



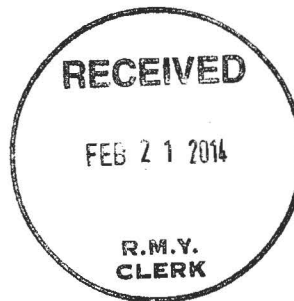
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→ M. Rabeau

Corporate Services Department
Legislative Services Division
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Email clerks@pickering.ca

February 14, 2014



Honourable Jim Bradley
Minister of Environment
77 Wellesley Street West, 11th Floor
Toronto, ON M7A 2T5

Subject: Town of Ajax Resolution
Re: Duffin Creek Water Pollution Control Plant
Outfall Environmental Assessment -
Part II Order Request
File: A-2400-001-13

The Council of the Corporation of the City of Pickering at a meeting held on February 13, 2014, endorsed the correspondence received from Nicole Wellsbury, Manager of Legislative Services/Deputy Clerk, Town of Ajax regarding the Duffin Creek Water Pollution Control Plant Outfall Environmental Assessment - Part II Order Request.

Should you require further information, please do not hesitate to contact the undersigned at 905.420.4660 extension 2019.

Yours truly

Debbie Shields
City Clerk
DS/lcr

Copy: Regional Clerk
Regional Municipality of Durham
605 Rossland Road East
Whitby, ON L1N 6A3

✓ Regional Clerk
Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario L3Y 6Z1

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Ajax, ON L1S 7H3

Corneliu Chisu, MP, Pickering-Scarborough East
300 Kingston Road, Unit 4
Pickering, ON L1V 6Z9

Joe Dickson, MPP, Ajax-Pickering
50 Commercial Avenue, Suite 201A
Ajax, ON L1S 2H5

The Honourable Tracy MacCharles, MPP, Pickering-Scarborough East
13-300 Kingston Road
Pickering, ON L1V 6Z9

Environmental Commissioner of Ontario
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The Great Lakes & St. Lawrence Cities Initiative
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Chicago, Illinois 60606

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Ajax, ON L1S 2H9

Patti L. Barrie, Clerk
Municipality of Clarington
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Bowmanville, ON L1C 3A6

Debi Wilcox, Clerk
Town of Whitby
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Conservation Ontario
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Newmarket, ON L3Y 4W3

Toronto and Region Conservation
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Downsview, ON M3N 1S4

Central Lake Ontario Conservation Authority
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Oshawa, ON L1H 3T3

Director, City Development



TOWN OF AJAX

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City of Pickering Clerk's Office
ATTN: Debbie Shields, City Clerk
dshields@pickering.ca

February 11, 2014

Re: Town of Ajax Resolution RE: Duffin Creek Water Pollution Control Plant Outfall Environmental Assessment – Part II Order Request

Please be advised that the following resolution was passed by Ajax Town Council at its Meeting held Monday February 10, 2014:

1. That the staff report entitled "Duffin Creek Water Pollution Control Plant Outfall Environmental Assessment-Part II Order Request" dated February 10, 2014, be endorsed;
2. That Council re-affirm its direction that a Part II Order Request incorporating the results of technical reviews conducted by the Town's experts be prepared by outside counsel in conjunction with staff and submitted to the Minister of the Environment, and to the Councils of Durham Region and York Region, by February 18, 2014;
3. That the Part II Order Request ask the Minister to direct the Regions to reimburse the Town for the cost of external legal counsel and consulting experts' field work and peer reviews to date, which demonstrate the fundamental deficiencies in the Outfall EA and the need for an Individual Environmental Assessment, together with such ongoing funding as may be necessary to secure the Town's participation in the Individual Environmental Assessment;
4. That this report and the Part II Order Request and expert reports be made available to the public by posting on the Town's website, following submission to the Minister; and,
5. That this report be sent to the Ontario Minister of the Environment, the Councils of Durham Region and York Region, the City of Pickering and other lakefront communities in Durham Region, the Stakeholder Advisory Committee, Pickering-Ajax Citizens Together--Protecting Our Water (PACT POW), Ajax Environmental Advisory Committee, the Environment Commissioner of Ontario, the Great Lakes and St. Lawrence Cities Initiative, the Regional Works Commissioners of Ontario, the Ontario Water Works Research Consortium, the Centre of Excellence for Great Lakes and Human Health, the Executive Committees and Source Protection Committees of the Toronto and Region Conservation Authority and the Central Lake Ontario Conservation Authority, Conservation Ontario, the Council of Canadians, EcoJustice, Lake Ontario Waterkeeper, Environmental Defense, Chris Alexander MP (Ajax-Pickering), Joe Dickson MPP (Ajax-Pickering), Tracey MacCharles MPP (Pickering-Scarborough East) and other interested parties.

