NORTH BAY-MATTAWA SOURCE PROTECTION AUTHORITY
MINUTES
of the

THIRD meeting of the North Bay-Mattawa Source Protection Authority held at 5:30 p.m. on October 24, 2018 in the North Bay-Mattawa Conservation Authority Natural classroom, 15 Janey Avenue North Bay, Ontario.

MEMBERS PRESENT:

Bonfield, Township of	-	**Jane Lagassie**	**(5:30pm – 5:50pm)**
Callander, Municipality of	-	**Rob Noon**	**(5:30pm – 5:50pm)**
Calvin, Township of	-	**Ian Pennell**	**(5:30pm – 5:50pm)**
Chisholm, Township of	-	**Nunzio Scarfone**	**(5:30pm – 5:50pm)**
East Ferris, Municipality of	-	**Mike Voyer**	**(5:30pm – 5:50pm)**
Mattawa, Town of	-	**Lorne Mick**	**(5:30pm – 5:50pm)**
Mattawan, Municipality of	-	**Carole Curran**	**(5:30pm – 5:50pm)**
Nipissing, Township of	-	**Tom Marchant**	**(5:30pm – 5:50pm)**
North Bay, City of	-	**Chris Mayne**	**(5:30pm – 5:50pm)**
North Bay, City of	-	**Jeff Serran**	**(5:30pm – 5:50pm)**
Papineau –Cameron, Township of	-	**Alvina Neault**	**(5:30pm – 5:50pm)**
Powassan, Municipality of	-	**Dave Britton**	**(5:30pm – 5:50pm)**
Strong, Township of	-	**Vi Montpetit**	**(5:30pm – 5:50pm)**

MEMBER(S) ABSENT:

North Bay, City of,	-	**Dave Mendicino**
South River, Village of	-	**Vacant**

ALSO PRESENT:

Brian Tayler, CAO, Secretary-Treasurer
David Ellingwood, Manager, Source Water Protection
Helen Cunningham, Manager, Finance & Human Resources
Paula Scott, Director, Planning & Development/Deputy CAO
Rebecca Morrow, Administrative Assistant
Sue Buckle, Manager, Communications & Outreach

1. Approval of the Agenda

In the absence of Chair Dave Mendicino, Vice Chair Chris Mayne chaired this meeting. Chris welcomed everyone to the meeting and extended regrets on behalf of Dave Mendicino, after which the following resolution was presented:

Resolution No. SPA14-18, SerraCurran-Lagassie

THAT the agenda is approved as presented.

Carried Unanimously

2. Adoption of Previous Minutes of April 25, 2018

After discussion the following resolution was presented:

Resolution No.SPA15-18, Scarfone-Voyer

THAT the minutes of the meeting held on April 25, 2019 are adopted as written.

Carried Unanimously

3. Declaration of Pecuniary Interest

None declared.

4. Project Managers Report

The members reviewed David Ellingwoods' report. After discussion the following resolution was presented:

Resolution No.SPA 16-18 Mick-Neault

THAT the Project Manager's report dated October 17, 2018 be received and appended to the minutes of this meeting.

Carried Unanimously

5. Section 36 Report

The members reviewed the Section 36 Report. After discussion the following resolution was presented:

Resolution No.SPA 17-18 Britton-Monpetit

THAT the proposed workplan under s. 36 of the Clean Water Act to amend the current assessment Report and Source Protection Plan be adopted with modifications discussed at the October 24, 2018 SPA Meeting, and

FURTHER THAT the North Bay- Mattawa Conservation Authority directs that the s. 36 workplan be submitted to the Ministry of Environment, Conservation and Parks by November 30, 2018, and

FURTHER THAT the Report be appended to the minutes of this meeting.

Carried Unanimously

6. Source Protection Committee Selection Committee

No Report written report was given on this topic. David Ellingwood presented a verbal report, letting members know that the selection process for Source Protection Committee members would need to be discussed at the next meeting. The members thanked David for his update.

7. New Business

Vi Montpetit gave notice to members that this would be her last meeting, as she is moving out of the area. The Chair and members thanked Vi for her service and wished her well.
Brian Tayler reminded members that they are considered as voting members until such time the municipality makes a new or different appointment.

7. Adjournment (5:50 p.m.)

As there was no further new business, the following resolution was presented:

Resolution No. 18-18, Marchant-Pennell

THAT the meeting be adjourned, and the next meeting will be held at the call of the Chair.

Carried Unanimously

Chris Mayne, Chair

Brian Tayler, Chief Administrative Officer, Secretary Treasurer

APPENDIX 1

TO: The Chairman and Members of the
North Bay-Mattawa Source Protection Authority (SPA)

ORIGIN: David Ellingwood, Supervisor Source Water Protection

DATE: October 17, 2018 (for SPA meeting October 24)

SUBJECT: **Project Manager's Report**

RECOMMENDATION: That this report of the Project Manager be received for information and appended to the minutes of this meeting.

The following two topics are included for information:

- Items of Interest from Recent Meetings
- Upcoming Progress Report for Fiscal 2018-19

BACKGROUND:

The SPA role in Source Protection is to oversee the development and implementation of a local Source Protection Plan (SP Plan) developed by the Source Protection Committee (SPC). The North Bay-Mattawa Conservation Authority (NBMCA) administers the program and provides necessary resources according to an agreement with the SPA. Work undertaken by the SPA needs to be in compliance with the Clean Water Act (2006) and its regulations which are administered by the Ministry of Environment Conservation and Parks (MECP).

ANALYSIS:

1. Items of Interest from Recent Meetings

The new Supervisor, Source Water Protection started on July 3, 2018. There was a one-month overlap period with the retiring Project Manager to allow for the transfer of knowledge and orientation. The drafting of the s.36 workplan for updates to the Source Protection Plan has been one of the primary tasks over the last few months (see report later in the agenda).

The Project Manager has attended several in-person meetings and teleconferences recently. A northern chapter Project Managers' meeting was held in Sudbury in July 2018. Among the items discussed was the role of the SPA in providing an official notice to municipalities during a Class EA for work on drinking water wells and intakes. The notice would attest about the completeness of technical work done for the EA which would be necessary to amend the mapping, text and policies in the Source Protection Plan regarding that municipal drinking water system. It is a way to ensure that the Source Protection Plan stays current and the work is done in a timely fashion.

In late August 2018, Nipissing University hosted a field camp for about 15 graduate students from Ontario Universities with a focus on cyanobacteria. The Callander Bay blue-green algae issue was of particular interest. NBMCA staff, including the Project Manager, provided presentations and hosted on-site stewardship visits. The areas of study of the participants varied from biological processes and root causes to aerial reconnaissance and social impacts.

At the beginning of October, the Project Manager participated in a workshop to review a climate change assessment tool being developed in part by Conservation Ontario the Ontario Climate Change Consortium and the Ministry of Environment, Conservation and Parks. The tool will allow data on climate normal and climate change predictions to be input into the assessment tool. The tool will then provide a series of potential impacts to water quality related to the prescribed drinking water threats considered in drinking water source protection. This information may be used to consider possible changes to the Source Protection Plan and, accordingly, has been included as an update item in the s. 36 workplan (see discussion in workplan attached as Appendix 3 to this agenda).

2. Progress Report on Fiscal 2018-19

One of the deliverables under the grant funding agreement with the MECP is a progress report after the second quarter. This report is due October 31, 2018 and covers the period from April 1, 2018 through September 30, 2018. A total of amount of $276,730 has been allocated in the agreement which runs for the government fiscal year from April 1, 2018 to March 31, 2019. Expenses through September 30, 2018 total to $136,981 or 49.5% of the total budget. Projected expenses to the end of the fiscal are expected to be at or slightly less than the budget amount.

RECOMMENDED RESOLUTION:

1. That this report be received and appended to the minutes of this meeting.

David Ellingwood
Supervisor, Source Water Protection

Brian Tayler
CAO, Secretary Treasurer

APPENDIX 2

TO: The Chairman and Members of the
North Bay-Mattawa Source Protection Authority (SPA)

ORIGIN: David Ellingwood, Supervisor Source Water Protection

DATE: October 17, 2018 (for SPA meeting October 24)

SUBJECT: **Development of s.36 Workplan to Update SP Plan (due November 30, 2018)**

RECOMMENDATION: That the proposed workplan required under s. 36 of the Clean Water Act to amend the current Assessment Report and SP Plan be adopted with modifications discussed at the October 24, 2018 SPA meeting; and further

That the North Bay-Mattawa Source Protection Authority directs that the s.36 workplan be submitted to the Ministry of Environment, Conservation and Parks by November 30, 2018.

BACKGROUND:

The Minister issued an s. 36 order at the time of approval of the current Source Protection Plan in 2015. The North Bay-Mattawa Source Protection Authority must submit a workplan under s.36 of the Clean Water Act for the review and updating of the Assessment Report and Source Protection Plan. The deadline to submit the workplan is November 30, 2018.

A meeting for the agricultural community took place in March 2018 and two open houses were held in June 2018 to inform the public about potential update topics and to seek comments. The SPC discussed the preliminary list of updates and other possible revisions at the June 18, 2018 SPC meeting.

The results of these initial discussions informed the draft workplan presented at the September 2018 SPC meeting. Comments from the SPC and preliminary input from the Ministry of Environment, Conservation and Parks have been incorporated into the revised draft included in the SPA agenda as Appendix 3.

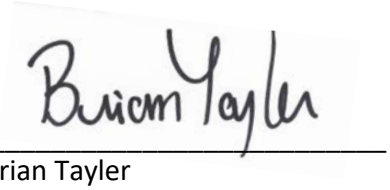
The update items are divided into three broad categories: items listed in the Minister's s.36 order; updates as a result of changes in legislation or guidance documents; and items to incorporate new science and other improvements.

RECOMMENDED RESOLUTION:

That the proposed workplan required under s. 36 of the Clean Water Act to amend the current Assessment Report and Source Protection Plan be adopted with modifications discussed at the October 24, 2018 SPA meeting; and further

That the North Bay-Mattawa Source Protection Authority directs that the s.36 workplan be submitted to the Ministry of Environment, Conservation and Parks by November 30, 2018.

David Ellingwood
Supervisor, Source Water Protection



Brian Tayler
CAO, Secretary Treasurer

North Bay - Mattawa Source Protection Area

Workplan
for Comprehensive Review and Update
of the North Bay – Mattawa
Source Protection Plan

per Clean Water Act (2006) - Section 36

November 30, 2018

Prepared by

North Bay - Mattawa Conservation Authority

15 Janey Avenue, North Bay ON P1C 1N1

Acknowledgments

The North Bay-Mattawa Source Protection Authority acknowledges the efforts and support of local municipalities, Conservation Ontario and the Ministry of Environment, Conservation and Parks (MECP) in the preparation of this workplan. The MECP is also thanked for their continued support through capacity funding under the Ontario Drinking Water Source Protection program.

Executive Summary

The North Bay-Mattawa Source Protection Plan was developed over the course of several years under Ontario's *Clean Water Act* and associated regulations and technical guidance. This legislation was passed in response to Justice O'Connor's inquiry and recommendations stemming out of the water contamination tragedy that occurred in Walkerton, Ontario, in May 2000.

The North Bay-Mattawa Source Protection Plan was approved by the Minister of the Environment and Climate Change on March 5, 2015, with an effective date of July 1, 2015. Source protection plan policy implementation is well underway by the different implementing bodies. The first annual progress report was prepared and submitted to the Ministry of the Environment, Conservation and Parks (MECP) on May 1, 2018.

The North Bay-Mattawa Source Protection Area is comprised of the jurisdiction of the North Bay-Mattawa Conservation Authority (NBMCA) plus the South River watershed, and covers approximately 4,000 km^2. There are a total of five municipal drinking water systems in the North Bay- Mattawa Source Protection Area, of which three are surface water based and two are groundwater based.

