above the MAC and 1/2 MAC was also low in all years for this intake, with no occurrences above either benchmark between 2019 and 2022.

- Concentration of total microcystin is sometimes at or above half maximum allowable concentration (1/2 MAC)
- Concentration of total microcystin is rarely seen at or above maximum allowable concentration (MAC)
- There is no trend in the annual concentration of total microcystin, but rather there is high variability depending on annual conditions
- Elevated concentration of total microcystin occurs annually and display a seasonal pattern
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB.
- The drinking water operator considers microcystin to be an operational concern

Decision:

To be determined by the SPC at their September 13, 2023 meeting.

Amherstburg

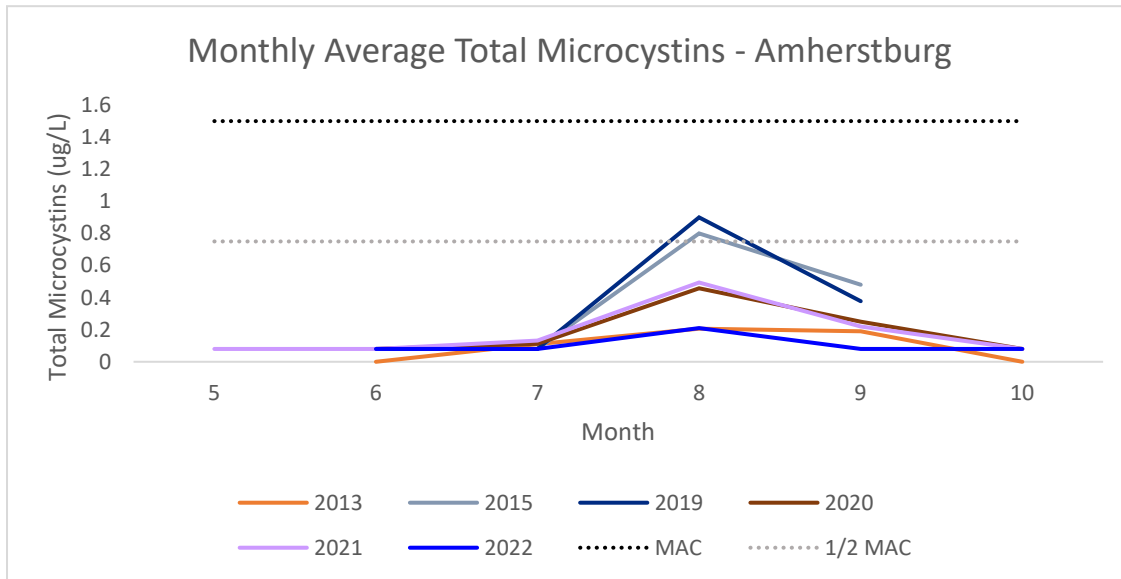


Figure 11 – Monthly average concentration of total microcystins in the raw water at the Amherstburg drinking water intake from 2013-2022 using all available data.

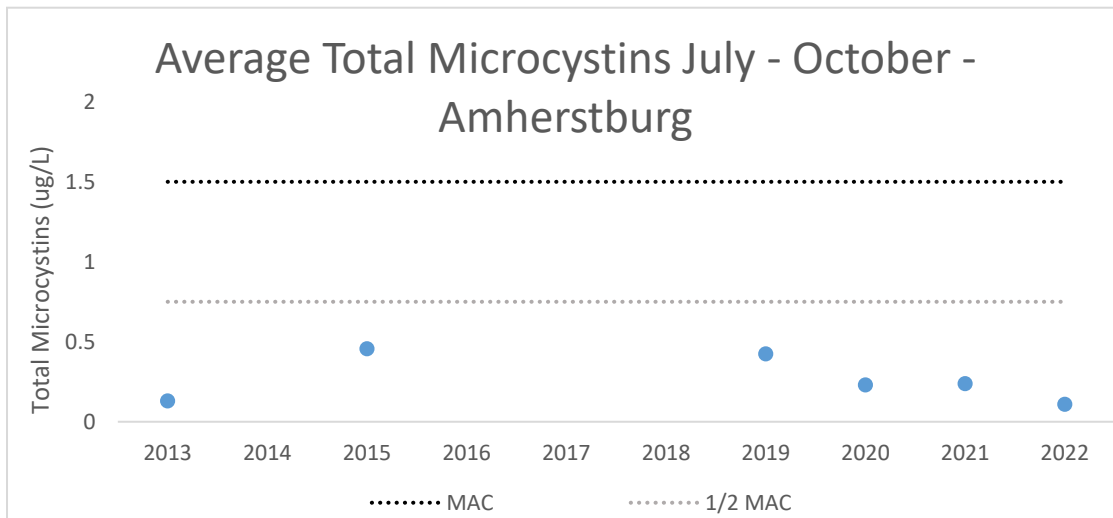


Figure 12 – Annual average concentration of total microcystins in the raw water at the Amherstburg drinking water intake from 2013-2022 using all available data.

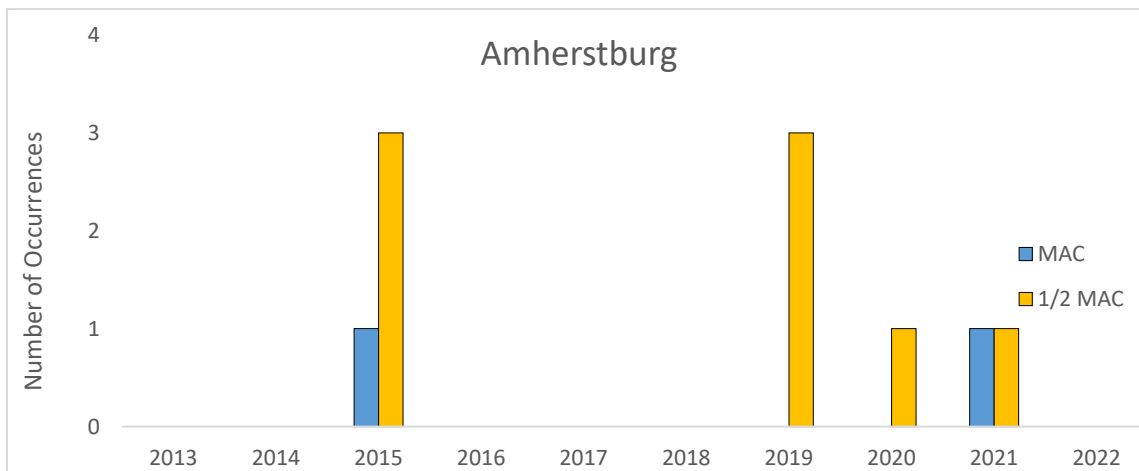


Figure 13 – The total number of occurrences when total microcystins concentration was above MAC or ½ MAC each year at the Amherstburg drinking water intake. Note that the number of occurrences >½ MAC includes the number of occurrences >MAC. There were no occurrences in 2013 and 2022 and there were no data collected in 2014, and 2016-2018.

Summary:

Average monthly total microcystin concentration is typically below the ½ MAC with concentrations between the ½ MAC and MAC in 2015 and 2019 only, and no average concentration above the MAC. However, the seasonal nature is still clear with higher concentrations during the summer months each year, which coincides with the timing of harmful algal blooms in Lake St.Clair. The number of individual occurrences above the MAC and ½ MAC was also low in all years for this intake.

- Concentration of total microcystin is sometimes at or above half maximum allowable concentration (½ MAC)
- Concentration of total microcystin is rarely seen at or above maximum allowable concentration (MAC)
- There are insufficient data to conduct trend analysis due to several years of missing data prior to 2019
- Elevated concentration of total microcystin occurs annually and display a seasonal pattern
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB.
- The drinking water operator considers microcystin to be an operational concern

Decision:

To be determined by the SPC at their September 13, 2023 meeting.

