Vermilion River Stewardship

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To Mayor and City Council Members
By Email:

Re: Simon Lake Community Stewardship Group's
HCI Grant Request to Purchase an Algae Skimmer

The Vermilion River Stewardship (VRS) is writing to express concern over an HCI Grant Application by the Simon Lake Community Stewardship Group (SLCSG), requesting that the City of Sudbury purchase a mechanical harvester to remove algae from Simon Lake.

The VRS is concerned that a mechanical harvester, with its large agitating paddle wheels and skimming apparatus, has the potential to stir up heavy metal and nutrient contaminated lake bottom sediment, and to spread Eurasian Milfoil, from Simon and McCharles Lakes, into the downstream reaches of the Vermilion River system. VRS recommends a long-term solution, rather than a short-term band aid solution, be undertaken to address the green algae blooms.

The VRS clearly recognizes the serious concerns of the SLCSG, however; we urge caution in the City's approach to mitigating the algae issue. VRS agrees that action must be taken by the City of Sudbury to resolve the long-standing issue of algae blooms once and for all; however, we differ in the recommended approach.

Recommendation:

It is imperative that the City of Sudbury put into action a long-term solution to the algae problems that have plagued Simon Lake and its residents for many years. VRS recommends:

1. Priority upgrades and capacity built into stormwater and wastewater management that will significantly focus on improving wastewater treatment and preventing sewage bypass events.
2. Any short-term approach to removing algae from the lake should not place the downstream riverine ecosystem at risk of further proliferation of invasive species or contamination.
3. A vacuum and boom approach to remove algae should be explored as a short-term solution, and any decision to move forward come only after full community consultation and social licence from all stakeholders, including those living downstream.

Background:

As anyone who has visited or lives in the vicinity of Simon Lake will testify, the large floating masses of rotting algae blooms restrict access to the shoreline for swimming, fishing, boating, and normal summer activities, and result in extremely foul odors that plague the residents of Simon Lake every summer.

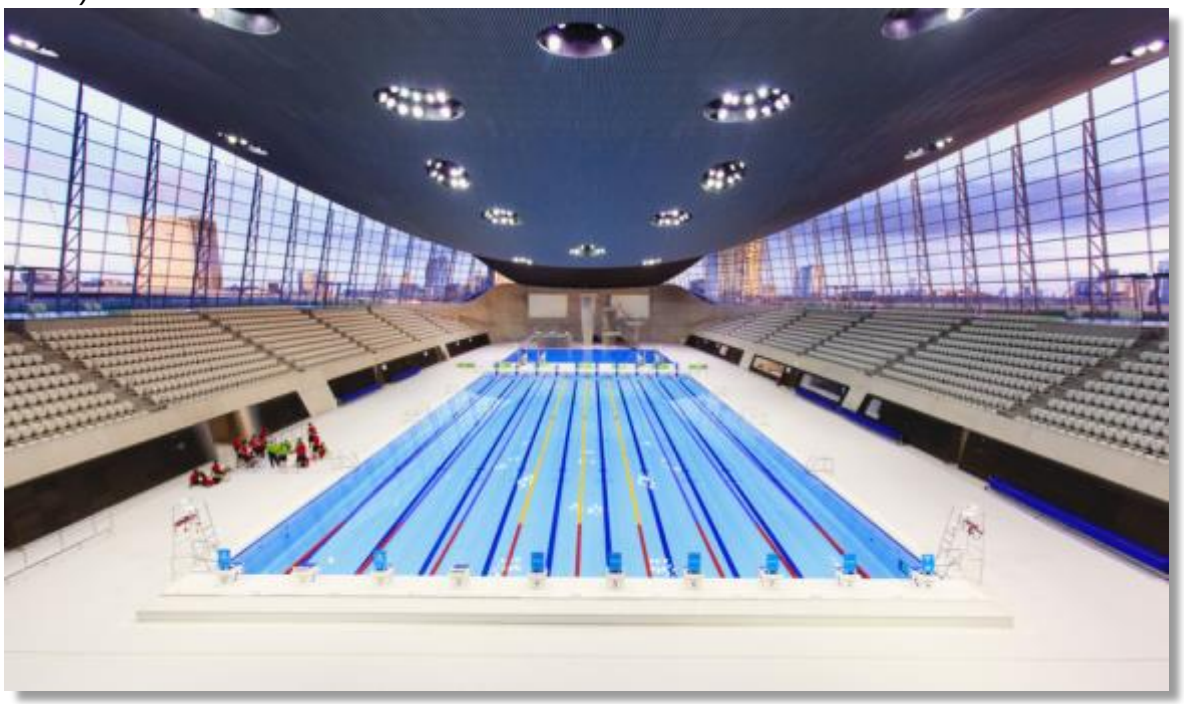
The algae were identified by the Ministry of Environment in 2007 as predominantly the green alga Hydrodictyon; however, other species of algae are also present. None of the algae confirmed to date on Simon Lake poses a threat to health; however, toxic Cyanobacteria has been confirmed on several occasions on McCharles Lake. The foul odors emanating from these lakes during the hot summer months, as well as the aesthetics of it, hampers enjoyment of the lake, lowers property values, and make resale challenging.