A copy of the staff report that prompted this action is attached. If you require any additional information, please do not hesitate to contact the author of the staff report, Barb Hodgins, at 905-619-2529 ext 3247 or barb.hodgins@ajax.ca

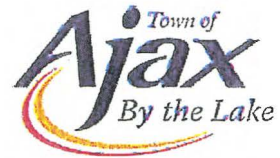
Sincerely,



Nicole Wellsbury
Manager of Legislative Services/Deputy Clerk

Copy: Leona Barrington, Government Relations Advisor, Town of Ajax
Barb Hodgins, Senior Policy Planner, Town of Ajax

**TOWN OF AJAX
REPORT**



REPORT TO: Council

SUBMITTED BY: Paul Allore, MCIP, RPP
Director of Planning and Development Services

PREPARED BY: Barbara Hodgins, MCIP, RPP
Senior Policy Planner

SUBJECT: Duffin Creek Water Pollution Control Plant Outfall Environmental Assessment – Part II Order Request

WARD(S): All

DATE OF MEETING: February 10, 2014

REFERENCE: Staff Reports: General Government Committee - May 5 & November 24, 2011; November 8, 2012; April 4 & May 23, 2013; Community Affairs & Planning Committee – June 18, 2012; Council – October 22, 2012 & April 8, 2013

Community Action Plan: Leader in Environmental Sustainability

RECOMMENDATIONS:

1. That the staff report entitled “Duffin Creek Water Pollution Control Plant Outfall Environmental Assessment-Part II Order Request” dated February 10, 2014, be endorsed;
2. That Council re-affirm its direction that a Part II Order Request incorporating the results of technical reviews conducted by the Town’s experts be prepared by outside counsel in conjunction with staff and submitted to the Minister of the Environment, and to the Councils of Durham Region and York Region, by February 18, 2014;
3. That the Part II Order Request ask the Minister to direct the Regions to reimburse the Town for the cost of external legal counsel and consulting experts’ field work and peer reviews to date, which demonstrate the fundamental deficiencies in the Outfall EA and the need for an Individual Environmental Assessment, together with such ongoing funding as may be necessary to secure the Town’s participation in the Individual Environmental Assessment;
4. That this report and the Part II Order Request and expert reports be made available to the public by posting on the Town’s website, following submission to the Minister; and,

-
5. That this report be sent to the Ontario Minister of the Environment, the Councils of Durham Region and York Region, the City of Pickering and other lakefront communities in Durham Region, the Stakeholder Advisory Committee, Pickering-Ajax Citizens Together–Protecting Our Water (PACT POW), Ajax Environmental Advisory Committee, the Environment Commissioner of Ontario, the Great Lakes and St. Lawrence Cities Initiative, the Regional Works Commissioners of Ontario, the Ontario Water Works Research Consortium, the Centre of Excellence for Great Lakes and Human Health, the Executive Committees and Source Protection Committees of the Toronto and Region Conservation Authority and the Central Lake Ontario Conservation Authority, Conservation Ontario, the Council of Canadians, EcoJustice, Lake Ontario Waterkeeper, Environmental Defense, Chris Alexander MP (Ajax-Pickering), Joe Dickson MPP (Ajax-Pickering), Tracey MacCharles MPP (Pickering-Scarborough East) and other interested parties.
-

BACKGROUND:

a) Overview

The Regions of Durham and York (the Regions) have published an Environmental Study Report (ESR) in relation to the outfall for the Duffin Creek Water Pollution Control Plant (WPCP), which is available for public comment until February 18, 2014. The ESR documents the findings of the Regions' Schedule C Municipal Class Environmental Assessment (Class EA) process,¹ and presents the Regions' preferred alternative for addressing the limitations of the existing outfall.

The outfall is a 1 km long pipe that extends from the WPCP into the nearshore of Lake Ontario, discharging sewage effluent into the lake through a series of 38 diffuser ports.² The Regions propose to install rubber "duck billed"³ valves on the end of these diffuser ports, which will discharge effluent with greater velocity, but do nothing to remove phosphorus from the effluent.