Lake Erie

Harrow-Colchester

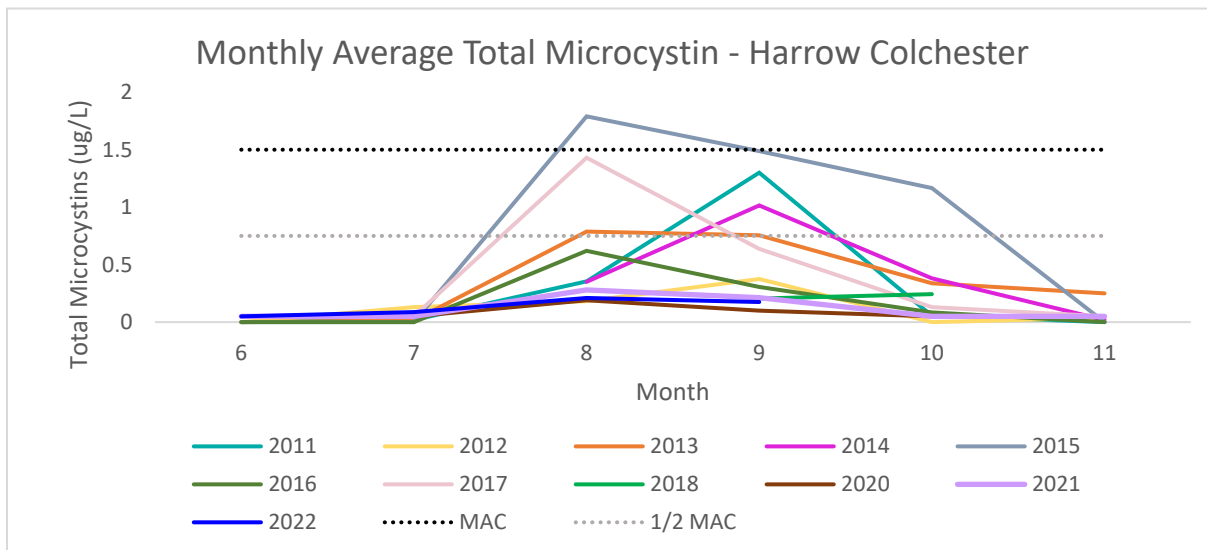


Figure 14 – Monthly average concentration of total microcystins in the raw water at the Harrow-Colchester drinking water intake from 2011-2022

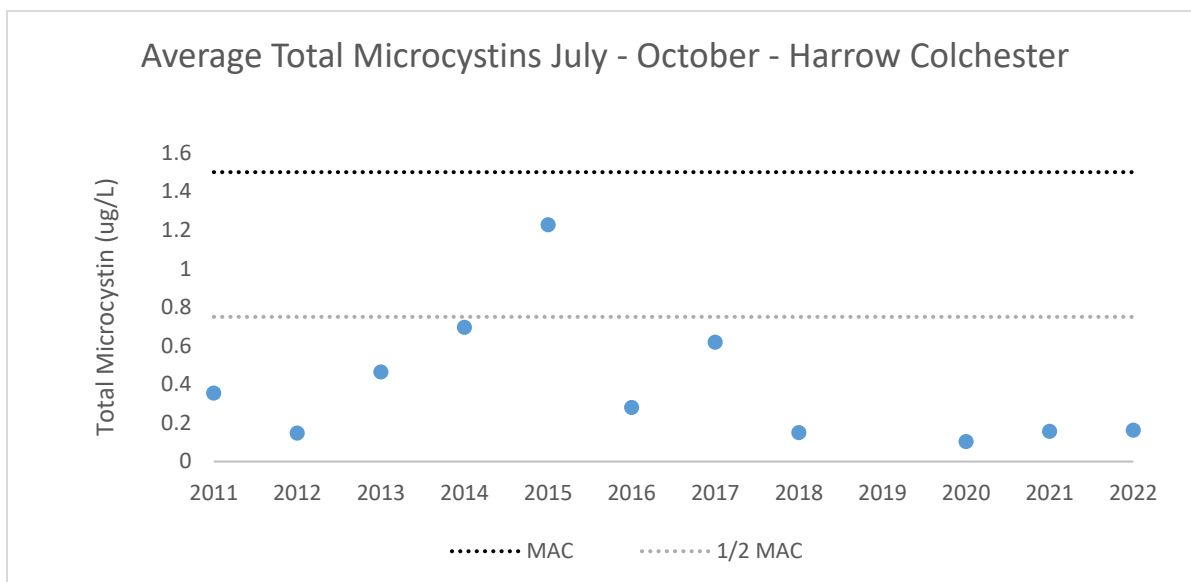


Figure 15 – Annual average concentration of total microcystins in the raw water at the Harrow-Colchester drinking water intake from 2011-2022

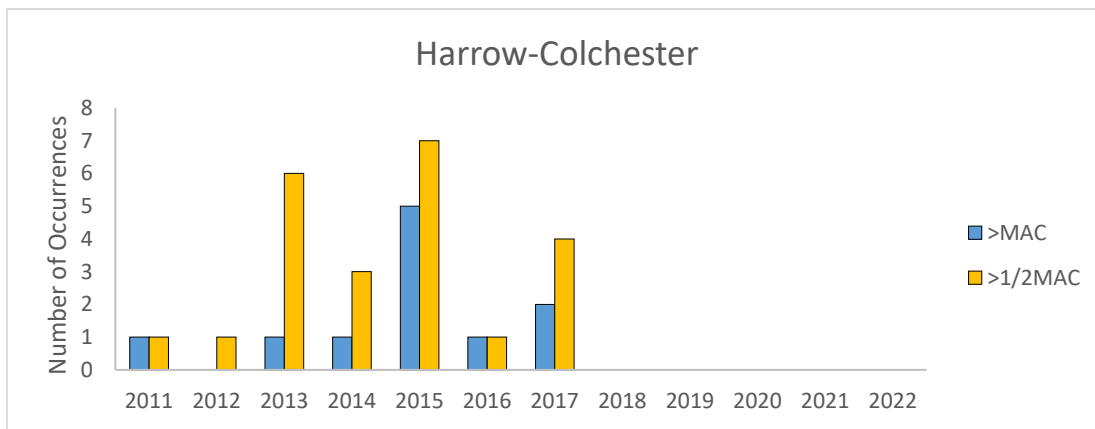


Figure 16 – The total number of occurrences when total microcystins concentration was above MAC or 1/2 MAC each year at the Harrow-Colchester drinking water intake. Note that the number of occurrences >1/2 MAC includes the number of occurrences >MAC. There were no occurrences between 2018 and 2022.

Summary:

Average monthly total microcystin concentration is typically below the 1/2 MAC with average concentrations between the 1/2 MAC and MAC in 2011, 2013, 2014 and 2015. Importantly, since 2018 there have been no concentrations above the 1/2 MAC. There are two factors that should be considered – there was a change in the laboratory conducting the analysis in 2019, and Lake Erie has experienced less severe blooms in recent years. With these two confounding factors, it is difficult to say with certainty whether this is a data artifact or a true representation of conditions, however, visual and satellite observations provide support that concentrations likely were truly lower in recent years. Even though concentrations are lower in recent years, there is still a seasonal pattern and it is necessary for the WTP operator to monitor conditions.

- Concentration of total microcystin has been frequently seen at or above half maximum allowable concentration (1/2 MAC), although not in recent years
- Concentration of total microcystin has been regularly seen at or above maximum allowable concentration (MAC), although not in recent years
- There is no trend in the annual concentration of total microcystin, but rather there is high variability depending on annual conditions
- Elevated concentration of total microcystin occurs annually and display a seasonal pattern
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB.
- The drinking water operator considers microcystin to be an operational concern

Decision:

The SPC determined that microcystin was a drinking water issue at this intake based on analysis conducted in 2014. A re-evaluation is to be conducted by the SPC at their September 13, 2023 meeting.