Section 36 (s.36) of the *Clean Water Act*, 2006 is intended to ensure that assessment reports and source protection plans (SP Plan) undergo a comprehensive review and update on a periodic basis. An order was issued under s.36 of the *Clean Water Act* to the North Bay - Mattawa Source Protection Authority by the Minister of the Environment and Climate Change on March 5, 2015. The s.36 order specifies that the North Bay- Mattawa Source Protection Authority shall prepare and submit a workplan to the MECP by November 30, 2018. The order requires that the workplan include: detailed steps for the Assessment Report and SP Plan update; portions of the plan to be reviewed; timelines for the steps; rationale; communications and consultation; and information sources. The Minister's s.36 order also requires an analysis of the effectiveness of some of the non-regulatory policies and the results of the research project for the Callander issue contributing area.

The s.36 workplan proposal has been developed in consultation with the North Bay-Mattawa Source Protection Committee, participating municipalities of the North Bay-Mattawa Source Protection Area and the Ministry of the Environment, Conservation and Parks. In addition, a meeting for the agricultural community took place in March 2018 and two public meetings were held in June 2018 to receive feedback on SP Plan implementation and to present a preliminary analysis of potential updates.

Certain tasks in the workplan will incorporate recent, on-going or new scientific information into the Assessment Report. A review of some of the existing SP Plan policies will be completed and new or modified policies may be proposed to ensure the protection of municipal drinking water sources per the *Clean Water Act*, 2006. The proposed reviews and updates contained in this workplan are summarized in **Table A** below. The presence of the chemical PFAS (perfluoroalkylated substances) from a historical use within the Trout Lake intake protection zone drew strong interest from the Source Protection Committee. The lack of provincial drinking water guidelines for this chemical and the technical considerations used to define a 'condition' mean that the matter cannot be included in the source protection plan. However, the Source Protection Committee will keep apprised of the situation and is encouraged by the cooperation to-date between the Department of National Defence and local and provincial agencies to monitor the presence of PFAS and work toward remediation.

The timeline for completion of all proposed reviews and updates in the s.36 workplan is March 2020. The North Bay- Mattawa Source Protection Committee with support from North Bay-Mattawa Source Protection Authority staff will complete the proposed updates. Discussions with the municipalities, applicable implementing bodies and the MECP will be very important throughout the completion of the workplan tasks. Consultation may also take place with persons potentially engaged in significant drinking water threat activities, if the policy changes or other revisions could affect their property.

Table A – Proposed Updates and Revisions to Assessment Report and Source Protection Plan

Update No.	Description of Proposed Review and Update	Applicable Document
Tasks specified in s.36 order		
1	Education and outreach policies: - analyze effectiveness of education and outreach policies in addressing significant drinking water threats	SP Plan for any policies
2	Land use planning policies: - modify wording of policies to ensure effectiveness in managing or prohibiting prescribed threats	SP Plan for any policies
3	Callander Issue Contributing Area (ICA) - analyze cumulative results of Callander ICA phosphorus research; - refine ICA extents using additional and more current watercourse and pathway information; - review potential threat activities; - consider if policy changes or additions are needed	AR for assessment; SP Plan for any policies
Items resulting from changes to Technical Rules or other guidance		
4	Hydrocarbon pipeline as a prescribed threat: - assess if significant threat in vulnerable areas; - determine if policies should be added to SP Plan	AR for assessment of pipeline risk; SP Plan for any policies
5	Above-grade fuel storage: - assess occurrence of above-grade fuel storage in amounts >2500L where it would be a significant threat (i.e. IPZs and WHPAs scoring 9 or higher)	AR for assessment; SP Plan for any policies
6	ASM, NASM and Livestock threat policies: - review wording of policies for agricultural source material (ASM), non-agricultural source material (NASM) and livestock threats; - ensure polices are effective and can be implemented; - confirm that policies do not prohibit these activities except in certain vulnerable areas	SP Plan for any policies
7	Climate change adaptation - review sections of Assessment Report to incorporate current climate model consensus	AR for discussion

Update No.	Description of Proposed Review and Update	Applicable Document
8	Significant groundwater recharge area vulnerability scoring: - update mapping and text to remove scoring (as per March 2017 Technical Rule changes)	AR text and maps
9	Align policy wording with updated 'short names' in the Tables of Contents of the Tables of Drinking Water Threats.	SP Plan for any policies
Extension of knowledge or new science		
10	Trout Lake IPZ extent and scoring: - check IPZ extents based upon refined watercourse layer; - re-evaluate vulnerability scoring; - update mapping as required; - review potential threat activities; - consider if policy changes or additions are needed	AR for scoring and mapping; SP Plan for any policies
11	Transportation threats for all systems - seek Director approval to use events-based area approach; identify and delineate areas near intakes that are vulnerable to spills from transportation of hazardous goods by rail or highway; OR - seek revision to Director approval of local threat related to transportation of hazardous substances; additional lines on threat table to evaluate higher volumes of specific chemicals of concern - consider possible changes or additions to policy suite	AR for assessment and mapping; SP Plan for any policies
12	Policy review where implementation complete: - review wording of policies that have been effectively achieved; - consider revisions to ensure maintenance of initial outcome	SP Plan for any policies

Note: AR refers to the Assessment Report for the North Bay-Mattawa Source Protection Area

SP Plan refers to the Source Protection Plan for the North Bay-Mattawa Source Protection Area

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1. Introduction

Ontario's *Clean Water Act*, 2006 helps communities to protect sources of municipal drinking water systems from contamination and overuse. The Act was created in response to the "Report of the Walkerton Inquiry - by Justice Dennis R. O'Connor", which was released in 2002. The inquiry examined the circumstances around the E. coli bacteria contamination of the municipal drinking water system in Walkerton, Ontario in May of 2000. This contamination was the cause of seven deaths and thousands of residents becoming ill. Justice O'Connor emphasized that protecting drinking water at the source is the first step in a multi-barrier approach and an important part of ensuring the health of people, ecosystems and economies. "We should never be complacent about drinking water safety" - Justice Dennis R. O'Connor.

The *Clean Water Act* provides a framework for the development and implementation of local, watershed-based source protection plans (SP Plan). The Act sets out a risk-based process to identify vulnerable areas and associated drinking water threats and issues. It requires the development of policies and programs to reduce or eliminate the risk posed by significant threats to sources of municipal drinking water.

Assessment reports (ARs) and SP Plans must be comprehensively reviewed and updated per section 36 (s.36) of the *Clean Water Act* to ensure sustained protection of municipal drinking water sources and for the SP Plans to stay current. At the time of SP Plan approval, most Source Protection Authorities (SPA), including the North Bay-Mattawa SPA, also received a s.36 order that outlined the timeframe and certain topics to be addressed during the review (see Appendix A). The workplan enclosed herein provides the context for the review, outlines the process, describes the matters to be reviewed, identifies information sources, and lists consultation opportunities.

1.1 North Bay-Mattawa Source Protection Area

The North Bay-Mattawa Source Protection Area is located in northeastern Ontario approximately 350 km north of Toronto and a similar distance west of Ottawa. It covers approximately 4,000 km^2 extending from the Town of Mattawa in the east to the City of North Bay in the west and south to the Village of South River (see Figure 1). A major divide cuts through the area from north to south directing water flow either towards the Mattawa River and the Ottawa River, or to Lake Nipissing and the Great Lakes. The total population residing within the SP Area is estimated at 74,500 (Statistics Canada, 2007).

Five communities in the SP Area are serviced by municipal drinking water systems classified as large municipal residential systems under O.Reg 170/03. The source for two of these systems is groundwater and the remaining three draw from surface water. Details for all five systems are summarized in Table 1.

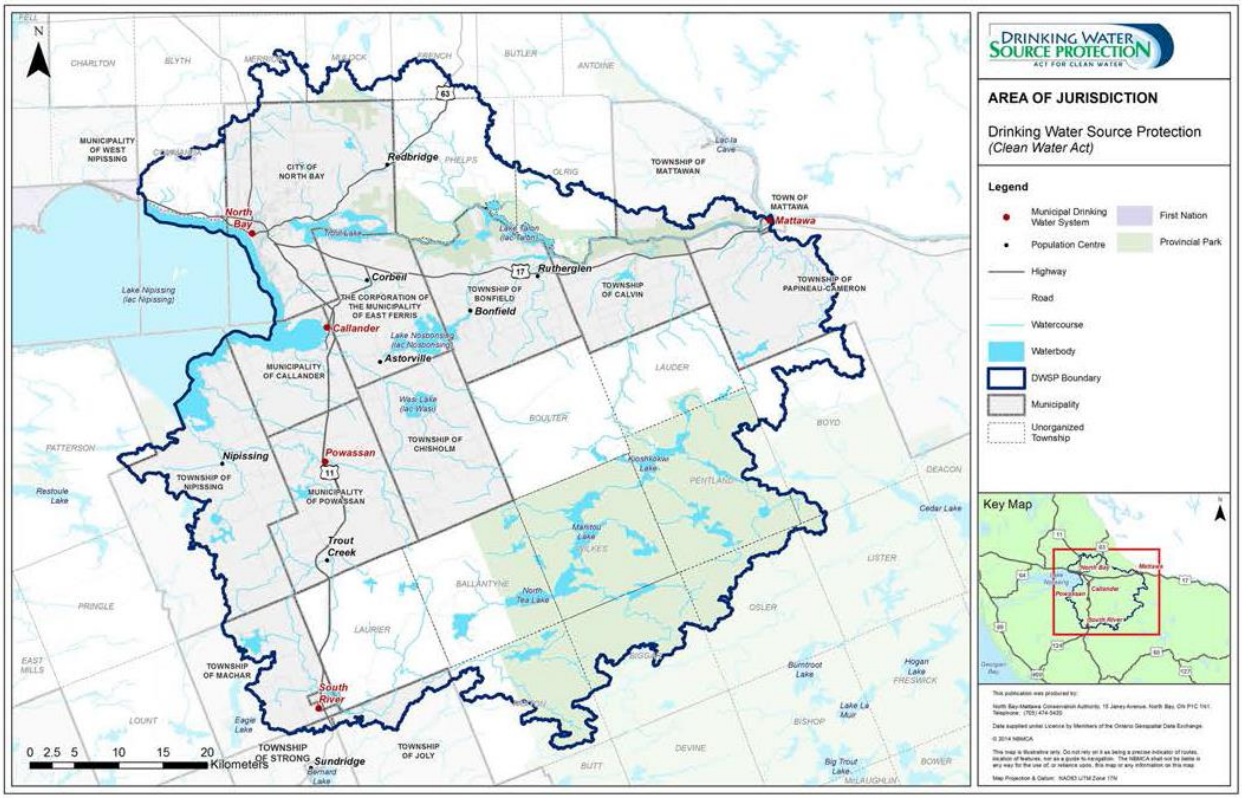


Figure 1 - Map of North Bay-Mattawa Source Protection Area. Communities with a municipal drinking water system are highlighted in red.

Table 1. Municipal Drinking Water Systems in the North Bay-Mattawa SP Area

Municipality	Drinking Water System Name	Drinking Water Source	Drinking Water System Location	Population Serviced
Municipality of Callander	Callander Water Treatment Plant	Surface Water (Callander Bay)	100 Nipissing St., Callander	1,700
City of North Bay	North Bay Water Treatment Plant	Surface Water (Trout Lake)	248 Lakeside Dr., North Bay	53,000
Village of South River	South River Water Treatment Plant	Surface Water (South River Reservoir)	28 Howard St., South River	1,000
Town of Mattawa	Mattawa Well Supply	Groundwater (two wells)	400 Bissett St., Mattawa	2,251
Municipality of Powassan	Powassan Well Supply	Groundwater (two wells)	Fairview Lane, Powassan	1,000

1.2 North Bay-Mattawa Source Protection Plan

The North Bay –Mattawa Source Protection Plan was approved by the Minister of the Environment and Climate Change on March 5, 2015, with an effective date of July 1, 2015. The central component of the SP Plan is the set of policies that address activities that are considered potential drinking water threats. Background information in the SP Plan gives an overview of the threat activities, describes the tools available to address these activities and shows maps of the vulnerable areas for municipal drinking water systems to which the policies would apply.