This report presents a summary of the key findings of a team of experts hired by the Town to investigate the causes and impacts of nuisance algae growth in the Ajax nearshore, and to undertake a peer review of key technical issues raised by the Regions' Outfall EA.

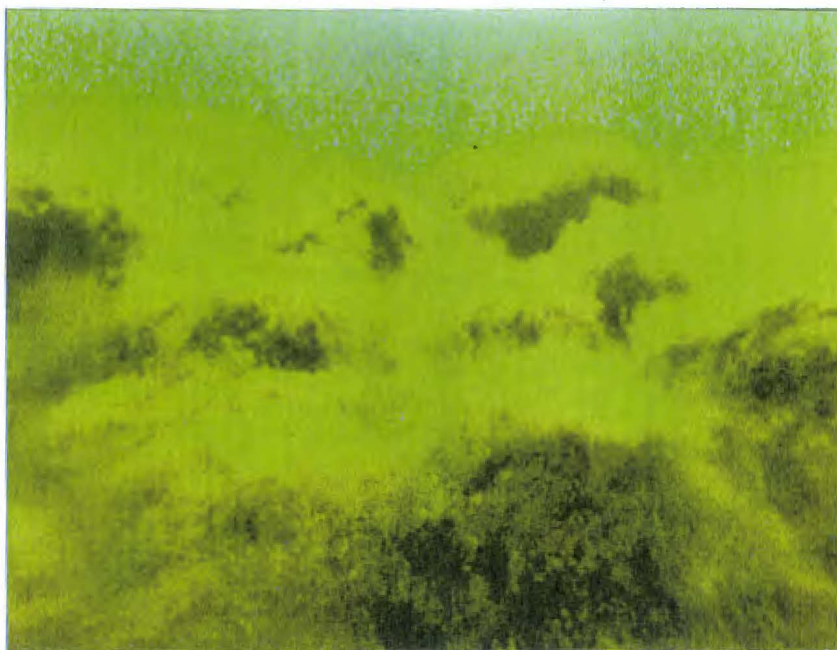
As set out in detail below, these experts have concluded that effluent discharged from the WPCP creates a plume of phosphorus-enriched water directly over top of prime algae habitat (a nearshore zone where there is sufficient light, the right water temperature and the right lake-bottom conditions to grow algae).

In short, phosphorus from the WPCP is over-fertilizing the nearshore water of Lake Ontario, causing a proliferation of nuisance algae to grow, and resulting in a series of unacceptable environmental impacts including interference with spawning by native fish species, and the potential destruction of fish habitat. During the summer, the algae breaks off from the lake bottom, drifts to shore, and rots. The algae itself washes in to shore in clumps, or gets blended up into a 'soup', which keeps children from playing and swimming in nearshore water.

¹ Schedule 'C' Municipal Class Environmental Assessment to Address Outfall Capacity Limitations at the Duffin Creek WPCP (Outfall EA).

² There are 63 diffuser ports in total on the existing outfall, only 38 of which are presently in use.

³ Or "variable port check valves".



The severe odour caused by rotting algae interferes with residents' reasonable enjoyment of their properties, forcing them indoors and behind closed windows during the hottest months of the summer. The "nauseating", "sewage-like" odour of rotting algae prevents Ajax families from enjoying the recreational trails, beaches and waterfront lands that Ajax has worked so hard to assemble and protect for public use.

These nuisance impacts are unacceptable and preventable. Cost-effective technology is available – and is in use at other similarly-sized sewage treatment plants today – to remove phosphorus (including up to 99% of the phosphorus that feeds algae growth - soluble reactive phosphorus or SRP). The Regions' preferred alternative, however, does not result in a decrease in phosphorus discharges by the WPCP to the Ajax nearshore. On the contrary, when the WPCP increases the current volume of effluent from 360 million litres per day (360 MLD) to 630 MLD, the Regions preferred alternative would allow phosphorus discharges to nearly triple, to 113 tonnes/year.