Union

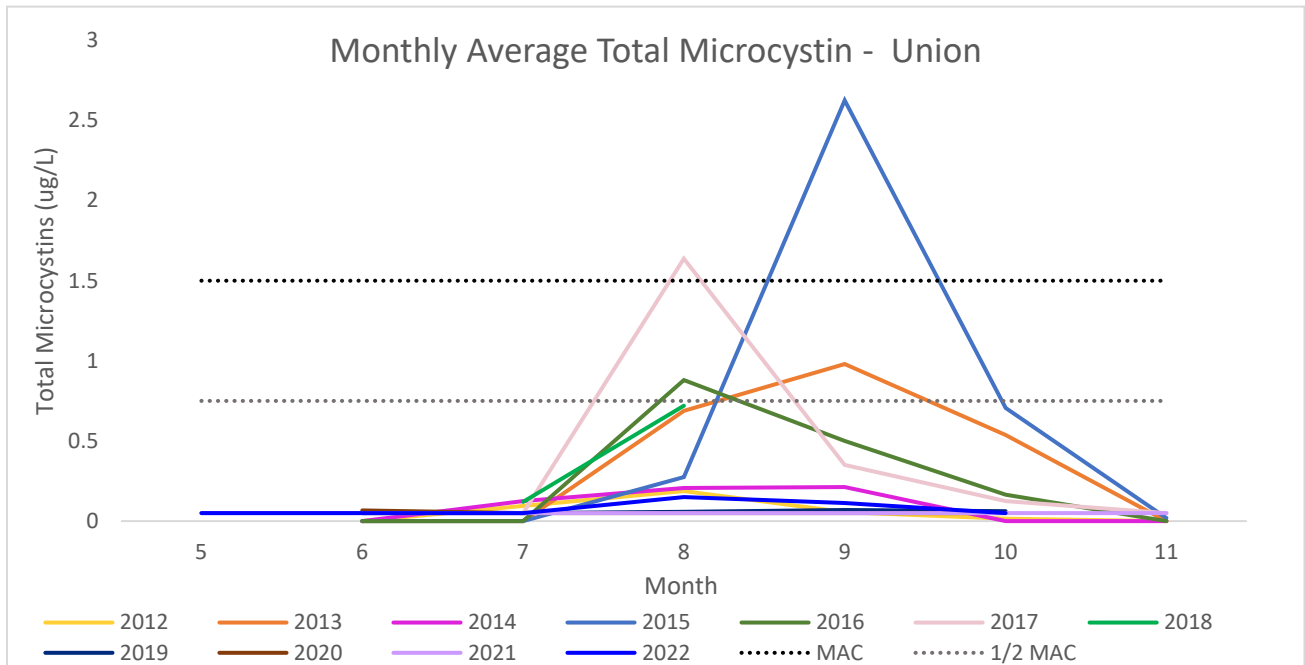


Figure 17 – Monthly average concentration of total microcystins in the raw water at the Union drinking water intake from 2012-2022

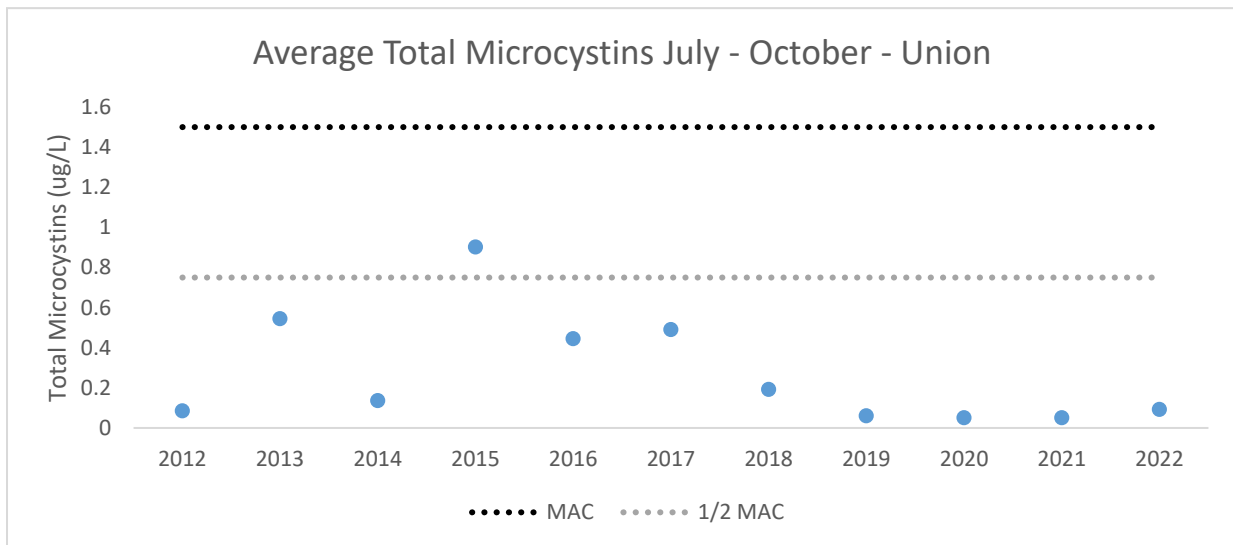


Figure 18 – Annual average concentration of total microcystins in the raw water at the Union drinking water intake from 2012-2022

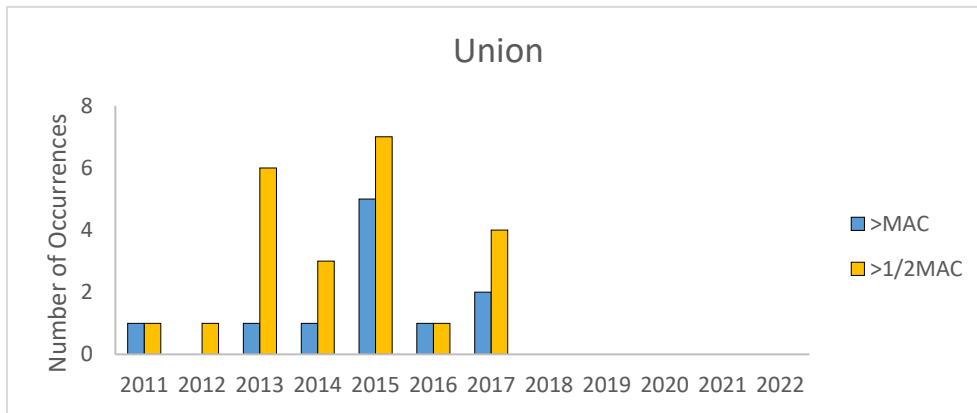


Figure 19 – The total number of occurrences when total microcystins concentration was above MAC or ½ MAC each year at the Union drinking water intake. Note that the number of occurrences >½ MAC includes the number of occurrences >MAC. There were no occurrences between 2018 and 2022.

Summary:

Average monthly total microcystin concentration is typically below the ½ MAC with average concentrations between the ½ MAC and MAC in 2013, and 2015-2017. Importantly, since 2018 there have been no concentrations above the ½ MAC. There are two factors that should be considered – there was a change in the laboratory conducting the analysis in 2019, and Lake Erie has experienced less severe blooms in recent years.

The concern with the change in labs is illustrated by the graph below (Figure 20), which shows data reportedly from the same location collecting source water at the Union drinking water intake. Sampling dates are within 1 to 2 days of each other, but analysis is run either by the MECP through the DWSP program (orange line) or by a private lab (blue line). The difference between the data from nearby dates ranges from -0.17 to 4.85ug/L, with an average difference of 0.80ug/L.