Nutrients

In 2006-7[1] and again in 2013[2], Ecojustice reported that the City of Sudbury had the 5th highest volumes of untreated and undertreated sewage released into the environment in Ontario. VRS acknowledges the excellent work of our City wastewater staff – they are top notch, and do the best they can with the funds available; however, there must be substantial investment and movement towards effective mitigation of the bypass events that are releasing large volumes of raw sewage into the Junction Creek and Vermilion River system.

Kelly, Mud, Simon, and McCharles Lakes, on the lower Junction Creek, continue to be heavily impacted by 3 municipal and 2 industrial wastewater treatment facilities. High phosphorus levels have been attributed to the historic and present day releases of untreated, undertreated and treated sewage directly into the lower Junction Creek system.

In March of this year alone, 227,714m^3 of undertreated and untreated wastewater was released from the Sudbury, Lively and Naughton WWTFs. Additionally, the Val Therese, Chelmsford and Azilda WWTFs also bypassed treatment that month, with a combined sewer bypass total of 297,821m^3 – the equivalence of **297 Olympic-sized swimming pools** (50m x 25m x .80cm= 1,000m^3).



Annual total bypass events for Sudbury WWTFs**:**

2015 – 230,804 m^3
2014 – 763,862 m^3
2013 – 442,368 m^3

Our VRS water quality study demonstrated that, with few exceptions, phosphorus levels on Mud, Simon and McCharles Lakes exceeded the Provincial Water Quality Objectives (PWQO) in 2013, 2014 and 2015 – and on occasion phosphorus levels were several times over the PWQO.

Additionally, lake bottom sediments are nutrient and heavy metal enriched and, under anoxic conditions, can release bioavailable nutrients that fuel the growth of algae blooms. However, studies also show that despite historic concentrations of phosphorus in the sediment, that by simply reducing the phosphorus input, a proportional abatement in phytoplankton blooms and other symptoms of eutrophication occurs[3].

In a seminal paper in limnology, A.D. Hasler reported on dramatic changes occurring in lakes across Europe and the United States in the early 1900s in response to nutrient enrichment from domestic sewage (Hasler 1947)[4]. Hasler described the case histories of formerly oligotrophic lakes that were overcome with "obnoxious scums of algae" that discolored the water and produced foul odors, and whose decomposition reduced bottom water oxygen to concentrations intolerable by fish. Eutrophication remains today one of the foremost threats to the health of freshwater ecosystems (Smith et al. 2006[5], Schindler 2006[6]), as it degrades the value of freshwater ecosystems to humans and wildlife.[7]

Scientists have long known that phosphorus, and to a lesser degree nitrogen, fuels the growth of algae in lakes and streams; therefore, the long-term management of algae must involve nutrient reduction to the water body.[8] It is imperative that City Council make meaningful wastewater and stormwater infrastructure upgrades a priority when budgeting and applying for federal and provincial grant monies.

Climate Change

On September 20, 2016, 375 members of the National Academy of Sciences, including 30 Nobel laureates, published an open letter to draw attention to the serious risks of climate change. The letter signed by many of the world's leading climate scientists, represents a clear and dire warning from scientists to politicians: The earth is on the verge of a tipping point where increasingly severe physical, human and economic shock waves from climate change are imminent.