The Regions' Outfall EA is fundamentally deficient because it fails to acknowledge the role of the WPCP, which supplies approximately 97% of the SRP loading to the Ajax nearshore, in causing nuisance algae growth. As a result, the ESR fails to examine the environmental impacts of nuisance algae growth on fish, fish habitat, water quality and on the lives of Ajax residents. In turn, the ESR fails to identify and assess alternatives based on their ability to remove phosphorus from WPCP effluent and to mitigate existing adverse environmental effects caused by the growth of nuisance algae.

The Environmental Assessment (EA) process is intended to identify, mitigate or *prevent* adverse environmental impacts, and the Class EA process in particular is to be used for projects with minor, predictable environmental impacts that can be mitigated.

The Regions' preferred alternative will not result in minor environmental impacts but will exacerbate the already significant adverse environmental effects caused by SRP in WPCP effluent. The Regions must be required to implement an alternative that will mitigate or prevent the adverse environmental impacts presently caused by the SRP in the effluent, rather than an alternative that will make the impacts worse.

Based on the Town's experts' findings and conclusions, staff recommend that the Part II Order Request prepared at Council's direction, incorporating the results of the Town's expert and legal review, be submitted to the Minister of the Environment and to the Regions by February 18, 2014.

b) Duffin Creek Water Pollution Control Plant

The WPCP is located immediately adjacent to and west of the Town of Ajax, in the City of Pickering, at the Lake Ontario shore. It has been co-owned and operated by the Regions since 1997.

The WPCP is presently the second largest sewage treatment plant in Ontario. It has been operating for more than 30 years, and its capacity has been expanded twice, to an approved maximum of 630 million litres per day (MLD). Effluent flows presently average 360 MLD. The WPCP releases sewage effluent into the nearshore water of Lake Ontario, just 1 km from the Ajax waterfront.

Since at least 2005, the Town of Ajax has raised concerns with the Regions and the Ministry of the Environment (MOE) regarding the adverse environmental impacts of effluent from the WPCP.

c) Town's First Part II Order (Bump Up) Request

The most recent expansion in capacity from 420 to 630 MLD (Stage 3) was designed to treat increasing sewage flows from growing communities, primarily located in York Region, and the expanding York-Durham Sewage System (YDSS or "Big Pipe"). A Class EA process was undertaken for the Stage 3 expansion in 2004/2005.

Within the context of the Class EA process for the Stage 3 expansion, the Town expressed concerns to the Regions about nutrients in WPCP effluent exacerbating nuisance algae growth, and impairing nearshore water quality. The Town did not feel that the impact of the then-current WPCP effluent discharge, or the proposed increase to 630 MLD, had been adequately studied, or that appropriate controls were in place to prevent a further deterioration of water quality.

The Town participated in the Class EA process, and communicated its concerns to the Regions repeatedly, through staff reports, letters and in-person meetings with Region staff and consultants. Unfortunately, the Town's concerns were not addressed in the Regions' ESR.

Accordingly, in 2006 the Town retained a team of peer review experts and external legal counsel, David Estrin, Senior Environmental Law Specialist from Gowling Lafleur Henderson LLP. Mr. Estrin conveyed the results of the Town's peer review to the Regions and to the Minister of the Environment, and requested that the Class EA be "bumped up" to an Individual Environmental Assessment, with the goal of avoiding further deterioration of nearshore water quality⁴.

In response to the concern expressed by the Town and other stakeholders, the Minister of the Environment imposed a series of conditions on the Stage 3 expansion.⁵ The Regions were required to monitor odour from the WPCP, and prohibited from operating the WPCP at flows above 520 MLD until a solution for the limitations of the outfall had been identified and implemented.

⁴ http://www.ajax.ca/en/doingbusinessinajax/resources/pdeng_d_revisedpartiiorrequest.pdf

⁵ <http://www.ajax.ca/en/doingbusinessinajax/resources/DuffinCreekWPCP-MOEDecision-Regions032107.pdf>

It is this condition that led the Regions to commence the Outfall EA in December 2010.

d) Independent Peer Review By Dr. Auer

In 2010, just before the Outfall EA commenced, the Regions, the Town and Ontario Power Generation jointly funded an independent peer review report of available local water quality studies and data by Dr. Martin Auer of Michigan Technological University.

Dr. Auer's draft peer review report was circulated in the fall, of 2010 and in final form in July 2011. Dr. Auer concluded that the WPCP is overwhelmingly the largest source of SRP and total phosphorus (TP) to the Ajax nearshore and is therefore the appropriate management focus with respect to nuisance algae growth. Yet Dr. Auer's findings have not informed the Regions' ESR or the Outfall EA, which ignores the role of the WPCP in causing nuisance algae growth in the Ajax nearshore.