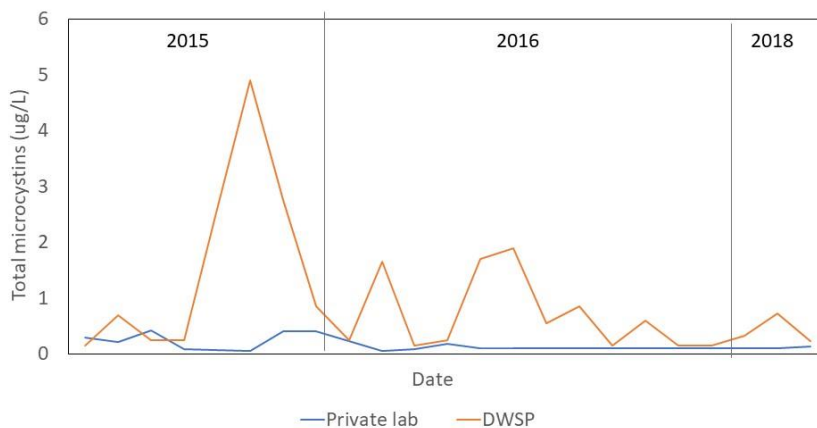


Figure 20 – Comparison of total microcystin concentration in the raw water at Union drinking water intake between the MECP lab through the DWSP program and a private lab. Dates for each pair of data are within 1 to 2 days of each other.

With these two confounding factors, it is difficult to say with certainty whether this is a data artifact or a true representation of conditions, however, visual and satellite observations provide support that concentrations were likely to be truly lower in recent years. Even though concentrations are lower in recent years, there is still a seasonal pattern and it is necessary for the WTP operator to monitor conditions.

- Concentration of total microcystin has been regularly seen at or above half maximum allowable concentration ($\frac{1}{2}$ MAC), although not in recent years
- Concentration of total microcystin been regularly seen at or above maximum allowable concentration (MAC), although not in recent years
- There is no trend in the annual concentration of total microcystin, but rather this is high variability depending on annual conditions
- Elevated concentration of total microcystin occurs annually and display a seasonal pattern
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB. The WTP has recently added treatment steps for redundancy
- The drinking water operator considers microcystin to be an operational concern

Decision:

The SPC determined that microcystin was a drinking water issue at this intake based on analysis conducted in 2014. A re-evaluation is to be conducted by the SPC at their September 13, 2023 meeting.

Pelee Island West Shore

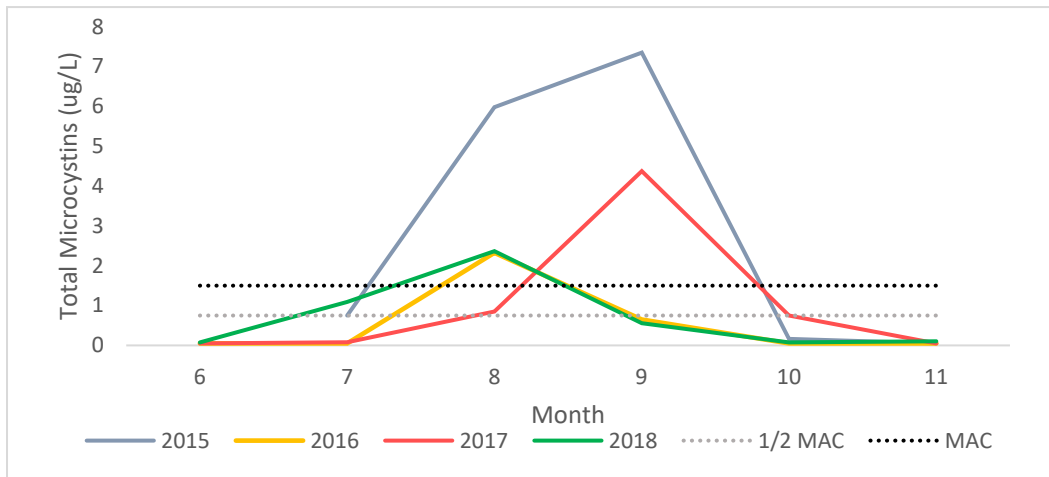


Figure 21 – Monthly average concentration of total microcystins in the raw water at the Pelee Island West Shore drinking water intake from 2015-2018

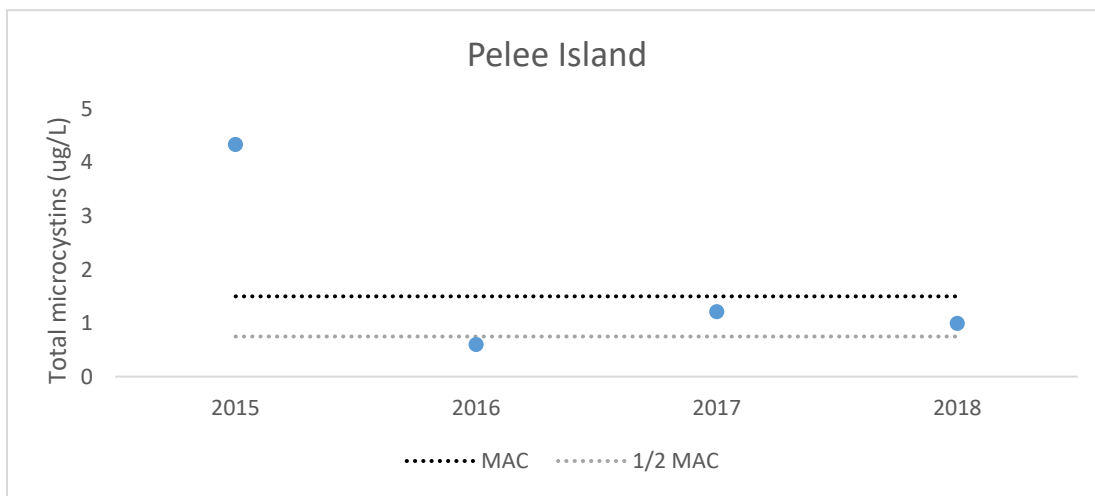


Figure 22 – Annual average concentration of total microcystins in the raw water at the Pelee Island West Shore drinking water intake from 2015-2018

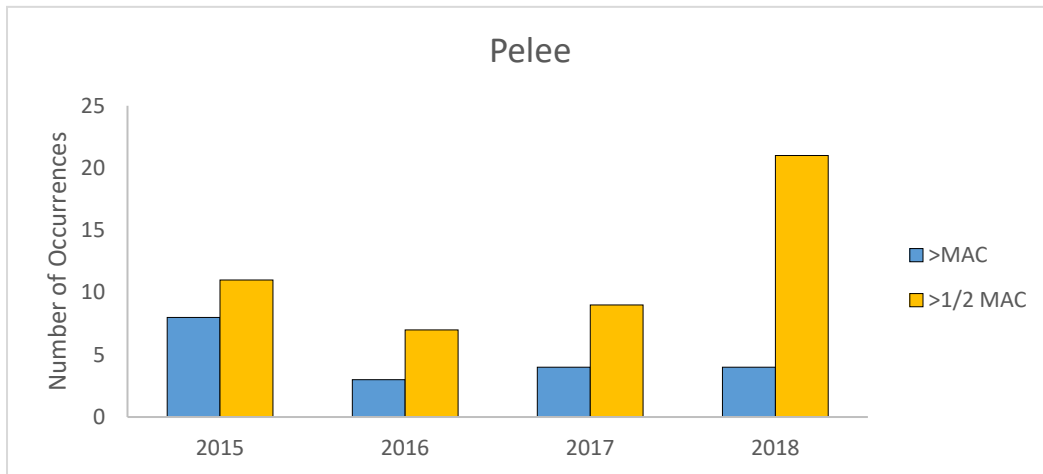


Figure 23 – The total number of occurrences when total microcystins concentration was above MAC or 1/2 MAC each year at the Pelee Island West Shore drinking water intake. Note that the number of occurrences >1/2 MAC includes the number of occurrences >MAC. There were no occurrences between 2018 and 2022.

Summary:

Average monthly total microcystin concentration during a HAB is often above the 1/2 MAC, with some monthly averages exceeding the MAC. The seasonal nature is clear with high concentrations during the summer months each year, which coincides with the timing of harmful algal blooms in Lake Erie. The number of individual occurrences above the MAC and 1/2 MAC was very high in all years with data for this intake.