A rise in extreme rain events are already degrading water quality, and changes in timing and location of precipitation combined with rising levels of water pollution will strain ecosystems and threaten the survival of fish and wildlife species. These shifts are having dramatic impacts on communities, threatening public health, weakening economies, and decreasing the quality of life in many places. The consequences of shifting weather patterns will depend in large part on the choices that communities have made in the past and are making now.

Cities that do not take steps to safeguard their water supply and fail to address aging infrastructure will experience greater increases in stormwater runoff and sewer overflows. Most importantly, communities that have done the greatest damage to their natural infrastructure – wetlands, forests, streams and rivers will have fewer defenses to protect them against a changing climate. Decisions related to land use planning, flood protection, water infrastructure, and many other facets of community life have a profound impact on a community's vulnerability

in a warming world and play a large role in determining the degree of impact on water quality and water quantity.

Adaptation to the extremes of climate change requires smart planning, and building resilience into built and natural infrastructure through the use of rain gardens, bioswales, permeable surfaces, stormwater catchments, and the protection of our streams, rivers, lakes, and wetlands.

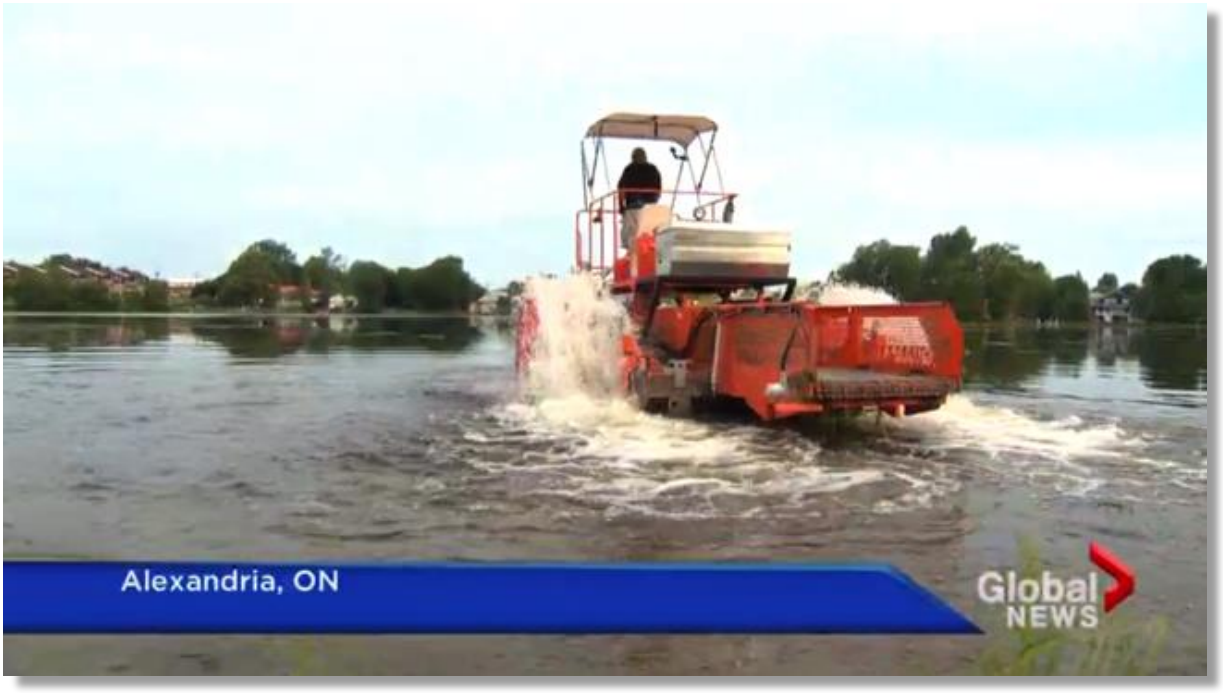
Eurasian Milfoil - Invasive Species

Simon and McCharles Lakes have both been identified as having Eurasian Milfoil present. Simon Lake joined the EnviroScience Weevil Program in 2011 to address this invasive species, but was dropped out of the project in 2012 due to excessive algae growth;[9] and Erik Oija has been advocating for the City to purchase a Harvester to cut Eurasian Milfoil in McCharles Lake since before this Council was elected.

VRS is concerned that the proposed harvester would spread Eurasian Milfoil downstream into the lower Vermilion River system.