The SP Plan includes three companion documents: the Terms of Reference; the Assessment Report; and the Explanatory Document. The Terms of Reference outlines the scope of the project, identifying which drinking water systems will be included in the SP Plan. The Assessment Report summarizes the scientific understanding of the area with respect to the movement of water and the risks for contamination and/or depletion. The Explanatory Document provides the rationale for the policies and should be used to assist in the interpretation of the SP Plan.

1.3 Source Protection Plan Implementation Highlights

The first annual progress report was prepared and submitted to MECP on May 1, 2018. The report covered the period from the effective date of the SP Plan on July 1, 2015 through to December 31, 2017.

Policy implementation is well underway; overall, 29 out of 30 policies have been implemented. Certain time-specific tasks were successfully concluded within the timeframes stipulated in SP Plan policies. All municipalities have fully implemented the land use planning policies through their day-to-day processes and in their Official Plan and Zoning By-laws. Education and outreach programs have been initiated. These activities require on-going efforts to ensure continued effectiveness.

Mandatory maintenance inspections of septic systems were conducted on two systems which were located in areas where a malfunctioning system might pose a threat due to the release of pathogens. Within the Callander issue contributing area, the listing of phosphorus as a potential factor in the growth of blue green algae meant that 567 septic systems had to be inspected. Three systems required replacement due to major deficiencies, which represents a failure rate of only 0.5%.

2. Workplan Development

The North Bay-Mattawa SPA has followed the guidance provided in MECP bulletins in the development of the s.36 workplan. The first bulletin was issued in December 2016 and was entitled "Overview of Requirements for Assessment Report and Source Protection Plan Amendments under S. 36 of the Clean Water Act". The bulletin indicates that the s.36 updates are intended to "build in new information that advances the understanding of risks to sources of drinking water and incorporates local growth". Three supplemental information bulletins were also used to develop this s.36 workplan:

- Municipal Engagement (October 2017)
- Prohibition of Agricultural Policies Outside of WHPA-A or IPZ-1 (March 2018)
- Updates to Director Technical Rules and Tables of Drinking Water Threats (tbd 2018).

An s.36 order was issued to the North Bay-Mattawa SPA from the Minister of Environment, Conservation and Parks (MECP, formerly known as the Ministry of Environment and Climate Change) at the time of the SP Plan approval. The Minister's s.36 order specified that the SPA prepare and submit a workplan to the MECP by November 30, 2018. The order required that the following items be considered in the workplan:

- Results of monitoring policies, research initiatives and programs with regard to phosphorus condition for the Callander drinking water system
- Effectiveness of education and outreach policies and land use planning policies at addressing significant drinking water threats

In addition to the above, the s.36 order required that the workplan include detailed steps for the review and update of the Source Protection Plan and be developed in consultation with the North Bay-Mattawa Source Protection Committee (SPC), participating municipalities of the source protection authority, and the MECP. The order also required that the information gained from implementing the SP Plan and from the first annual progress report (2017) be taken into consideration in preparation of the workplan.

2.1 Workplan Consultation

Consultation on the workplan was conducted in a variety of forms including meetings, open houses, in-person meetings, emails, and phone calls. Parties involved in consultation activities included staff from the municipalities, MECP, SPA members, the SPC, and members of the public. The purpose of the consultation was to discuss the proposed workplan and receive comments and feedback. Table 2 presents the timeline for consultation activities.

Table 2. Consultation Activities and Key Dates in Workplan Preparation

Date	Consultation Details (Include: stakeholders present, general purpose, consultation method: workshop, webinar, teleconference call, etc.)
February 15, 2018	SPC Meeting: A report was submitted to the SPC outlining the s. 36 workplan process.
March 8, 2018	Community Consultation held with the Callander-Wasi agricultural community. The purpose was to: • Present results and initial findings of research into the blue-green algae issue • Obtain perspectives on current policy approaches and suggestions for any changes
March 21, 2018	SPC Meeting: Members were advised of: the agricultural community consultation recommendations; draft annual report findings; research summary of Callander phosphorus issue; and upcoming open houses for the s.36 workplan process.
April 8, 2018	Municipal Conference: Local municipal staff and elected officials were advised of upcoming s.36 workplan during project manager's presentation.
May-July 2018	An inventory update was undertaken to determine changes in municipal drinking water systems, wells and intakes, in consultation with municipalities.
May-Sept. 2018	Consultation with MECP on workplan content (phone calls, emails)
June 6, 2018	Public open house in Callander. The purpose was to: • Present preliminary list of update items, particularly phosphorus research and ICA delineation • Obtain feedback and comments regarding the proposed updates.

Table 2. Consultation Activities and Key Dates in Workplan Preparation	
Date	**Consultation Details** **(Include: stakeholders present, general purpose, consultation method: workshop, webinar, teleconference call, etc.)**
June 7, 2018	A meeting was held with the retiring SWP Project Manager, incoming SWP Supervisor, SPC Chair, and SPA managers to discuss the workplan process.
June 14, 2018	Public open house in North Bay. The purpose was to: • Present preliminary list of update items, particularly revised vulnerability scoring of IPZ, transportation threats and PFAS • Obtain feedback and comments regarding the proposed updates.
June 18, 2018	The SPC reviewed a listing of identified SP Plan (including ARs) issues, challenges and limitations. A roundtable discussion was held to gather input on draft list of items and other potential items for inclusion. Workshop materials from the public open houses were reviewed at the meeting.
Sept. 26, 2018	SPC Meeting: Draft workplan for s. 36 updates was reviewed and discussed by SPC.
Oct. 24, 2018	SPA Meeting: Draft workplan for s.36 updates was presented to SPA for approval.
Nov. 30, 2018	The proposed s.36 workplan was submitted electronically to MECP.

2.2 Preliminary Analysis

A preliminary analysis of the AR and SP Plan was conducted considering the nine factors specified in the December 2016 MECP bulletin:

- Results of environmental monitoring programs
- Growth and infrastructure changes
- Council resolutions
- Policy effectiveness
- Implementation challenges
- Technical rule changes
- Impacts of prohibition policies on the agricultural community
- Specific directions in some source protection plan approval letters
- Other local considerations.

The evaluation of each of these factors is considered below. A concluding statement is provided with each analysis to indicate suggested actions, if any, which should be included in the s.36 workplan.

2.2.A: Results of Environmental Monitoring Programs

The presence of perfluoroalkyl substances (PFAS) has been reported in the Trout Lake source water for the North Bay municipal drinking water system. The apparent pathway for the contaminant is seeps of groundwater along the escarpment north of the lake and other discharges, such as from the Department of National Defences' former Underground Complex, that are flowing into Lees Creek, which is a main tributary for Delaney Bay on Trout Lake. A potential source of the PFAS is aqueous film forming foam that was used up until the 1990's for fire suppression and firefighting training at several locations at CFB North Bay and the North Bay Airport as well as the Underground Complex.

An advisory has been posted by the North Bay Parry Sound District Health Unit to not drink the water from Lees Creek, as the levels of PFAS are above Health Canada's Drinking Water Screening Values. The Guide to Eating Ontario Sport Fish advises not to eat fish caught from Lee's Creek (e.g. brook trout) due to contamination from PFAS. The Department of National Defence has prepared a report and continues to monitor several locations. The SPC, City of North Bay and members of the public have expressed an interest in having PFAS declared a condition for the Trout Lake IPZ.

Correspondence from the MECP has noted that there are currently no guidelines in Ontario for safe levels of PFAS in drinking water. As such, the Technical Rules under the Clean Water Act

would not allow for PFAS to be included in an update to the North Bay-Mattawa SP Plan at this time. Further analysis of safe thresholds and guidelines for PFAS in drinking water would be required and the levels would need to be adopted by provincial regulation. At that point a determination could be made about whether the levels found in Trout Lake were a concern relative to the guideline value. The MECP noted in their correspondence that monitoring is on-going and that the MECP district office is actively working on the matter with the Department of National Defence and other agencies.

Monitoring of phosphorus related to the Callander ICA has occurred over many years. A summary report has been prepared by the SPA which compiles the results of the local monitoring programs and presents the findings to-date. This topic is discussed below under factor H: Specific Directions.

Conclusion: No changes to the AR or SP Plan are required under this factor at this time. The SPA and the SPC should continue to monitor information about the PFAS situation in the Trout Lake IPZ.

2.2.B: Growth and Infrastructure Changes

SPA staff contacted each municipality within the North Bay-Mattawa SP Area to inquire about potential changes to municipal drinking water systems. It was determined that none of the municipalities which do not have a municipally run drinking water system intend to establish one in the foreseeable future. Municipalities currently operating the large residential municipal systems noted in Table 1 above do not anticipate an increase in capacity nor replacement of a source component.

The new O. Reg. 205/18 (under the Safe Drinking Water Act, 2002) came into effect on July 1, 2018. Through this new regulation, owners can only apply for a drinking water works permit (and a municipal drinking water license for new systems) once they have confirmation from the SPA that the required technical work has been completed. The SPA will be establishing a local protocol to assess submissions. The protocol will be provided to municipalities so that these criteria can be taken into account by municipalities and their consultants in the early stages of planning for new or changing municipal residential drinking water systems.

Conclusion: No changes to the AR or SP Plan are required under this factor.

2.2.C: Council Resolutions

As noted above, no new municipal drinking water systems are planned within the North Bay-Mattawa SPA. No council resolutions have been received to date.

Conclusion: No changes to the AR or SP Plan are required under this factor.

2.2.D: Policy Effectiveness

The 2017 Annual Progress Report for the North Bay-Mattawa SP Area notes that implementation is well underway or complete for nearly all policies the SP Plan. Threats are being effectively managed through the existing policy set.

Transportation was approved as a local threat by the Director and has been included in the AR and SP Plan. Volumes in excess of 2500L of product are identified as moderate threats in parts of the intake protection zones. However, tanker trucks along the highway corridors and railcars on the Ontario Northland Railway carry ten times or more than this volume. Accidents and spills have occurred within the Trout Lake IPZ-3.

The SPC is concerned that the threat circumstances for the transportation of hazardous goods and the related policies are not addressing potentially significant threats. Additional work should be undertaken to assess the threat level for the larger volumes of material routinely being handled in these vulnerable areas. Should the outcome be that activities under certain circumstances would be significant drinking water threats, then the AR and SP Plan would need to be updated.

Conclusion: Changes to the threats tables for the local threat of transportation of hazardous substances will be pursued. Depending on the outcome of the review, updates to the AR and possible changes to current policies or new policies in the SP Plan will be needed.

2.2.E: Implementation Challenges

Land use planning policies related to agricultural activities have been noted as an implementation challenge for municipalities. Existing activities are difficult to manage with this approach and it is hard to target a specific activity without affecting a land use as a whole. Some refinements to the SP Plan policy or alternative approaches should be considered by the SPC working in concert with municipalities.

Conclusion: Modifications to SP Plan policies related to agricultural activities may be required.

2.2.F: Technical Rule Changes

Amendments to the Director's Technical Rules and Tables of Drinking Water Threats necessitate revisions to the AR and SP Plan. The new prescribed drinking water threat 'the establishment and operation of liquid hydrocarbon pipelines' is relevant to the North Bay-Mattawa SP Area given the recent proposal for such a pipeline through one of the intake protection zones. Threat evaluations completed previously for the Assessment Report show that there may be occurrences of above grade fuel storage in IPZs scoring 9 or higher which may now be considered to pose a significant risk. These activities will need to be reviewed. Significant groundwater recharge areas are no longer scored as per the Technical Rules. The Assessment

Report text and maps will need to be updated. The short names in the Tables of Contents of the Tables of Drinking Water Threats have been modified and these should be changed in SP Plan policies.