Importantly, there are only data for 2015-2018 for the source water at this intake. During this time, the drinking water operator was taking samples directly from Lake Erie near the intake and from an access point within the WTP. While no treatment processes occur between these two points, water does pass through a natural sand filter. The operator at that time observed that total microcystin concentration was generally below detection at the access point, regardless of conditions in Lake Erie. This is confirmed by the data, which were collected on the same date by the same operator and analyzed at the same lab by the MECP (Figure 24). Research was recently completed at the University of Windsor to examine this phenomenon. It has been confirmed that a unique microbial community resides in the sand. The microbial community, through exposure to extremely high concentrations of microcystins, has developed a mutualistic, community-scale metabolic pathway by which microcystins are broken down (Salter, in prep). After 2018, analysis of total microcystins became the responsibility of the municipalities and was no longer included as part of DWSP. From 2019 onward, samples were only collected at the access point within the WTP, which is not representative of conditions in the source water. This was brought to the attention of the MECP and Township of Pelee in 2023. A thorough search for nearby data was conducted through consultation with research in both Canada and the US. Unfortunately, there are no supporting total microcystins data in the vicinity of Pelee Island between 2019 and 2022. An alternative method would be to examine satellite imagery in that

time frame, but that is beyond the scope of this report and satellite imagery cannot reliably be used at this time to estimate bloom toxicity.

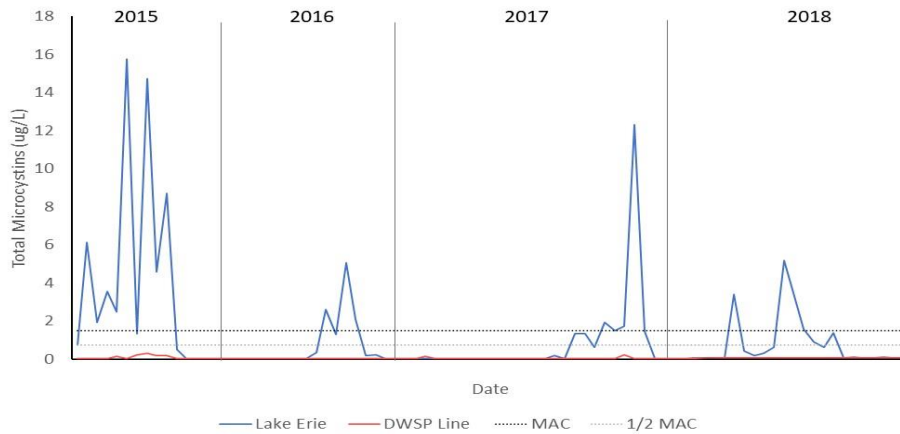


Figure 24 – Total microcystin concentration in Lake Erie (blue line) near the Pelee Island West Shore WTP and inside the same WTP after water has passed through a natural sand filter (red line). Samples were collected on the same day, but the same operator and analyzed by the same laboratory.

- Concentration of total microcystin is frequently at or above half maximum allowable concentration ($\frac{1}{2}$ MAC)
- Concentration of total microcystin is frequently at or above maximum allowable concentration (MAC)
- There are insufficient data to conduct trend analysis due to several years of missing data after 2018
- Elevated concentration of total microcystin occurs annually and display a seasonal pattern
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB. The WTP underwent significant upgrades in 2015.
- The drinking water operator considers microcystin to be an operational concern

Decision:

The SPC determined that microcystin was a drinking water issue at this intake based on analysis conducted in 2014. A re-evaluation is to be conducted by the SPC at their September 13, 2023 meeting.

Summary and Conclusion

To be written

References

Environment and Climate Change Canada (ECCC) and the Ministry of the Environment Conservation and Parks (MECP). 2018. Canada-Ontario Lake Erie Action Plan. Available online: <https://www.canada.ca/en/environment-climate-change/services/great-lakes-protection/action-plan-reduce-phosphorus-lake-erie.html>

ERCA, 2003. Expanding greenhouse sector in Essex County, ON and downstream water quality degradation. Kingsville Leamington Nutrient Project 2012-2022. Available online: <https://essexregionconservation.ca/watershed-health/water-quality/>

Maccoux, M. Dove, A., Backus, S.M. and Dolan, D.M. 2016. Total and soluble reactive phosphorus loadings to Lake Erie: A detailed accounting by year, basin, country, and tributary.

Salter, C. In Prep. Elucidating Microbial Mechanisms of Microcystin-LR in Lake Erie Beach Sand through Metabolomics and Metatranscriptomics.

Schindler, D. W. 1977. Evolution of phosphorus limitation in lakes. *Science*, 195(4275), 260-262.

Drinking water issue – Microcystin-LR

All Drinking Water Intakes in the Essex Region

Risk Level: N/A

Approach: N/A

Policy Tool: Clean Water Act, Section 22(7) - Education & Outreach

Implementing Body: Essex Region Conservation Authority to be the lead

Legal Effect: Non-legally binding (Strategic Action)

Compliance Date: Within two years after the Plan or its amendments take effect

Significant Risk Circumstance:

N/A

Policy Text:

The Essex Region Conservation Authority will initiate and lead Education and Outreach by building on existing Education and Outreach programs to promote best management practices targeted at nutrient reduction from a variety of sources. The entire Essex Region Source Protection Area will be included in the E&O program. The program will target activities that may release phosphorus, which contributes to algal growth and the production of microcystins-LR, such as (application, storage and management of fertilizer, manure and sewage)

Targeted programs may include:

- Promoting agricultural best management practices (BMPs) to reduce nutrient loss (e.g. 4R nutrient strategy, cover crops, buffer strips, etc.), with specific focus on the greenhouse sector
- Promoting voluntary nutrient management plans for farms that do not qualify under O. Reg. 267/03 and who land apply commercial fertilizers.
- Promoting BMPs for the application, storage and handling of commercial fertilizer in areas where it is or could be a significant drinking water threat.
- Incorporating general information into existing Education and Outreach programs and taking opportunities to provide programming to a diverse audience (e.g. agricultural, public interest groups, youth, life-long learners, etc.) through a variety of media (e.g. in person, social media, written articles, recorded interviews, etc.)
- Timely reporting on related monitoring and research in the Essex Region

ERCA will continue to provide E&O that has already been developed and will refine and expand on the material as new information becomes available. Implementation will be conditional on availability of funding.

Drinking water issue – Microcystin-LR

All Drinking Water Intakes and tributaries in the Essex Region

Risk Level: N/A

Approach: N/A

Policy Tool: Clean Water Act, Section 22(7) - Monitoring

Implementing Body: All municipalities in the Essex Region, ERCA, MECP

Legal Effect: Non-legally binding (Strategic Action)

Compliance Date: When the Plan or its amendments take effect

Significant Risk Circumstance:

N/A

Policy Text:

In accordance with Section 22(2)-[7] of the Clean Water Act, further monitoring and research of microcystin-LR and phosphorus is required for all drinking water intakes and tributaries in the Essex Region.

All drinking water treatment plants in the Essex Region (Stoney Point, Belle River, A.H. Weeks, Amherstburg, Harrow-Colchester, Union, Pelee West Shore and Wheatley) shall continue to conduct existing water quality sampling (both raw and treated water) and to share information and data with other interested parties where resources are available. The Ministry of the Environment, Conservation and Parks should assist municipal and operating authorities with this monitoring program to ensure a consistent and reliable source of information.

Essex Region Conservation Authority, in collaboration with the Province (MECP), and other bodies (e.g. Lower Thames Valley Conservation Authority, Environment Canada, research institutions) where possible, should continue the support of existing water quality monitoring programs (e.g. DWSP, PWQMN and research projects) where they relate to the assessment and understanding of microcystin-LR as a drinking water issue and/or phosphorus as a contributor to algal growth. Where it is appropriate, additional water quality monitoring should be incorporated into existing programs or developed as new programs.

Municipalities with combined sewer overflows should continue to monitor these events.

Participation in these monitoring programs is dependent on adequate resources (including funding and staff capacity) being available.