DISCUSSION:

a) Outfall EA

The Regions published the Notice of Completion for the Outfall EA on November 19, 2013, and released the ESR for public comment until February 18, 2014.⁶ The Town has participated actively throughout the Outfall EA, as a member of the Stakeholder Advisory Committee (SAC) and by directly communicating its concerns to the Regions.

To date, neither the Town's concerns, nor Dr. Auer's 2011 findings, have been appropriately addressed. As a result, for a second time, the Town was required to retain a team of experts and external legal counsel to identify fundamental gaps in the Regions' ESR, and to examine cost-effective and commercially available solutions to remove phosphorus (including SRP) from WPCP effluent and improve water quality in the Ajax nearshore. As in 2006, the Town retained David Estrin, Senior Environmental Law Specialist from Gowling Lafleur Henderson LLP.

The Town's team of experts includes:

- Dr. Martin T. Auer, Professor of Civil and Environmental Engineering at Michigan Technological University, specializing in surface water quality engineering and the study of algae, with assistance from the Upstate Freshwater Institute in Syracuse, New York;
- Dr. Karl Schiefer, Senior Consultant and Aquatic Toxicologist, specializing in the assessment of impacts to fish and fish habitat; with assistance from Carri-Lyn Epp, Fisheries Ecologist with EcoMetrix,
- Dr. Tony van der Vooren, P.Eng., Senior Environmental Consultant with AMEC Americas Limited, specializing in air quality and odour monitoring and evaluation;
- Dr. Bill Oldham, P.Eng.(BC), President of Oldham Environmental Engineering Ltd., and Professor Emeritus in the Department of Civil Engineering at the University of British Columbia, specialist in wastewater management, water treatment and water quality studies; and
- Al Shpyth, Senior Environmental Specialist with Ecometrix, specializing in environmental policy and economics.

⁶ The ESR is available at the Town Hall, Main Public Library and www.durham.ca/outfall/ea.

The field studies and peer review conclusions of the Town's experts are summarized below.

b) Summary Of Field Work And Peer Review Team Findings

i) *Field Studies of Phosphorus and Cladophora in Lake Ontario along the Ajax, Ontario Waterfront, and Environmental Study Report Review, by Dr. Martin T. Auer submitted to the Town of Ajax, January 23, 2014:*

Given his extensive knowledge gained through decades of scientific, peer-reviewed research about attached algae in the Great Lakes, with particular attention to *Cladophora*, Dr. Auer was asked to assess whether the phosphorus discharged to the Ajax nearshore from the WPCP is causing or contributing to the nuisance algae problem occurring along the Ajax waterfront. His assessment is as follows.

Cladophora requires four conditions to grow: the right water temperature, sufficient light, suitable substrate, and a source of food (specifically SRP). In Lake Ontario, optimal water temperatures generally occur from late-May through mid-June. During the summer of 2013, field work was completed to examine the availability of light, substrate and phosphorus within the Ajax nearshore.

Sonar surveys of the lake bottom and measurements of the underwater light field, indicate that there is an approximately 1 kilometre wide band stretching along the Ajax nearshore where sufficient light and substrate exist to support *Cladophora* growth (the "*Cladophora* Habitat Zone"). Underwater video surveys of the Ajax nearshore confirmed the extensive presence of *Cladophora*, often covering 100% of the lake bottom, throughout the *Cladophora* Habitat Zone.

The existence of habitat alone, however, will not create a nuisance algae problem. Algae can be present without causing nuisance conditions. The difference between areas that merely have algae present, and areas experiencing nuisance conditions, is how much plant material is produced during the growing season (or how "productive" the system is).

How much plant material grows in a given area is controlled by how much SRP is made available to the algae.

To characterize how much SRP is being made available to the algae within the *Cladophora* Habitat Zone, the effluent plume from the Outfall was investigated and sampled on two occasions. The highest SRP concentrations were found immediately adjacent to the Outfall. Dramatically elevated levels of SRP were observed throughout the *Cladophora* Habitat Zone, including levels high enough to achieve maximum *Cladophora* growth rates.

Currents within the Ajax nearshore have the potential to spread this SRP-enriched plume to the east and west of the Outfall, across the *Cladophora* Habitat Zone. Refer to Figure 1.