Climate change considerations were included in the SP Plan and Assessment Report. Modelling and predictions of future climate norms have been modified since the original Assessment Report was compiled. A review to see if the forecast has altered for the SP Area is warranted The AR would be revised to take current climate change predictions into account. Guidance is to be provided by the MECP and Conservation Ontario to assist in the review of climate data.

Conclusion: Modifications to the AR will be needed to add liquid hydrocarbon pipelines and modify fuel threats. Mapping changes to the AR are need for significant groundwater recharge area. SP Plan policies related to agricultural activities may be required. The AR may need to be modified with current climate change information. Policy wording will need to be refined to utilize current short names from the Table of Drinking Water Threats.

2.2.G: Impacts of Prohibition Policies on the Agricultural Community

The MECP has directed that an analysis of the impact of prohibition policies upon the agricultural community be undertaken during the s.36 workplan preparation. The MECP provided additional guidance in March 2018 entitled "Supplemental Information Bulletin #2 – Prohibition of Agricultural Policies Outside of WHPA-A or IPZ-1".

The North Bay-Mattawa SP Plan contains policies that effectively prohibit, through land use planning, certain agricultural activities which could be significant drinking water threats. The area to which these policies apply extends beyond WHPA-A and IPZ-1 to include WHPA-B and IPZ-2 in three instances. A review of the subject vulnerable areas shows that the areal extent of affected properties is rather limited.

- Callander Bay IPZ-2 (vulnerability score of 8.1):
    - Shoreline residential, and commercial land uses; no agricultural activities present or likely in the future given the small lot sizes
- Mattawa WHPA-B (vulnerability score of 10):
    - entirely within the urban residential area; no agricultural activities present or likely in the future given the small lot sizes
- Powassan WHPA-B (vulnerability score of 10 only near north edge):
    - encompasses the Highway 11 corridor and one rural residential property; small portion of rural residential property (0.05 ha) in WHPA-B is used for hay; half of the remainder of the parcel lies in WHPA-A where the same policies already apply

Of the approximately 250 km^2 of agricultural land in the SPA, Given the very limited scope of the properties affected by the prohibition policies within the SP Plan, it is expected that there

are no undue impacts placed on the agricultural community by the continued inclusion of said policies within the North Bay-Mattawa SP Plan. However, concern has been expressed by the implementing body about the ability to effectively enforce prohibition of certain agricultural activities through land use planning tools. Accordingly, it is recommended that polices SMF1 and SMF2 be reviewed as part of the s.36 workplan.

Conclusion: Changes to related land use policies in the SP Plan may be required. No changes to the AR are need under this factor.

2.1.H: Specific directions in source protection plan approval letter

The s. 36 Order issued to the North Bay-Mattawa SPA required that the following be considered in the workplan:

- Effectiveness of education and outreach policies and land use planning policies as alternatives to Part IV tools at managing significant threats
- Results of research and monitoring in the Callander ICA

Effectiveness of Policies

Education and Outreach

A wide variety of communication tools and initiatives have been utilized to deliver community-based social marketing focusing on significant drinking water threats. Landowners have been informed of activities of concern and been provided tangible ways of managing and lessening impacts on source water. Efforts must be on-going to maintain connections between landowners and agencies, as well as reach new owners and reaffirm messages with past contacts.

To facilitate the review of the effectiveness of this approach, the relevant polices are discussed below.

FUL4 – Education: Handling and Storage of Fuel

Policy FUL 4 applies to 12 households in the Mattawa WHPA and one household in the Powassan WHPA. The policy directs that information be provided on the risks to source water; the proper maintenance and use of systems for the safe storage and use of fuel oil; and how to recognize and respond to a spill.

The actions taken to date to achieve the desired policy outcome include:

- Letter was created and hand delivered to affected properties stating property is vulnerable. A fact sheet was attached and offered a link to the website.
- Local oil delivery companies contacted.
- MOECC info sheet posted on actforcleanwater.ca under “Learn more”
- http://www.actforcleanwater.ca/are-you-affected/protect-from-threats/

- Link provided to Canadian Oil Heat Association website and YouTube channel
- Links to Fact Sheets provided to municipalities for posting on their websites

Information has been provided to both the suppliers and persons who may be engaged in this activity. Given the relatively small number of potential threats involved, the targeted approach taken here should be effective at reaching those individuals and managing the activity.

HAZ1 Education – DNAPLS and Organic Solvents

The North Bay-Mattawa Drinking Water Assessment Report identified specific DNAPLS and Organic Solvents that could pose a threat to municipal drinking water *if spilled in significant quantities*. Policy HAZ1 requires implementing bodies to provide information on the risks to source water and how to reduce them through the safe storage, use and disposal of DNAPLs and Organic Solvents. The policy applies to the Mattawa and Powassan WHPAs.

The actions taken to date to achieve the desired policy outcome include:

- Fact sheet created
- Posted on actforcleanwater.ca
- http://www.actforcleanwater.ca/are-you-affected/protect-from-threats/
- MOECC info sheet posted on actforcleanwater.ca under "Learn more"

In addition, the municipalities actively promote household hazardous waste disposal opportunities locally and at the North Bay municipal drop-off depot. The policy provides information on reducing use of these chemicals and proper disposal of unused amounts. Collectively, these measures effectively manage the activity.

LAU1 Education About Threat Activities in Laurier Township

Laurier Township is an unorganized township near the south end of the Source Protection Area. Policy LAU1 assigns implementation responsibility for education efforts to the adjoining Municipality of South River, which operates the South River drinking water system. Education efforts by South River are extended to the small number affected Laurier Twp properties.

The same rationale for the effectiveness of policies elsewhere in the Source Protection Area applies in this case as well.

WDS3 Education – Hazardous Waste

Policy WDS3 applies to the Mattawa WHPA, Powassan WHPA, South River IPZ, Callander IPZ, and North Bay IPZ. No occurrences of PCB storage were identified in the Assessment Report. The requires implementing bodies to raise awareness and reduce the threat posed to source water from hazardous or liquid industrial waste and polychlorinated biphenyl's (PCBs).

Tips for protecting from the threat of contamination from hazardous waste are posted on http://www.actforcleanwater.ca/are-you-affected/protect-from-threats/

Mattawa, Powassan, North Bay, Callander and South River have public education regarding hazardous waste depots on their websites. South River directs its residents to the hazardous waste depot at the Strong Twp Landfill site twice annually. Dates are posted. All others direct their residents to the City of North Bay's hazardous Material Depot open Wednesdays to Saturday.

Collectively, these measures effectively manage the activity.

PST4 Education about Application of Pesticides

Policy PST4 applies within portions of the municipalities of Mattawa, Powassan, Callander, South River, and Machar. The implementing bodies are required to provide information about the safe application of pesticides. Information on pesticides and their safe use has been made available on the actforcleanwater.ca website (http://www.actforcleanwater.ca/are-you-affected/ protect-from-threats/ and linked from municipal websites

The range of pesticide products available to consumers has been limited by recent provincial initiatives and commercial applicators are already regulated. The education program can effectively manage the activity

ICA1 Education - Microcystin LR in the Callander Issue Contributing Area

Municipalities with sections of the Callander Issue Contributing Area include Callander, Chisholm, East Ferris, Powassan and North Bay. In collaboration with other municipalities, the NBMCA developed a program using the Community Based Social Marketing Approach (www.cbsm.com) to encourage BMPs (best management practices) for phosphorous reduction. CBSM is designed to foster sustainable behaviour through a process which draws heavily on research in social psychology, which indicates that initiatives to promote behavior change are often most effective when they are carried out at the community level and involve direct contact with people.

A 25-member multi-stakeholder group identified the BMPs. A literature search found that shoreline vegetation had been undertaken in multiple municipalities and regions as a BMP to increase phosphorus uptake and reduce transmission of phosphorus into watercourses. There are co-benefits for this effort in the Issue Contributing area including: raising awareness of the impact of the conditions within the watershed; and encouraging behaviours which will help achieve goal.

With funding from the Source Protection Municipal Implementation Fund, the Restore Your Shore Program was created in 2015 (www.restoreyourshore.ca). In that year, 1.8 km of shoreline were planted with close to 3,000 trees, shrubs and perennials on 37 properties within the Callander-Wasi Watershed. The program continued in 2016-2018 as part of NBMCA's stewardship program with grants which required the program be offered throughout NBMCA's 2900 sq km jurisdiction. In the past 3 years, an additional 13 shoreline properties were planted in the Callander ICA.

Educational information which includes planting plans, a plant guide, and blue green algae is provided one-on-one by the stewardship staff with the property owners, through the website, on municipal websites, and at multiple community events and gatherings including Home Shows, Garden Shows, Farmers Markets, Cottager Association Events and other community events. Extensive conversations have taken place with the local Ontario Federation of Agriculture and various public consultations over the past 4 years through the Restore Your Shore Program.

Participation in the program is voluntary. Municipalities assist in promotion of the program through their websites and their planning departments when a development application is accepted. NBMCA promotes shoreline planting through the Section 28 program but cannot mandate shoreline restoration as part of the Section 28 permitting.

The effectiveness of this strategy is long-term. Education and Outreach initiatives in this watershed need to be informed by the findings of the research and monitoring policy. E&O under this policy is the responsibility of the five municipalities in this watershed and requires resources from the municipalities to implement, which has been challenging since the initial SPMIF funding ended. NBMCA is limited in the resources it can provide through the stewardship program. Research has thus far shown that there is significant internal loading in the bay, and that large-scale erosion exists in the watershed which requires more significant action that shoreline planting will remedy.

Additional education and outreach activities have taken place engaging the municipal planners, public works and road staff. Some research into erosion and sediment in the watershed indicated there was need for more BMP by municipal staff as it relates to culverts, drains and ditches. Two municipal conferences have been held for these staff to share insights on these BMPs with respect to sediment and erosion control in municipal works.

The combination of education and the on-the-ground planting activities has helped people to see tangible results that serve to reinforce the various messages. Funding and long-term commitment to maintain efforts have proven to be challenges to sustaining these initiatives. Additional discussion between the municipalities and the NBMCA is needed to determine how best to implement the intent of policy ICA1 going forward.

SMF1 Application of Uncomposted Manure

Policy SMF1 (Municipal Action to Prohibit Land Application of Nutrients) requires municipalities, using tools available to them, to prohibit the application of Agricultural Source Materials (ASM) in areas where the threat to drinking water sources could be significant. The threat would only be significant where the application of ASM could result in the presence of one or more pathogens in groundwater or surface water.

The limited scope of the threat makes it challenging to draft an appropriate by-law. Therefore, municipalities have elected to utilize an education and outreach approach to advise property owners in affected areas of the need to avoid application of certain materials to their land. The threat would principally be from applying manure that has not been composted and is fresh enough to retain active pathogenic organisms. Proper composting addresses the threat of pathogens.

Land Use Policies

The land use policies have resulted in changes to the official plans to address specific threat activities. The prohibition type of policies effectively stop the establishment of significant drinking water threats since land uses associated with the activity are not permitted. It is less clear whether existing activities can be controlled by land use planning. A review of the land use policies should be conducted with input from planning departments.

The combination of these non-regulatory tools has been able to manage both existing and future activities for the most part. Some modifications to the policies may be needed to ensure all activities are addressed in a comprehensive manner. The use of Part IV tools does not appear to offer any appreciable gain in management of threats and would add cost and administrative burden to municipalities who would be responsible for implementing the risk management duties.