Essex Region Source Protection Committee

Report 07/23

From: Katie Stammler, Source Water Project Manager

Date: Friday, August 11, 2023

Subject: S.36 Update – Dense non-aqueous phase liquids (DNAPLs) – new policies

Recommendation

THAT the SPC approve the attached amended policies to be submitted to the MECP for early engagement

Summary

- The Table of Drinking Water Threats was updated in 2021
- The Handling and Storage of Dense Non-aqueous Liquids (DNAPLs) was previously only a SDWT in IPZ's with score of 10, in the 2021 Director Technical Rules, the vulnerability score was lowered to 9, making it a SDWT for Lakeshore IPZ-1, Windsor IPZ-1 and Amherstburg IPZ-1
- New policies are required in the Essex Region Source Protection Plan and will be included in the comprehensive s.36 update

Discussion

Dense non-aqueous phase liquids (DNAPLs) are heavier-than water organic liquids that are only slightly soluble in water, which means that they do not mix with either water or air but rather remain as a separate fluid (like oil and water). This makes them more likely to result in long term contamination and difficult to remediate because a spill will sink. They are also very toxic to humans and the environment even at low levels. Common types of DNAPLs include timber treating oils such as creosote, transformer and insulating oils containing polychlorinated biphenyls (PCBs), coal tar, and a variety of chlorinated solvents such as trichloroethene (TCE) and tetrachloroethene (PCE). For more information on DNAPLs, see SPC Report 03/23.

The handling and storage (at, above or partially below grade) of DNAPLs is now considered to be a Significant Drinking Water Threat in IPZ's with vulnerability score of 9 or higher, which includes Lakeshore IPZ-1, Windsor IPZ-1 and Amherstburg IPZ-1.

Given that this activity is a SDWT, the Source Protection Plan must include policies that ensure that the activity ceases to be or never becomes a threat to our sources of drinking water. While this is a new threat circumstance for the Essex Region, most other Source Protection Areas (SPAs) already have policies to protect groundwater sources of drinking water from DNAPL spills. ERSPA staff initiated and collected responses from other SPAs through an online survey to inform the development of the attached proposed policies for the Essex Region. Responses were received from ten SPAs, including ERSPA. Most respondents indicated having some difficulty with implementing their current policies for a variety of reasons including:

- Identifying what is and is not a DNAPL; Low confidence that all DNAPL threats were captured (the new List 1 in the 2021 DTR will help with that)
- Hard to prohibit DNAPL as there is no flag for change in ownership / operation.
- The DTR does not provide quantity limits, SPCs either had to determine a volume threshold or include DNAPLs of any quantity
- Difficult to get cooperation with existing businesses that have been handling and storing DNAPLs for many years. Some RMPs had to be issued by Order
- Hard to measure effectiveness of E&O activities
- E&O has been either specific to threat activity or Source Water but rarely both

There were also many possible solutions provided that were considered in the development of the attached proposed policies:

- Changing s.57 policies to s.58 in some areas
- Exempting retail establishments
- Adding in volume threshold (25L or 250L)

Based on this information and discussion with the SPC at their meeting on 8 February, 2023, ERSPA are proposing three new policies to address DNAPLs as a SDWT.

Policy 1

This policy uses s.58 to require Risk Management Plans for the handling and storage of DNAPL in any quantity (excluding incidental quantities for personal/domestic use, which is typically <25 litres).

Policy 2

This policy uses s.22(7) to require municipalities to deliver Education and Outreach material prepared in collaboration with the Conservation Authority and/or other bodies in areas where the handling and storage of DNAPL is a significant drinking water threat/

Policy 3

This policy uses s.22(7) – Specify Action to require the Town of Lakeshore to display and distribute Education and Outreach material produced under the above policy at the Belle River Marina in Lakeshore IPZ-1 where the handling and storage of DNAPLs as it pertains to boat use and maintenance may be prevalent.

These draft policies are presented to the SPC for discussion and approval. These policies will then be provided to the MECP for review through the Early Engagement process as well as to municipalities for comment prior to formal public consultation.

RECOMMENDATION

THAT the SPC approve the attached amended policies to be submitted to the MECP for early engagement



Katie Stammler, PhD
Project Manager, Source Water Protection/
Water Quality Scientist

Attachment: Draft DNAPL policies

16.0 The handling and storage of a dense non-aqueous phase liquid

Chemical

Existing and/or Future Activities

Windsor IPZ-1, Lakeshore IPZ-1 and Amherstburg IPZ-1
IPZs with vulnerability score ≥ 9

Risk Level: Significant

Approach: Manage

Policy Tool: Clean Water Act, Section 58 Risk Management Plan

Implementing Body: RMO/I

Legal Effect: Must conform/comply with

Compliance Date:

For future threats - when the Source Protection Plan or its amendments take effect.

For existing threats - within 5 years from the date the plan or its amendments take effect.

Significant Risk Circumstance:

1. The engagement of an activity that may include, but not limited to, those provided in List 1 of Section 9 of the Glossary of Terms in the Table of Drinking Water Threats.
2. Storage of a DNAPL at, above or partially below grade.

Policy Text:

The Risk Management Official shall enact applicable sections under Part IV of the Clean Water Act to establish a Risk Management Plan (RMP) for the handling and storage of DNAPL in any quantity (excluding incidental quantities for personal/domestic use, which is typically <25 litres). The RMP will contain risk management measures that ensure the activity ceases to be or never becomes a threat to sources of drinking water.

The Risk Management Plan may include, but is not limited to, details concerning how and where DNAPLs are stored and contained, and appropriate actions to take in the event of a spill. The Risk Management Official will have discretion as to what constitutes a satisfactory Risk Management Plan. The Risk Management Official may require consultation with a qualified person to ensure the Risk Management Plan meets the intent of any other application Regulation.

16.0 The handling and storage of a dense non-aqueous phase liquid

Chemical

Existing and/or Future Activities

Windsor IPZ-1, Lakeshore IPZ-1 and Amherstburg IPZ-1
IPZs with vulnerability score ≥ 9

Risk Level: Significant

Approach: Manage

Policy Tool: Clean Water Act, Section 22(7) - Education & Outreach

Implementing Body: ERCA, municipalities

Legal Effect: Must conform/comply with

Compliance Date:

Within 2 years from the date the plan or its amendments take effect.

Significant Risk Circumstance:

1. The engagement of an activity that may include, but not limited to, those provided in List 1 of Section 9 of the Glossary of Terms in the Table of Drinking Water Threats.
2. Storage of a DNAPL at, above or partially below grade.

Policy Text:

The Municipalities shall deliver Education and Outreach material prepared in collaboration with the Conservation Authority and/or other bodies in areas where the handling and storage of DNAPL is a significant drinking water threat. The materials will be delivered to all landowners where the handling and storage of DNAPL is a significant drinking water threat. The program should include, but not be limited to, informing users of proper handling and disposal of such chemicals including manufactured products containing them, the risks posed to source water, and how to recognize and respond to a spill. The material will also outline the circumstances under which a s.58 Risk Management Plan would be required. Further, the program shall be made available on an ongoing basis and updated as is deemed appropriate.

16.0 The handling and storage of a dense non-aqueous phase liquid

Chemical

Existing and/or Future Activities

Lakeshore IPZ-1

Risk Level: Significant

Approach: Manage

Policy Tool: Clean Water Act O.Reg. 287/07 Section 26 (1.v.) - Specify Action to be taken to implement Plan or achieve its objectives

Implementing Body: Town of Lakeshore

Legal Effect: Must conform/comply with

Compliance Date:

Within 2 years from the date the plan or its amendments take effect.

Significant Risk Circumstance:

1. The engagement of an activity that may include, but not limited to, those provided in List 1 of Section 9 of the Glossary of Terms in the Table of Drinking Water Threats.
2. Storage of a DNAPL at, above or partially below grade.

Policy Text:

The Town of Lakeshore shall display Education and Outreach material produced under **policy** at the Belle River Marina in Lakeshore IPZ-1 where the handling and storage of DNAPLs as it pertains to boat use and maintenance may be prevalent. Further, the Town of Lakeshore shall provide copies of the Education and Outreach material to all existing and new users of the Marina.