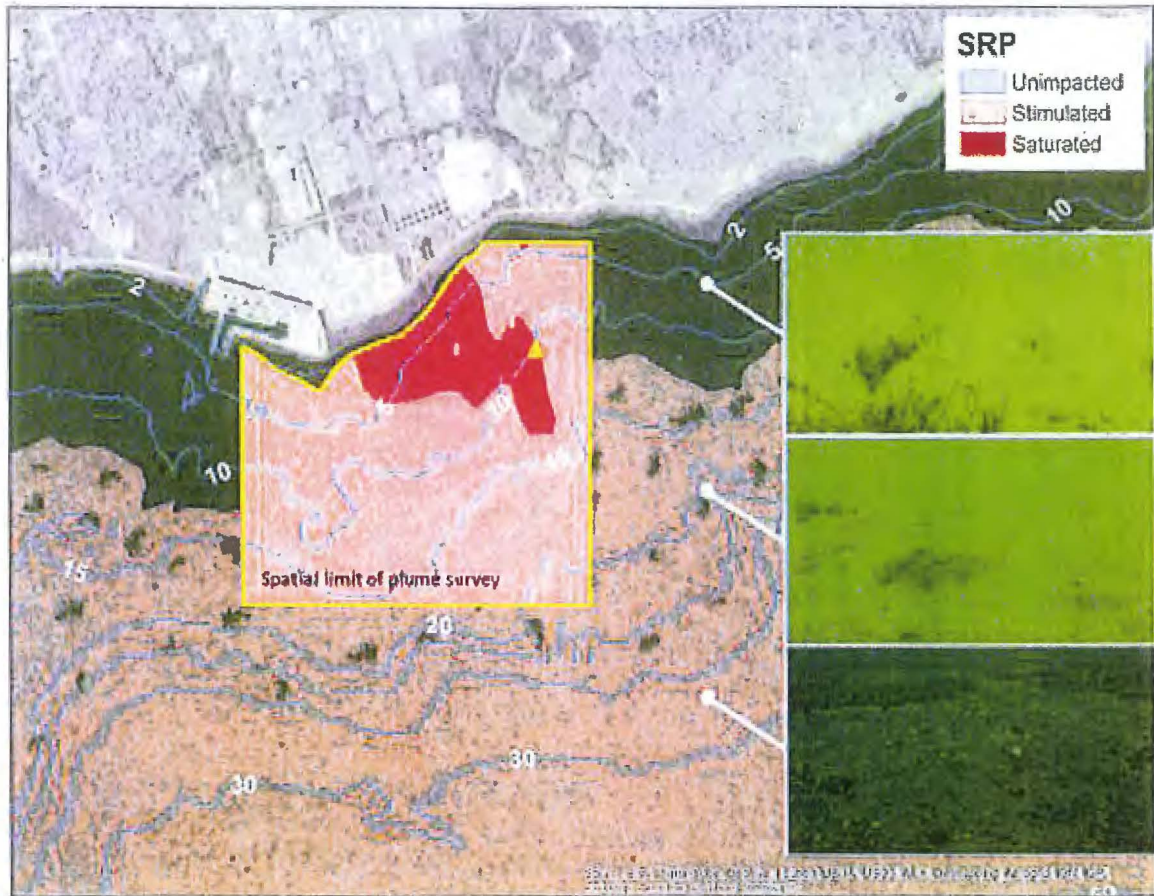


Figure 1: The position of the Duffin Creek WPCP effluent plume (red and pink) on 8/9/2013 overlain on the Cladophora Habitat Zone (green) at Ajax, Ontario. The yellow triangle points to the location of the Duffin Creek WPCP outfall.

In order to confirm that it is the SRP from the Outfall that is stimulating overproduction of algae in the Ajax nearshore, samples of algae tissue were taken at various locations across the nearshore and analyzed for phosphorus content. The highest tissue phosphorus concentrations were observed in the immediate vicinity of the Outfall, with levels decreasing with distance away from the Outfall.

In other words, the very highest growth rates of algae were found closest to the Outfall, with decreasing rates of growth found at increasing distance away from the Outfall.

Based on the results of these field investigations and analysis, Dr. Auer has concluded that there is no doubt that the SRP in the effluent being discharged to Lake Ontario from the WPCP is the primary contributor to nuisance conditions of *Cladophora* growth at Ajax.