Results of Research and Monitoring in the Callander ICA

A summary report on environmental monitoring within the Callander Bay ICA has been prepared by the North Bay-Mattawa Source Protection Authority and is included in Appendix 1. Close to a decade of data gathered by the North Bay- Mattawa Conservation Authority and its collaborators in the Department of Geography at Nipissing University was reviewed. A synopsis of the summary report is provided below to highlight what has been done by way of monitoring and what has been learned in terms of the nature and magnitude of relevant parameters, the management implications and directions for further research.

Introduction

Callander Bay is a relatively large and moderately deep embayment at the east end of Lake Nipissing. Located 10 km south of the City of North Bay, Callander Bay has surface area of 12 km2 and a mean depth of 6.8 metres. The bay exhibits only limited water exchange with Lake Nipissing and has a relatively long water residence time (~0.6 yr). The bay's major tributary is the Wastiwasing (Wasi) River, as well as a handful of small creeks. The upper third of the basin is predominantly forest, the middle third largely agricultural land with some wetlands (around the Wasi River), and the lower third is predominantly natural land (forest & wetland) with some agriculture and infrastructure (HESL 2011). The combined population of the Municipality of Callander (3,864) and Township of Chisholm (1,291), as of 2016, was 5,155 people (Statistics Canada).

Callander Bay is the municipal water source (and wastewater receiving body) for Callander, Ontario. There is public concern because the bay frequently experiences cyanobacteria ("blue-green algae") blooms in the later summer. Common bloom-forming cyanobacteria genera can produce toxins ("cyanotoxins") that can affect the health of humans and other mammals (WHO 1999), such as problems with the skin, liver, nerves, and gastro-intestinal tract (WHO 1999). In addition, the accumulation of surface scums and risk of exposure to toxins degrades the recreational enjoyment of an affected waterbody and may degrade the ecological health of the afflicted ecosystem.

Source Protection Concerns

As part of the preparatory work for the North Bay-Mattawa Assessment Report, a technical study was completed for the Callander municipal drinking water system. One component of the technical work included a review of drinking water quality parameters and any concerns that the system operator had. The periodic occurrence of cyanobacteria blooms and the release of toxins into the source water (Callander Bay) was identified and phosphorus was subsequently flagged as a substance that could contribute to the blooms. Under the Director's Technical Rules, an Issue Contributing Area was mapped which included the tributaries and a setback from the watercourses within all of the Callander Bay watershed. The North Bay-Mattawa

Source Protection Plan (SP Plan) includes a set of policies to manage phosphorus in the Issue Contributing Area.

Study Methods

Water quality samples were collected from streams and lakes within the Callander Bay ICA (Fig. 1), largely between 2009 and 2016. Stream sampling was conducted on the Wasi River, Chiswick Creek, Graham Creek, Windsor Creek, Burford Creek, Cranbery Creek and several small, unnamed watercourses. Lake sampling was conducted at multiple locations on Callander Bay and Wasi Lake typically on a biweekly basis between May and September. Sedimentation rates were alo calculated. Turbidity in the Wasi River was measured in partnership with Dr. April James (Nipissing University) using a turbidity logger. Total phosphorus concentrations were predicted based on turbidity values.

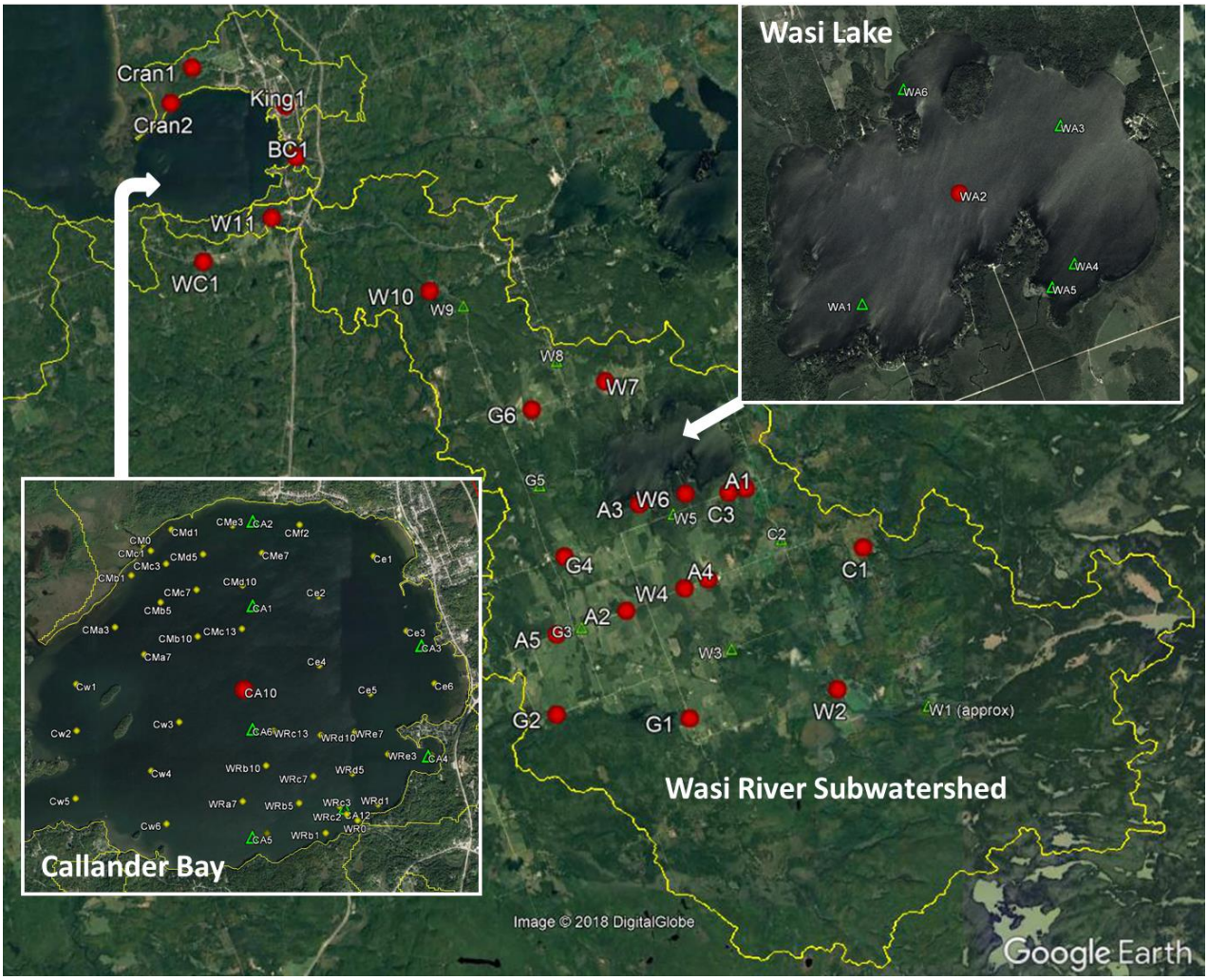


Figure 1. The Callander Bay drainage area and monitoring sites. Main sites are symbolized by red dots.

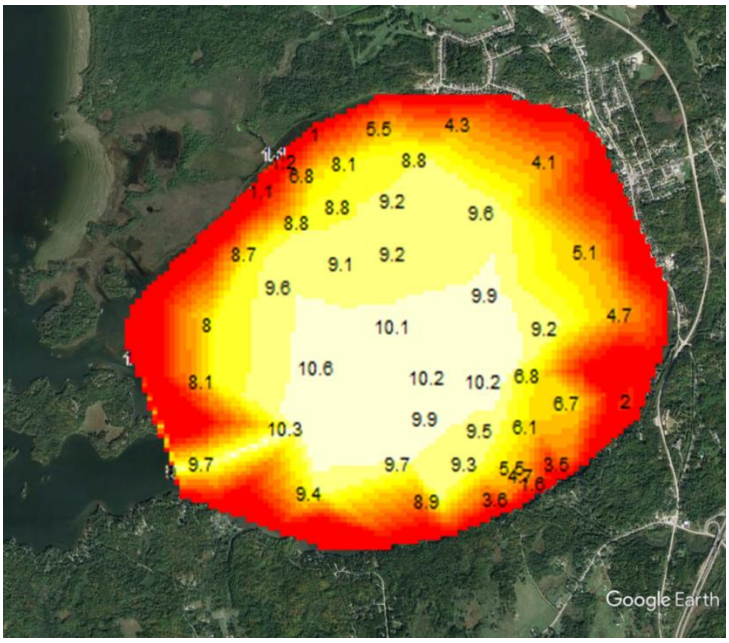


Figure 2. Bathymetry (m) of Callander Bay, Lake Nipissing (measurements made in late summer, 2017).

Observations and Evaluation

Wasi River Subwatershed

- The Wasi River has a TP (total phosphorus) concentration higher than the PWQO (30 µg/L) at all sites except W2.
- Streams running through agricultural areas tend to become enriched with P (e.g., compare G2 vs. G4, W2 vs. W4, and agricultural drains vs. all other sites).
- Wasi Lake acts as a (minor) P 'sink'. Mean TP was ~10% lower downstream of Wasi Lake.
- Graham Creek is an enriching influence on the Wasi River: the mean TP of the Wasi R. upstream of Graham Ck (W7) was 34 µg/L vs. 42 µg/L downstream of Graham Creek (W10).
- Much of the TP is in dissolved form, suggesting that natural sources of P, such as dissolved organic matter exported from wetlands, could be quantitatively important.
- Erosion contributes particulate phosphorus to Wasi River and Graham Creek, as suggested by the general increase in %PP with distance downstream and the correlation between TP and turbidity observed at W10.

- Very high TP concentrations (>70 µg/L) were occasionally observed at W10 but not at W11, likely because larger particulate matter settles out of the Wasi River in the meandering reach south of Lake Nosbonsing Rd; comparison of continuous turbidity data collected at W10 and downstream of W11 following a major rain event support this conclusion.

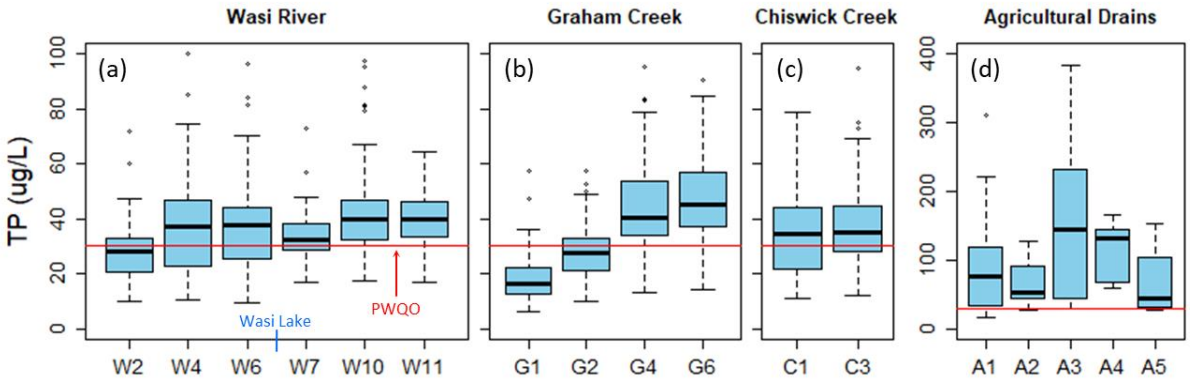


Figure 3. Total phosphorus (TP) concentrations in (a) the Wasi River, (b) Graham Creek, and (c) Chiswick Creek, all for 2009-16, and (d) in agricultural drains (all available data). Note the larger range of the y-axis in panel (d). The following outliers were excluded: G1 (114, 116, 226 µg/L), G4 (105, 119 µg/L), G6 (109 µg/L), C1 (112 µg/L), and A1 (642 µg/L).