Rationale:

Dense non-aqueous phase liquids (DNAPLs) are heavier-than water organic liquids that are only slightly soluble in water, which means that they do not mix with either water or air but rather remain as a separate fluid (like oil and water). This makes them more likely to result in long term contamination and difficult to remediate because a spill will sink. They are also very toxic to humans and the environment even at low levels. The handling and storage (at, above or partially below grade) of DNAPLs is considered to be a Significant Drinking Water Threat in IPZ's with vulnerability score of 9 or higher, which includes Lakeshore IPZ-1, Windsor IPZ-1 and Amherstburg IPZ-1.

Given that this activity is a SDWT, the Source Protection Plan must include policies that ensure that the activity ceases to be or never becomes a threat to our sources of drinking water. There are no Prescribed Instruments for this activity so the Source Protection Committee opted to include policies using other available tools including

- Manage through s.58 (Risk Management Official)
- Education and Outreach
- Specify Action

The Committee reviewed existing policies for DNAPLs and conferred with staff at other SPA/Rs to discuss policy implementation challenges. Because there is no volume limit and the types of products that could contain DNAPLs are numerous, it was determined that a prohibition policy using s.57 of the *Clean Water Act* would be challenging to implement. The Committee followed examples from other SPA/Rs to develop a policy to require Risk Management Plans under s.58 of the *Clean Water Act* for volumes in excess of what would be considered reasonable for domestic/personal use. Most SPA/Rs use 25 L as the volume above which a RMP is required, but our policy allows for some discretion using this limit as a guide. An Education and Outreach policy is also included to inform landowners of the risks posed by DNAPLs, the circumstances under which an RMP would be required, proper storage and disposal and what to do in the event of a spill.

Lakeshore IPZ-1 is entirely occupied by a marina, which may contain many DNAPLs, likely in small quantities, but cumulatively could result in large volumes. Given the number of individuals who use the marina and that individual volumes would be below the threshold to require a RMP, a Specify Action policy is used in this area to require the Town of Lakeshore to display and deliver Education and Outreach material.

Windsor IPZ-1 is mostly park land and is almost entirely municipally owned. Amherstburg IPZ-1 is mostly residential, with a main thoroughfare (Front Road), for which road repairs might use DNAPLs. There are auto repair shops within the IPZ-1, which would contain DNAPLs.

Common types of DNAPLs include timber treating oils such as creosote, transformer and insulating oils containing polychlorinated biphenyls (PCBs), coal tar, and a variety of chlorinated solvents such as trichloroethene (TCE) and tetrachloroethene (PCE).

According to the 2021 Director Technical Rules, the following (List 1) is applicable to the circumstances related to the handling and storage of DNAPLs.

- Adhesives and resins manufacturing and processing
- Airstrips and hangars operations
- Asphalt and bitumen manufacturing
- Boat manufacturing*
- Coal gasification and coal tar manufacturing and processing
- Commercial autobody shops (including automotive and other motor vehicles)*
- Commercial port activities, including operation and maintenance of wharves and docks*
- Cosmetics manufacturing and processing
- Dye manufacturing and processing
- Electroplating
- Electronic, computer, photographic and printing equipment manufacturing
- Garages (including automotive and other motor vehicles) and maintenance and repair of railcars, marine vehicles and aviation vehicles)*
- Glass manufacturing and production
- Iron and steel manufacturing and production
- Metal fabrication
- Metal treatment, coating, plating and finishing
- Operation of dry-cleaning equipment (where chemicals are used)
- Paints manufacturing and processing
- Pesticides (including herbicides, fungicides and anti-fouling agents) manufacturing and processing
- Pharmaceutical manufacturing and processing
- Plastics (including fibreglass) manufacturing and processing
- Pulp, paper and paperboard manufacturing and processing
- Rail yards, tracks and spurs*
- Rubber manufacturing and processing
- Solvent manufacturing and processing
- Vehicles and associated parts manufacturing
- Tanneries
- Textile manufacturing and processing
- Wood treating and preservative facility

* Indicates high possibility of occurring in Lakeshore IPZ-1, Windsor IPZ-1 and/or Amherstburg IPZ-1



Essex Region Source Protection Committee

Report 08/23

From: Katie Stammer, Source Water Project Manager

Date: Monday, June 19, 2023

Subject: S.36 Update – Combined Sewer Overflow/Sanitary Sewer Overflow Policy Amendments for Prescribed Instruments

Recommendation

THAT the SPC approve the attached amended policies to be submitted to the MECP for early engagement

Summary

- The Table of Drinking Water Threats was updated in 2021
- The threat circumstances for various wastewater circumstances were changed
- Amended and/or new policies are required in the Essex Region Source Protection Plan

Discussion

Further to SPC Report 02/23 and 05/23, ERSPA staff have completed amendments to the existing Prescribed Instrument (PI) policies and a rationale statement for all policies related to the establishment, operation or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage. The new sub-threat introduced in the 2021 Director Technical Rules (DTR) has been included in one of the existing PI policies.

The existing threat circumstances were amended in the 2021 DTR to adjust volume thresholds and to use language consistent with other legislation (sub-threat 2.6 and 2.8). A new threat circumstance was also added to address wet wells, holding tanks or tunnels in sanitary sewage pumping stations or lift stations where human waste is stored (sub-threat 2.7). This new threat is proposed to be addressed by adding it to two existing policies. One policy prohibits the activity using a Prescribed Instrument with the MECP as the implementing body. The second policy prohibits the activity through municipal by-law with Lakeshore, Windsor and Amherstburg as the implementing bodies. These policies are not

expected to have a negative impact since sewage is not stored in these locations, apart from the Windsor retention basin.

Existing policies

- Policy 2 – Uses Environment Compliance Approvals (ECAs) to prohibit sewage outfall and sewage treatment process or holding tanks in Lakeshore, Windsor and Amherstburg IPZ-1, with the exception of storage in Windsor IPZ-1 for the purpose of reducing CSOs
- Policy 3 – Uses ECAs to manage the exception of storage in Windsor IPZ-1 for the purpose of reducing CSOs
- Policy 7 – Uses ECAs to manage sewage outfalls in Windsor IPZ-2

Suggested Amendments and Additions

- New policy combining Policy 2 and Policy 7 – Uses ECAs to prohibit sewage outfall in IPZ-1s and manage outfalls in Windsor IPZ-2
- New policy combining Policy 2, 3 and the new sub-threat (wet well, holding tank or tunnel), all related to holding sewage – Uses ECA to prohibit wet wells, holding tanks or tunnels and sewage treatment process or holding tanks in Lakeshore, Windsor and Amherstburg IPZ-1, with the exception of storage in Windsor IPZ-1 for the purpose of reducing CSOs. Uses ECA to manage the exception of storage in Windsor IPZ-1 for the purpose of reducing CSOs.

Suggested Policy Text

- No new final effluent outfall or sewage treatment plant overflow outfall that is part of a wastewater treatment facility shall be permitted in IPZ's with vulnerability score of 9 or more. *(Previously Policy 2)*

In reviewing Environmental Compliance Approvals (Certificates of Approval) for wastewater treatment facilities with a final effluent outfall or sewage treatment plant overflow outfall within vulnerable areas with a score of 8 or 8.1 (i.e. Windsor IPZ-2), the Ministry of Environment shall ensure that the Environmental Compliance Approvals (Certificates of Approval) adequately manage these activities in order to adequately protect future sources of drinking water. *(Previously policy 7)*

- No wet well, holding tank or tunnel that forms part of a wastewater collection facility as part of a sanitary sewage pumping station or lift station and stores sanitary sewage containing human waste (*new*), nor sewage treatment plant process tank or a sewage treatment plant holding tank that forms part of a wastewater treatment facility shall be permitted in IPZ's with vulnerability score of 9 or more, with the exception of storage, in the Windsor IPZ-1, of future storm water and sewage from combined sewers, for the purpose of reducing combined sewer overflows (CSOs). *(Previously Policy 2)*

In reviewing applications for Environmental Compliance Approvals (Certificates of Approval) under the legislation governing this activity, in the Windsor IPZ-1, the Ministry of Environment shall allow the establishment of systems that store combined storm water and sewage, where such systems are specifically for the purpose of reducing combined sewer overflow. The Environmental Compliance Approval (Certificate of Approval) shall require that, through terms and conditions specified in the Environmental Compliance Approval (Certificate of Approval), the future storage of stormwater and sewage is managed in order to protect sources of drinking water. *(Previously Policy 3)*

Summary

These recommendations are the final policies required for this threat to align with the 2021 Director Technical Rules. The total number of policies addressing this threat is reduced from 11 to 7, which also simplifies the SPP while meeting all of the requirements in the 2021 DTR.