SLCSG's Proposed Harvester

The SLCSG has applied for an HCI Grant to purchase a harvester to skim the algae from Mud, Simon and McCharles Lakes, such as the harvester manufactured by Aquamarine, and demonstrated here:



This harvester is driven by paddle wheels located outside of the cutter/skimmer sled. This is of particular concern because the skimmer could miss small pieces of milfoil torn or broken off and/or disturbed by these aggressive paddle wheels, and send fragments downstream to spread this highly invasive species.

Additionally, we were informed by the President of SLCSG that the manufacturer does not recommend operating this machine in waters less than 2 feet deep, in order to prevent sediments from being disturbed. It is well documented that soils and water bodies downstream of the old open roast yards contain heavy metal contaminated sediment; and these paddle wheels would risk stirring it up and sending it on downstream where many local residents rely on water drawn from the Vermilion River for their drinking water and daily household requirements.

Simon Lake – Sept. 09

It is typical to see the algae floating along the shorelines; however, this machine would not be able to work in close to the shorelines because of shallow water.

Vacuum and Boom Removal of Algae:

The City could explore a more economical and effective short-term solution, with a lower risk of contaminating downstream waters. For example, the use of an environmental boom, similar to

those used on algae farms or for oil spills, could be used to draw the floating algae in towards shoreline areas where it could then be sucked up by vacuum trucks, and hauled away to local regreening/reclamation/dump sites. Disposing of the algal biomass elsewhere and converting it into compost or fertilizer would be a sustainable solution, and would help to remove some nutrients from these lake systems.

The City already contracts vacuum trucks for sewer maintenance, and there are many different types of environmental booms that could be used to draw the algae safely into shore.

It is also good to keep in mind that removing the algae would open the shoreline areas to more light, which may make the environment more hospitable for Eurasian Milfoil to flourish.

Conclusion:

The mechanical harvester is a short-term Band-Aid solution, when the real source of the problem stems from insufficient stormwater and wastewater capacity. Long-term solutions are needed to address the extremes of climate change that are widely predicted to increase in a warming climate.

Removal of algae from the lakes in question will not adequately address their ongoing pollution and eutrophication - only stopping or minimizing the stream of nutrients entering into the lakes can make real and lasting change.

The City must address this unacceptable practice of bypassing treatment of sewage when heavy rain events occur, and make increasing the capacity of our stormwater and wastewater infrastructure a priority. It is imperative that strong efforts are made towards upgrades that will stop inflow and infiltration, provide stormwater retention reservoirs for later treatment, and ultimately to end bypass events. We must ensure key built and natural infrastructure is climate resilient, and protects our finite freshwater resources.

VRS requests that the above recommendations be given serious consideration, both in the HCI Grant Application, as well as in the 2017 Municipal Budgeting.

Sincerely,

Linda Heron
Chair, Vermilion River Stewardship

Cc: David Furino, Simon Lake Community Stewardship Group, David.Furino@sympatico.ca
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Endnotes:

[1] Flushing out the Truth: Sewage Dumping in Ontario, June 2009 (revised July 2009), by ecojustice.
[2] The Great Lakes Sewage Report Card [2013], by ecojustice.
[3] Eutrophication and Recovery in Experimental Lakes: Implications for Lake Management
D. W. Schindler. Science, New Series, Vol. 184, No. 4139. (May 24, 1974), pp. 897-899
[4] Hasler, A. D. 1947. Eutrophication of lakes by domestic drainage. Ecology 28:383–395.

[5] Smith, V. H., S. B. Joye, and R. W. Howarth. 2006. Eutrophication of freshwater and marine ecosystems. Limnology and Oceanography 51:351–355.
[6] Schindler, D. W. 2006. Recent advances in the understanding and management of eutrophication. Limnology and Oceanography 51:356–363.
[7] The Role of Iron in Suppressing Internal Phosphorus Loading and Toxic Cyanobacterial Blooms in Freshwater Lakes, by Diane Michelle Orihel.
[8] Eutrophication and Recovery in Experimental Lakes: Implications for Lake Management D. W. Schindler. Science, New Series, Vol. 184, No. 4139. (May 24, 1974), pp. 897-899.
[9] 2014 Milfoil Solution Report at the City of Greater Sudbury, Ontario. November 20, 2014, Project No. 1641-4958, by EnviroScience.