Callander Bay/South Shore Subwatershed

- Burford Creek and the small, unnamed creek in Callander have relatively low TP concentrations, usually close to or below the PWQO of 30 µg/L.

- Based on a comparison of the same period (2012-16), the mean **TP concentration of Windsor Creek (49 µg/L) is much higher than that of the Wasi River** at W11 (37 µg/L).

- Based on 2016 data, **both Windsor Creek (49 µg/L) and Cranberry Creek downstream of Cranberry Marsh (45 µg/L) had much higher average TP concentrations than the Wasi River** (near its outlet) at W11 (35 µg/L).

- Approximately **65% of the TP discharged from the Callander sewage lagoons into Cranberry Creek is assimilated by Cranberry Marsh**.

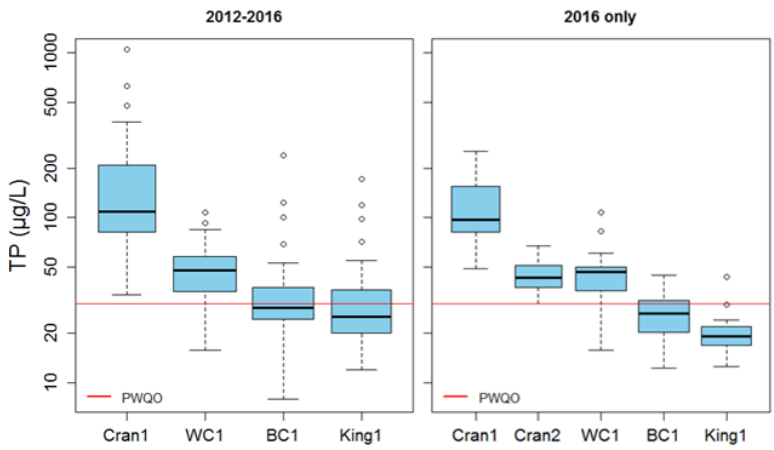


Figure 4. TP concentrations (on log axis) of Cranberry Creek (upstream (Cran1) and downstream (Cran2) of Cranberry Marsh), Windsor Creek (WC1), Burford Creek (BC1), and an unnamed creek in Callander (King1).

In-stream Phosphorus Loadings

- **Stream P loading to Callander Bay,** from the Wasi River and other monitored tributaries, is estimated to be ~**4,600 kg/yr**, based on available data.
- Approximately **81% of the estimated TP loading is from the Wasi River;** of this, ~31% (i.e., 25% of the total) is contributed by Graham Creek.

Wasi Lake

- **Wasi Lake can be classified as eutrophic** (nutrient rich), based on its mean TP concentration of 30 µg/L for the ice-free period.
- The **TP concentration of Wasi Lake shows pronounced seasonal variation**, increasing throughout the ice-free season.
- There is **no significant interannual trend in the median TP concentration or water clarity** of Wasi Lake, based on the 8-year period of record available.
- **Wasi Lake is polymictic**, i.e., does not exhibit stable vertical stratification that persists throughout the summer. However, periods of **transient stratification result in rapid oxygen depletion near the sediments**.
- The **sediments of Wasi Lake are a net source of P to the lake during May to Oct**. During the ice-free period, the P that is retained by the lake (from upstream inputs) enriches the water column, not the sediments. For these reasons, the TP concentration within the lake increases steadily throughout the ice-free period.

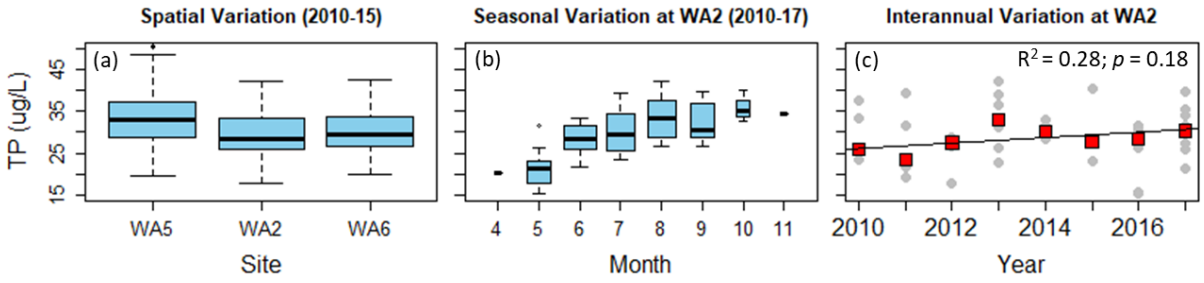
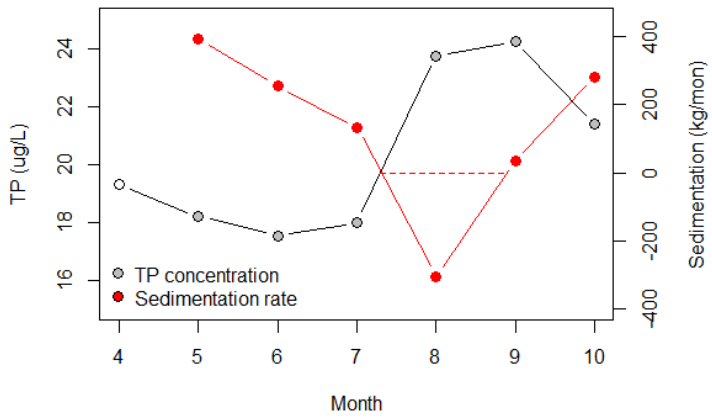


Figure 4. (a) Spatial, (b) seasonal, and (c) yearly variation in TP within Wasi Lake. There is no significant trend in the annual median TP concentration. In (b), width of boxes indicates # data/month (1 in Apr, Nov).

Callander Bay

- **Callander Bay can be classified as meso-eutrophic** (moderately enriched), based on its mean TP concentration of 19 µg/L for the ice-free period.
- In Callander Bay, the **TP was generally highest in Aug and Sep.**
- The annual median **TP concentration in Callander Bay has been declining** over the past 15 years. The average rate of decrease was 0.3 mg/L/yr (~1.5% per year) during 2003 to 2017. There was **no trend in water clarity** detected.
- **Callander Bay is polymictic**. However, periods of prolonged stratification, such as in July 2017, can result in sediment anoxia and **internal loading of P, Fe**, and likely other redox-sensitive elements. The **sediments appear to be a P sink for most of the year, but a P source in August (see Figure 6).**
- Based on a comparison of 2016 and 2017, there can be **substantial inter-annual variation in the phytoplankton community** of Callander Bay.
- When cyanobacteria dominated the phytoplankton community in Callander Bay, such as in Aug-Sep 2017, the **major biomass contributors were the filamentous, nitrogen-fixing, potentially-toxic genera *Anabaena* and *Aphanazominon*.**
- The **2017 cyanobacterial bloom in Callander Bay appears to have been triggered by internal nutrient loading** following a period of sediment anoxia due to prolonged water column stratification.
- **Wind appears to control the spatial distribution of cyanobacteria** in the surface waters of Callander Bay.

Figure 6. Based on sedimentation rate estimates from a simple mass-balance model (red dots), the sediments of Callander Bay are a net source of P in August but a sink during other months of the ice-free period. TP concentrations (grey dots) are monthly means for the period 2002-17; TP was calculated for Apr (open dot) using data from early May and 1 datum from Apr (2002).



Discussion

The following is a discussion of what has been learned about the nature and magnitude of catchment P loading, in-lake spatiotemporal dynamics of temperature, oxygen, nutrients, and phytoplankton, the management implications of this knowledge, and directions for further research.

Catchment P Loading

Nutrient sources to waterbodies are conventionally divided into point sources (e.g., wastewater treatment plants) and nonpoint sources (e.g., agriculture). P loading to Callander Bay is dominated by nonpoint sources, with the only (known, monitored) point source (the Callander sewage lagoons) estimated to contribute less than 5% of the total annual P load (although much of this P is likely to be in a highly bioavailable form). The Wasi River is estimated to account for 81% of the catchment load, of which 31% is from Graham Creek, one of its tributaries. The highest TP concentration was measured downstream of the Callander wastewater lagoons (avg. of 166 µg/L) in Cranberry Creek. The second highest TP concentration (avg. of 54 µg/L) was measured in Windsor Creek, which was estimated to contribute 10% of the annual TP load. The Graham Creek and Windsor Creek drainage areas have comparatively high agricultural use and erodable soil in their mid-to-lower regions, relative to areas upstream of sites with lower TP, where the land is predominantly forested (e.g., upstream of sites C1, G2, or W2).

The total annual P loading from monitored streams estimated in this report is 4607 kg/yr. This number is ~20-30% lower than the 5527 kg/yr (assuming 74% attenuation of septic system P by soils) or 6426 kg/yr (0% attenuation) estimated by HESL (2011) using an export-coefficient modelling approach. Ver, given that the HESL (2011) P budget included some additional terms and some areas not monitored by NBMCA, the comparison suggests that the HESL (2011) estimates are reasonably accurate.

Anecdotal evidence (e.g., conversations with lakeshore residents) suggests that septic systems are perceived as an appreciable source of P to local lakes. “The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage” is one of 22 activities prescribed in

s.1.1 (1) of O. Reg 287/07 of the Clean Water Act. As per Monitoring Policy M11-CAS of the North Bay-Mattawa Source Protection Plan (NBMCA 2015), septic systems within the Callander ICA are now subject to mandatory maintance inspections (once every 5 years) to ensure they are in "substantial compliance with the operation and maintenance requirements" of the Ontario Building Code (O. Reg. 350/06; NBMCA 2014). It is well established that septic system effluent, like most wastewater, is rich in P (Robertson 2003); however, what is not well known is what proportion of this P makes its way from the septic bed to adjacent surface or groundwater. This uncertainty was acknowledged by HESL (2011), who presented 2 separate estimates of P loading from septic systems, 1215 kg-P/yr (19% of total) or 316 kg-P/yr (6% of a (lower) total), based on assuming either 0% or 74% attenuation, respectively, of septic P by soils. At least one scientific study (Robertson 2003) has found that P is not mobile (i.e., would not be expected to migrate from a septic bed to adjacent surface or groundwater) under acidic soil conditions, such as are commonly found in the Canadian Shield, because, at low pH, aluminum is present in ionic form, and the Al^{3+} binds PO_4^{3-} (provided the tile bed is functioning properly, and oxidation reactions can proceed in the effluent). There remains uncertainty regarding the quantitative importance of septic effluent as a P source to Callander Bay (or other waterbodies in the area).

Continuous turbidity monitoring conducted at the Wasi River near Astorville WSC hydrometric gauge (NBMCA site W10) has revealed a strong correlation between TP concentration and turbidity (an optical measure of suspended particles), suggesting that soil erosion is a significant contributor of P to the water during high flow events. High particulate P loading during high-flow conditions is a common water quality issue in areas with erodable soils, and its importance within the Callander Bay ICA was noted over 30 years ago by the authors of the Wastiwasing River Manangement Study (The Environmental Applications Group Ltd. and A.J. Robinson & Associates, Inc., 1986) who wrote that "…when major storms bring in high flows from the Wasi River, these waters are loaded with nutrients" and that "erosion in Graham Creek continues to be a problem." More recently, a fluvial geomorphology study of the Wasi River subwatershed noted a number of locations at which erosion is likely to contribute significant sediment (and therefore sediment-bound P) to the river, as well as potential mitigation measures such as widening riparian buffer strips, installing coir logs, resizing and/or realigning culverts, and other options (Waters Edge 2016).