Threat ID	Policy Number	Threat	Policy Tool	Recommendation
2.6	1	CSO/SSO/PSO	Prescribed Instrument - Prohibit	Retain
2.8	2	Effluent/storage	Prescribed Instrument - Prohibit	Retain and combine with Policy 3 and 7
2.7, 2.8 (storage)	3	Storage	Prescribed Instrument - Manage	New policy combined with Policy 2 and 3
2.8	7	Effluent	Prescribed Instrument - Manage	Remove and combine with Policy 2
2.8	34	Eluent	Specify Action – comply with ECA	Revise
2.8	35	Effluent	Specify Action – add specific chemical	Remove
2.6, 2.8	36	CSO	Specify Action	Revise
2.6	37	CSO	Govern Research	Remove
2.3, 2.4, 2.6, 2.8	38	CSO	Education and Outreach	Revise
2.6	39	CSO	Stewardship/ Incentive	Remove
2.7, 2.8 (storage)	40	Storage	Specify Action – prohibit through by-law	Retain

RECOMMENDATION

THAT the SPC approve the attached amended policies to be submitted to the MECP for early engagement



Katie Stammler, PhD
 Project Manager, Source Water Protection

Attachments: Amended policies for review

The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage

2.6 Wastewater Collection Facilities and Associated Parts: Outfall of a Combined Sewer Overflow (CSO), or a Sanitary Sewer Overflow (SSO) from a Manhole or Wet Well.

Chemical and/or Pathogen
Existing and/or Future Activities

Lakeshore IPZ-1, Windsor IPZ-1, Windsor IPZ-2, Amherstburg IPZ-1
IPZs with vulnerability score of 8 or higher

Risk Level: Significant

Approach: Prohibit

Policy Tool: Prescribed Instrument – Environmental Compliance Approval (Certificate of Approval), Section 39, Part V, the Environmental Protection Act

Implementing Body: MECP

Legal Effect: Must conform/comply with

Compliance Date: when the Source Protection Plan or its amendments take effect

Significant Risk Circumstance Chemical:

A combined sewer or partially separated sanitary sewer outfall that discharges combined sewer overflow (CSO), or a manhole that discharges sanitary sewer overflow or a wet well outfall that discharges sanitary pumping station overflow (PSO), and forms part of a wastewater collection facility that may discharge to land or surface water.

The wastewater collection facility is designed to convey 10,000 – 100,000m³/d (IPZ 9) or >100,000 m³/d (IPZ 8) of sewage

Significant Risk Circumstance Pathogen:

A combined sewer or partially separated sanitary sewer outfall that discharges combined sewer overflow (CSO), or a manhole that discharges sanitary sewer overflow or a wet well outfall that discharges sanitary pumping station overflow (PSO), and forms part of a wastewater collection facility

The discharge may result in the presence of one or more pathogens in groundwater or surface water.

Policy Text:

No new combined sewers or partially separated sanitary sewer outfall that discharge combined sewer overflow (CSO), or a manhole that discharges sanitary sewer overflow or a wet well outfall that discharges sanitary pumping station overflow (PSO) shall be permitted where they are considered to be a significant drinking water threat (IPZ's with vulnerability score of 8 or more).

The establishment, operation or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage

2.8 Wastewater Treatment Facilities and Associated Parts

Chemical and/or Pathogen

Existing and/or Future Activities

Lakeshore IPZ-1, Windsor IPZ-1, Windsor IPZ-2 Amherstburg IPZ-1
IPZs with vulnerability score of 8 or higher

Risk Level: Significant

Approach: Prohibit or Manage

Policy Tool: Prescribed Instrument – Environmental Compliance Approval (Certificate of Approval), Section 39, Part V, the Environmental Protection Act

Implementing Body: MECP

Legal Effect: Must conform/comply with

Compliance Date: when the Source Protection Plan or its amendments take effect

Significant Risk Circumstance Chemical:

A final effluent outfall or a sewage treatment plant overflow outfall that is part of a wastewater treatment facility, where the wastewater treatment facility is designed to discharge treated sanitary sewage at an average daily rate that is $>17,500\text{m}^3/\text{d}$ (vulnerability score 9) or $>50,000\text{m}^3/\text{d}$ (vulnerability score 8)

Significant Risk Circumstance Pathogen:

A final effluent outfall or a sewage treatment plant overflow outfall that is part of a wastewater treatment facility, where a discharge may result in the presence of one or more pathogens in groundwater or surface water (vulnerability score 8 or higher)

Policy Text:

No new final effluent outfall or sewage treatment plant overflow outfall that is part of a wastewater treatment facility shall be permitted in IPZ's with vulnerability score of 9 or more.

In reviewing Environmental Compliance Approvals (Certificates of Approval) for wastewater treatment facilities with a final effluent outfall or sewage treatment plant overflow outfall within vulnerable areas with a score of 8 or 8.1 (i.e. Windsor IPZ-2), the Ministry of Environment shall

ensure that the Environmental Compliance Approvals (Certificates of Approval) adequately manage these activities in order to adequately protect future sources of drinking water.

The establishment, operation or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage

2.7 Wastewater Collection Facilities and Associated Parts: Sewage Pumping Station or Lift Station Wet Well, a Holding Tank or a Tunnel

2.8 Wastewater Treatment Facilities and Associated Parts

Pathogen

Existing and/or Future Activities

Lakeshore IPZ-1, Windsor IPZ-1, Amherstburg IPZ-1
IPZs with vulnerability score of 9 or higher

Risk Level: Significant

Approach: Prohibit or Manage

Policy Tool: Prescribed Instrument – Environmental Compliance Approval (Certificate of Approval), Section 39, Part V, the Environmental Protection Act

Implementing Body: MECP

Legal Effect: Must conform/comply with

Compliance Date: when the Source Protection Plan or its amendments take effect

Significant Risk Circumstance Pathogen:

1. A wet well, a holding tank or a tunnel that forms part of a wastewater collection facility as part of a sanitary sewage pumping station or lift station and stores sanitary sewage containing human waste.
2. A sewage treatment plant process tank or a sewage treatment plant holding tank that forms part of a wastewater treatment facility.

A spill may result in the presence of one or more pathogens in groundwater or surface water.

Policy Text:

No wet well, holding tank or tunnel that forms part of a wastewater collection facility as part of a sanitary sewage pumping station or lift station and stores sanitary sewage containing human waste, nor sewage treatment plant process tank or a sewage treatment plant holding tank that forms part of a wastewater treatment facility shall be permitted in IPZ's with vulnerability score of 9 or more, with the exception of storage, in the Windsor IPZ-1, of future storm water and sewage from combined sewers, for the purpose of reducing combined sewer overflows (CSOs).

In reviewing applications for Environmental Compliance Approvals (Certificates of Approval) under the legislation governing this activity, in the Windsor IPZ-1, the Ministry of Environment shall allow the establishment of systems that store combined storm water and sewage, where such systems are specifically for the purpose of reducing combined sewer overflow. The Environmental Compliance Approval (Certificate of Approval) shall require that, through terms and conditions specified in the Environmental Compliance Approval (Certificate of Approval), the future storage of stormwater and sewage is managed in order to protect sources of drinking water.