While erosion is clearly a significant contributor of P to Callander Bay, the majority (~60%) of the P in the Wasi River and other tributaries of Callander Bay (when monitoring was conducted) was present in dissolved (<0.45 µm), rather than particulate (>0.45 µm) form.This is consistent with the predominance of wetlands in the ICA (~23%) and the relatively high DOC (dissolved oxygen) content of the water in the Wasi River (10 mg/L; PWQMN data for 2004-17). Taken together, these observations suggest that natural export of P from wetlands is a major source of P to Callander Bay, at least during periods of modest streamflow (i.e., as opposed to after rain events). This is consistent with the findings of HESL (2011), who estimated range of 57-67% natural P loading corresponds closely to the range of %DP

(percent dissolved phosphorus) commonly observed by NBMCA. This does not imply that P loading to Callander Bay cannot be reduced by effective management strategies; however, it is important to recognize that even in the absence of anthropogenic influences in its catchment, Callander Bay would likely still be a mesotrophic system.

In-Lake Processes

Callander Bay is a polymictic system; i.e. it does not exhibit stable water column density stratification over the entire summer in the same way a deeper lake such as Trout Lake does. However, the high-frequency data collected at the Nipissing University monitoring buoy show that when air temperatures are high enough, Callander Bay does stratify for up to weeks at a time, and that during such prolonged periods of water column stratification, oxygen becomes depleted above the sediments. The nutrient and phytoplankton data collected by Nipissing University suggest that this sediment anoxia leads to internal loading (i.e., a flux from the sediment to the water column) of dissolved P and Fe, that in turn stimulate cyanobacterial blooms (such as was observed in 2017). The seasonal mass balance P modelling exercise presented in this report support this model – the sedimentation rate was estimated to be negative (and relatively large in magnitude) in the month of August, suggesting a significant flux of P from the sediments to the water column (i.e., internal P loading) in the late summer, when cyanobacterial blooms tend to occur.

Management Strategies

A wide variety of strategies exist for managing lakes subject to harmful cyanobacteria blooms (Ibelings et al. 2016). Such strategies can be broadly divided into mitigation strategies that “treat the symptom” (i.e., in-lake treatments) vs. preventative strategies that “treat the disease” (i.e., reducing external nutrient loading). The choice of management strategy will reflect the time-scale over which results are desired, the severity of the problem, the characteristics of the affected lake and its catchment, and the funds available.

The research conducted in Callander Bay suggests that, on a seasonal timescale, the blooms are triggered by periods of sediment anoxia which cause internal loading of soluble P (and other elements, such as ferrous iron). Callander Bay is too large (~12 km^2) for the sediments to be dredged. Hypolimnetic aeration or the addition of P-binding agents (e.g., Phoslock) would likely be effective if applied to all areas where sediment anoxia is prevalent – more research would be needed to establish the spatial extent of sediment anoxia; the feasibility of either measure would depend largely on the size of the anoxia-prone area, which would largely dictate the funds required for treatment. If the blooms are in fact being triggered by internal loading of ferrous iron (rather than P), application of Phoslock or other P-binding agents would not likely be effective in suppressing the cyanobacterial blooms.

Other in-lake strategies such as foodweb manipulation and algicide application are of questionable effectiveness and can have unintended consequences for the ecology of the system. Hydrological manipulation is not likely to be an effective option, and is not realistic given that the water level of the bay is largely controlled by the water level of Lake Nipissing, which is regulated by the French River dam (operated by Public Services and Procurement Canada).

In general, even if feasible and effective, any in-lake measure is unlikely to be sustainable in the long term if catchment nutrient loading is not reduced sufficiently (Hamilton et al. 2016). HESL (2011) suggested a large list of BMPs to help mitigate P loading to the bay (see their Table 14). Through its Restore Your Shore program, NBMCA has conducted shoreline plantings at various locations in the ICA, where property owners were willing to have their shorelines planted. Continuing to create and enlarge riparian buffer zones, especially in areas where zones of riparian vegetation are narrow or absent, and/or in areas where erosion is particularly problematic, such as in the Graham Creek catchment, would be benefical. Agriculture and Agri-Food Canada recommends that riparian buffers should be 5 m wide for bank stability, 10-30 m for sediment removal, and 10-300 m for wildlife habitat. Outreach to the agricultural community should continue, and focus on creating/maintaining riparian buffers, keeping livestock out of watercourses, and best practices for fertilizing crops (timing of application, nutrient ratios, etc.).

One of the aforementioned strategies for dealing with catchment P loads is diversion. Diverting the Callander wastewater lagoons to Lake Nipissing would decrease the loading to the bay by ~5%. While such a percentage may seem small, if the *natural* loading is assumed to represent 60%, this change would decrease the *anthropogenic* loading by approximately 13%. Furthermore, the P in the wastewater is likely of a highly bioavailable form (e.g., free orthophosphate or small organic molecules containing P vs. particle-bound P) so this change could have a more significant positive impact on the ecology of the bay than might be suggested by a P budget based solely on mass loadings. Some alteration to the fluvial geomorphology in the ICA could also help to reduce nutrient loads to the bay. The substantial decrease in turbidity observed between sites W10 and W11 following a rain event suggests that restoring a more natural, meandering shape to the Wasi River (or other watercourses), and allowing connection between the river and its floodplain (where sediment deposition can take place), would be beneficial in reducing the suspended sediment (and P) load to Callander Bay.

Further Research

NBMCA now has ample data on P concentrations in the Callander ICA when streamflows are in a low to moderate range. Less data has been collected during high-flow conditions such as freshet (i.e., in April) and after large rain events. April James (Nipissing University) and her students/technicians continue to collect P data from site W10, specifically targetting high-flow events, which will help in filling this data gap. However, the comparison of turbidity at sites W10 vs. W11 suggests that data collected at W10 following

high-flow events may not be representative of what enters Callander Bay, due to appreciable sedimentation of suspended solids between W10 and the Wasi River's outlet. More information on TP loading to Callander Bay (i.e., TP concentrations at W11 not W10) during high flow events would be beneficial.

To date, our understanding of vertical temperature and oxygen dynamics in Callander Bay have largely been based on data collected near the centre/deepest part of the bay. The effectiveness of hypolimnetic aeration or P-binding techniques will in part depend on the spatial distribution of sediment anoxia and internal loading. Maintaining oxic conditions at the sediment-water interface near the centre of the bay will not have an appreciable effect if sediment anoxia in the littoral zone (shallow areas), including Cranberry Marsh, is a significant contributor to internal loading (for instance, on very calm days). A dissolved oxygen probe could be moored near the outlet of the marsh to determine whether the marsh becomes anoxic at night (when photosynthesis stops but respiration continues to consume oxygen). Water samples could be collected from near the marsh outlet in the early morning, or dialysis bags could be deployed to quantify nocturnal P loading from the marsh sediments. Robyn Jones (Nipissing University) has conducted some spatial surveys of DO and temperature that should help to characterize the areal extent of sediment anoxia within the bay.

Future monitoring of Callander Bay and Wasi Lake should include quantification of phytoplankton biomass and taxonomy as routine parameters, given that the water quality issue of importance is excessive biomass of a particular phytoplankton taxon. Ideally, this should be accomplished by collecting samples for microscopic examination by a trained phytoplankton taxonomist. A more cost-efficient alternative is to infer phytoplankton biomass and community composition based on fluorometric measurements (e.g., FluoroProbe and/or Hydrolab HL7 sonde).

Acknowledgements and References can be found in Appendix 1 "Callander Bay Issue Contributing Area Monitoring Report 2009-2017".

Conclusion: Land use policies should be reviewed and changes to the SP Plan may be needed. Education about related land use policies in the SP Plan may be required. Modifications to the monitoring program as noted in the 'Further Research' discussion above should be implemented to enhance the understanding of factors contributing to P loading in the Callander Bay ICA. Current education policies are effective are managing their respective activities, although discussions with implementing v=bodies should occur to ensure that outreach activities are cost-effective and continue to reach affected property owners. No changes to the AR are need under this factor.

2.2.I: Other local considerations

Improved watercourse layers and floodplain mapping are available for the intake protection zones and ICA. Mapping products in the Assessment Report will be updated to ensure areas subject to SP Plan policies are accurately depicted.

A review of the factors used to determine the vulnerability score for the Trout Lake IPZ has been conducted. It was the opinion of the review team that the score assigned currently may be lower than it should be. Using the revised watercourse data noted above, the original scoring will be revisited to check if any of the factors should be changed. Should this change the vulnerability score of one or more of the intake protection zones, the text and mapping in the Assessment Report would be changed. Significant drinking water threats may be identified and policy changes or additions may be need in the SP Plan.

Conclusion: Modifications to AR maps will be made to reflect improved stream data. The Trout Lake IPZ score will be reviewed. The AR may need to be changed to show the revised score and policies may need to be modified in the SP Plan to address threats.

3. Proposed Review and Updates

Based on the preliminary analysis, consultations with various stakeholders, and feedback from the MECP on the draft proposal, the North Bay-Mattawa River SPA recommends that updates as described below be carried out under s.36 of the *Clean Water Act*, 2006. Most of the proposed updates result in revisions to both the AR and SP Plan.

The updates have been organized into three categories:

- Tasks related to the s.36 order
- Items resulting from changes to Technical Rules or other guidance
- Extension of knowledge or new science

A discussion about each update is provided in this section. Table 3 in the next section shows a summary of the updates.

3.1. Tasks Specified in s.36 Order

The Minister issued an s.36 order in March 2015. Three workplan items stem from the s. 36 order.

3.1.1 Update 1: Education and Outreach Policies

Education and outreach policies will be reviewed by the SPC in conjunction with municipalities. The review will consider the effectiveness of the current policies at addressing threats and determine if what sections of policy may be changed to ensure effectiveness, facilitate implementation and adjust for any new or revised threat activities in affected vulnerable areas.

Updates to the SP Plan will be completed by the North Bay- Mattawa SPC by December 2019 with support from the North Bay-Mattawa SPA.

3.1.2 Update 2: Land Use Planning Policies

Land use planning policies will be discussed by the SPC and effected municipalities. The review will consider modifications to the land use policies and additional policies or both to ensure implementing bodies can manage threat activities with the policy approach.

This update to the SP Plan policies will be completed by the North Bay- Mattawa SPC by December 2019 with support from the North Bay-Mattawa SPA.

3.1.3 Update 3: Analysis of Callander Issue Contributing Area (ICA) Phosphorus Research

The Callander ICA for phosphorus will be one of the kore complex updates in this s.36 workplan. A report is being compiled by the North Bay-Mattawa SPA which summarizes many years of data on phosphorus and other parameters associated with the blue-green algae blooms (cyanobacteria). The research summary may help to inform where policies may be refined to better address the issue and what additional research may assist in further the understanding of the principal contributing factors to phosphorus loading within the ICA.

Updated watercourse layers and information about transport pathways, such as drains, ditches and tiling, can be used to more accurately depict the extents of the ICA and, hence, the area to which SP Plan policies apply. The AR must be updated for mapping and threat risk assessment. The SP Plan policies may also need to be updated to utilize the research findings.

These updates will be completed by the North Bay Mattawa SPC by February 2020 with support from the North Bay-Mattawa SPA and affected municipalities.

3.2. Items Resulting from Changes to Technical Rules or Other Guidance

Based upon the preliminary analysis, the AR and SP Plan need to be updated for several items to remain compliant with the current Tables of Drinking Water Threats, Technical Rules and other Ministry guidance.

3.2.1 Update 4: Hydrocarbon Pipeline as a Prescribed Threat

Hydrocarbon pipelines have been added a prescribed threat in the regulations. There was a proposal in the recent past to establish an oil pipeline within an intake protection zone in the North Bay-Mattawa SP Area. The Assessment Report and SP Plan text should be revised to include this new prescribed threat with circumstances specified in the Tables of Drinking Water Threats. The SPC should discuss appropriate policies to address hydrocarbon pipelines for inclusion in the SP Plan.

This update to the AR and SP Plan policies will be completed by the North Bay- Mattawa SPC by December 2019 with support from the North Bay-Mattawa SPA.

3.2.2 Update 5 Assess Occurrence of Above-grade Fuel Storage

The Tables of Drinking Water Threats were revised to add the above-grade storage of fuel in quantities over 2500L would be a significant drinking water threat for IPZs with a vulnerable score of 9 or higher. From previous threat enumeration exercises, it is anticipated that there are existing activities with these circumstances. An updated review of activities in these vulnerable areas should be conducted and modifications be made to AR as necessary. The activity will need to be addressed in SP Plan either by modifying the wording in existing policies or creating new policies.

Fuel storage updates will be completed by the North Bay- Mattawa SPC by December 2019 with support from the North Bay-Mattawa SPA.

3.2.3 Update 6: ASM, NASM and Livestock Threat Policies

The North Bay-Mattawa SP Plan contains policies that effectively prohibit, through land use planning, certain agricultural activities which could be significant drinking water threats. As noted above, the implementing body is unsure of the ability to manage these activities through land use planning tools. A review of the policies is warranted to ensure there are no gaps or implementation problems. The preliminary analysis above notes that there are no undue impacts placed on the agricultural community by the continued inclusion the policies.

A review and possible update to the land use planning policies will be completed by the North Bay- Mattawa SPC by December 2019 with support from the North Bay-Mattawa SPA and in concert with local planning authorities.

3.2.4 Update 7: Climate Change Adaptation

Sections of the AR will be reviewed to incorporate current climate model consensus. A climate change review would include a literature review of local climate projections as well as an analysis of how these may alter technical study assumptions and impact upon water quality and quantity for drinking water systems.

The climate change analysis will be completed by the North Bay Mattawa SPC by February 2020 with support from the North Bay-Mattawa SPA and following guidance from the MECP and Conservation Ontario.

3.2.5 Update 8: Significant Groundwater Recharge Area Vulnerability Scoring

The Technical Rules were changed in November 2017 regarding significant groundwater recharge areas. While the SGRAs are still identified as part of the technical background information in the Assessment Report, scoring is no longer applied. As a result, maps in the Assessment Report and related text will be altered.

These updates will be completed by the North Bay Mattawa SPC by October 2019 with support from the North Bay-Mattawa SPA.

3.2.6 Update 9: Align policy wording with updated 'short names' for Drinking Water Threats

Policy wording the SP Plan will be aligned with the updated 'short names' of drinking water threats from the Tables of Drinking Water Threats.

These updates will be completed by the North Bay Mattawa SPC by November 2019 with support from the North Bay-Mattawa SPA.

3.3. Tasks Related to Extension of Knowledge or New Science

Improvements can be made to the SP Plan and AR as new information becomes available or potential threats or issues are identified. These help to keep the SP Plan current and based upon the best available science.

3.3.1 Update 10: Trout Lake IPZ Extent and Scoring

A refined watercourse layer is now available and will be used to update the extent of the Trout Lake ICA. The vulnerability scoring will be re-evaluated, which may result in an increased value. Potential threat activities in the AR may be reassessed and policy changes or new policies may be required to address activities not previously considered significant drinking water threats.

Updates to the AR will be completed by September 2019 and any revisions to the SP Plan will be completed by January 2020 by the North Bay Mattawa SPC with support from the North Bay-Mattawa SPA.

3.3.3 Update 11: Transportation Threats for All Systems

The table of circumstances for the local threat of transportation of hazardous goods may address the large volumes being transports on transportation corridors in the SPA. The SPC will ask the MECP to either evaluate larger volumes of certain chemicals of concern as additional lines on the threats table or all as an alternative approach the events-based modelling of spills so as to delineate an events-based area. If approved for use, the threats would be evaluated, changes to the AR mapping and text would be made, and SP Plan polices may need to modified or new polices developed.

Changes to the AR would be completed by the North Bay-Mattawa SPC with support from the North Bay-Mattawa SPA and in consultation with the MECP, MTC and ONTC. The target for this part of the update would be October 2019. Changes to the SP Plan polices would be made by February 2020.

3.3.4 Update 12: Policy Review Where Implementation Complete

The implementation of some SP Plan policies had a specified timeframe and the policies have been implemented. A review of the policies will be conducted to modify the wording so that it speaks to existing and future requirements and removes reference to any that have been accomplished.

The SP Plan update will be completed by the North Bay Mattawa SPC by October 2019 with support from the North Bay-Mattawa SPA.

3.4 Project Management and MECP Support for Updates

The MOECC provides support through its capacity funding under the DWSP program, technical bulletins, guidance, and feedback. This support for local program delivery is gratefully acknowledged.

The North Bay-Mattawa SPC with support by the North Bay-Mattawa SPA will lead the updates to the SP Plan including the Assessment Report. The continuation of support by MECP will be necessary to undertake the proposed updates under s.36 and the required consultation. This includes SPA staff capacity and expertise, SPC meetings, municipal implementation working group meetings, and stakeholder engagement workshops prior to submission of an updated SP Plan including the AR. The North Bay-Mattawa SPA recommends that staff levels be slightly increased from those provided under the 2018-2019 Transfer Payment Agreement with the Province in order to carry out the proposed updates through March 2020.

4. Summary of Projects, Timelines and Costs

Table 3 provides a detailed listing of the proposed updates in the s.36 workplan. Besides the information described in section 3 above, a 'level of effort' has been assigned. The intent is to give an indication of the relative complexity of the tasks and the proportion of SPA staff times and resources that will be utilized.

Consultation will also form an integral part of the s. 36 updates. Communication with implementing bodies, municipal staff and councils, affected landowners and the general public will occur throughout. Workshops, open houses, web postings, social media, media releases, and other tools will be utilized. A communication plan will be developed as one of the first steps in the workplan process.

The North Bay-Mattawa SPC North Bay-Mattawa SPC with support from the North Bay-Mattawa SPA will complete a communications plan by January 2019.

Table 3. Summary of Identified Source Protection Document Review Projects					
Update No.	Description of Proposed Review and Update	Applicable Document	Key Participants	Timeline for Completion	Resource Requirement
Tasks specified in s.36 order					
1	Education and outreach policies: - analyze effectiveness of education and outreach policies in addressing significant drinking water threats	SP Plan for any policies	NBMSPA (Lead) SPC Municipalities	December 2019	Moderate
2	Land use planning policies: - modify wording of policies to ensure effectiveness in managing or prohibiting prescribed threats	SP Plan for any policies	NBMSPA (Lead) SPC Municipalities	December 2019	Moderate
3	Callander Issue Contributing Area (ICA) - analyze cumulative results of Callander ICA phosphorus research; - refine ICA extents using additional and more current watercourse and pathway information; - possible changes or additions to policy suite	AR for assessment; SP Plan for any policies	NBMSPA (Lead) SPC Municipalities Academia	Early 2019 – data review February 2020 – policy review	High
Items resulting from changes to Technical Rules or other guidance					
4	Hydrocarbon pipeline as a prescribed threat: - assess if significant threat in vulnerable areas; - determine if policies should be added to SP Plan	AR for assessment of pipeline risk; SP Plan for any policies	NBMSPA (Lead) SPC	December 2019	Low

Table 3. Summary of Identified Source Protection Document Review Projects					
Update No.	Description of Proposed Review and Update	Applicable Document	Key Participants	Timeline for Completion	Resource Requirement
5	Above-grade fuel storage: - assess occurrence of above-grade fuel storage in amounts >2500L where it would be a significant threat (i.e. IPZs and WHPAs scoring 9 or higher)	AR for assessment; SP Plan for any policies	NBMSPA (Lead) SPC Municipalities	December 2019	Low
6	ASM, NASM and Livestock threat policies: - review wording of policies for agricultural source material (ASM), non-agricultural source material (NASM) and livestock threats; - ensure polices are effective and can be implemented; - confirm that policies do not prohibit these activities except in certain vulnerable areas	SP Plan for any policies	NBMSPA (Lead) SPC Municipalities	December 2019	Moderate
7	Climate change adaptation - review sections of AR to incorporate current climate model consensus	AR for discussion	NBMSPA (Lead) SPC MECP Conservation Ontario Municipalities Academia	February 2020	Moderate

Table 3. Summary of Identified Source Protection Document Review Projects					
Update No.	Description of Proposed Review and Update	Applicable Document	Key Participants	Timeline for Completion	Resource Requirement
8	Significant groundwater recharge area vulnerability scoring: - update mapping and text to remove scoring (as per March 2017 Technical Rule changes)	AR text and maps	NBMSPA (Lead) SPC	October 2019	Low
9	Align policy wording with updated 'short names' in the Tables of Contents of the Tables of Drinking Water Threats.	SP Plan for any policies	NBMSPA (Lead) SPC	November 2019	Low
Extension of knowledge or new science					
10	Trout Lake IPZ extent and scoring: - check IPZ extents based upon refined watercourse layer; - re-evaluate vulnerability scoring; - update mapping as required; - review potential threat activities; - consider if policy changes or additions are needed	AR for mapping and text; SP Plan for any policies	NBMSPA (Lead) SPC Municipalities Academia Community partners	September 2019 - scoring and mapping January 2020 – policy review	High

Table 3. Summary of Identified Source Protection Document Review Projects					
Update No.	Description of Proposed Review and Update	Applicable Document	Key Participants	Timeline for Completion	Resource Requirement
11	Transportation threats for all systems - seek Director approval to use EBA (events-based area) approach; use EBA to identify and delineate areas near intakes that are vulnerable to spills from transportation of hazardous goods by rail or highway; OR - seek revision to Director approval of local threat related to transportation; additional lines on threat table to evaluate higher volumes of specific chemicals of concern - consider possible changes or additions to policy suite	AR for assessment; SP Plan for any policies	NBMSPA (Lead) SPC MECP Municipalities MTO Ontario Northland Transportation Commission	October 2019 – threat assessment February 2020 – policy review	High
12	Policy review where implementation complete: - review wording of policies that have been effectively achieved; - consider revisions to ensure maintenance of initial outcome	SP Plan for any policies	NBMSPA (Lead) SPC	October 2019	Low
Communications					
	Communications Plan Development and Delivery: - determine approaches to be used, audiences, timelines, resources, and metrics	Mapping and text changes in AR; Policy revisions in SP Plan	NBMSPA (Lead) SPC	January 2019 – develop communications plan November 2018 through March 2020 and beyond – delivery	High

5. Conclusion

Since the approval of the Source Protection Plan in March 2015, significant progress has been made to effectively implement the policies. Upon analysis of research activities, technical rule changes, new data, and implementation experience, multiple areas of the SP Plan and Assessment Report warrant additional review and possible modifications to these documents. A total of twelve projects have been identified for inclusion in this s. 36 workplan. The timeline for completion of all proposed updates is February 2020. Consultation will be conducted as part of the workplan process to gather input from implementing bodies, other agencies and the general public. The North Bay-Mattawa SPC will complete the proposed changes with support from North Bay-Mattawa SPA staff, and in consultation with the MECP, applicable implementing bodies and municipalities.

6. References

1. Ministry of the Environment and Climate Change, December 2016. Source Protection Plan Bulletin - Overview of Requirements for Assessment Report and Source Protection Plan Amendments under S. 36 of the Clean Water Act.
2. Ministry of the Environment and Climate Change, December 2016. Source Protection Plan Bulletin - Overview of Requirements for Assessment Report and Source Protection Plan Amendments under S. 36 of the Clean Water Act.
3. North Bay-Mattawa Source Protection Committee. North Bay-Mattawa Source Protection Plan. Approved March 5, 2015.

Appendices

Appendix A: s.36 Order from Minister of the Environment and Climate Change

Placeholder

Appendix B: Maps

Placeholder

Appendix C: Workshop stakeholder input

Placeholder

Appendix D: Draft workplan comments and responses

Placeholder