The WPCP is slated to substantially increase the amount of phosphorus (including SRP) that it discharges to Lake Ontario. The impact of this increase, absent a reduction in effluent phosphorus concentrations and/or relocation of the outfall, will be greater stimulation of *Cladophora* growth and exacerbation of the nuisance algae problem (increased amounts of algae over a larger area).

ii) Review–Class Environmental Assessment to Address Outfall Capacity Limitations at the Duffin Creek Water Pollution Control Plant, by Dr. Martin T. Auer submitted to the Town of Ajax, January 23, 2014:

In addition to the field investigation of the Ajax nearshore discussed above, Dr. Auer was also asked to review Chapter 5 of the Regions' ESR which addresses nuisance growth of algae in the Ajax nearshore. Dr. Auer was specifically asked to determine if the high concentrations of phosphorus observed along the Ajax waterfront associated with the discharge from the WPCP were acknowledged in the ESR to be a cause of the nuisance growth of *Cladophora* and related water quality degradation and odour impacts being experienced by Ajax residents.

In Dr. Auer's opinion, the ESR fails to acknowledge that the WPCP plays a significant role in stimulating nuisance growth of *Cladophora*. Rather, the ESR asserts that the primary drivers of such nuisance growth are rising water temperatures associated with a global climate change and the ecosystem engineering activities of invasive mussels.

Having reviewed the reasoning provided for these assertions, Dr. Auer has concluded that:

- 1) There is no basis in the scientific literature to assert, let alone conclude, that rising lake temperatures are a primary cause of nuisance *Cladophora* growth in Lake Ontario; and
- 2) Based on studies by other scientists as well as Dr. Auer's own studies and field work, invasive mussels (which transform phosphorus into a form useable by algae) could not cause the nuisance algae conditions found along the Ajax shoreline in the absence of the very large quantities of phosphorus being discharged in the WPCP effluent.

Furthermore, Dr. Auer is of the view that the ESR inappropriately focuses on peripheral issues, to the exclusion of the WPCP, which supplies 97% of the SRP delivered during the months when *Cladophora* grows and which delivers that load directly over prime habitat for colonization by attached algae.

Dr. Auer also found that the ESR leaves the reader with the sense that reducing phosphorous discharges would require technologies and supporting science beyond that presently available. Dr. Auer indicates that this is far from the truth, as the required treatment technologies are now widely applied across Canada and the US.

In addition to these primary deficiencies, Dr. Auer has identified a host of further incorrect or misleading statements within the ESR relating to the causes of nuisance algae growth in Lake Ontario and the options that should have been identified as readily available to address this problem.

iii) Odour and Shoreline Algae Report, prepared by AMEC Americas Limited, January 13, 2014, with an appended August 2013 Odour Study:

In August 2013, given his decades of experience assessing and mitigating odour sources, plus his ongoing review of the Regions' odour modeling and monitoring work for the expanded WPCP on the Town's behalf, AMEC was retained to conduct ambient odour sampling at various locations along the Ajax waterfront in response to numerous complaints received from residents throughout the Summer of 2013 about offensive, sewage-like odours.

Dr. Tony van der Vooren, P. Eng., Manager, Air Quality analyzed the results of this sampling, which indicate that the strong “sewage-like” odours measured along the Ajax shoreline were 30 to 60 odour units (1 odour unit being where 50% of average persons would detect the odour). In Dr. van der Vooren’s opinion, such levels could:

- Lead to odour complaints;
- Prevent the use of Ajax’s beaches and shorelines for extended recreational uses;
- Inhibit the use of Ajax’s beaches and shorelines for transitory activities such as walking, rollerblading and cycling; and,
- Impact the enjoyment of nearby residents when using outdoor portions of their property and cause them to keep windows closed and stay inside.

AMEC’s testing further confirmed that these sewage-like odours were emanating from the lakeshore/lake, and not the WPCP facility. These odours were consistent with the descriptions provided by Ajax residents logging public complaints.

In addition to the above-noted testing, Dr. van der Vooren also reviewed the ESR and concluded that:

1. The Regions have not completed any studies in respect of algae-related odour impacts, despite their acknowledgment that algae is a major contributor to shoreline odour;
2. The ESR fails to assess any causal connection between phosphorus discharges from the WPCP (including SRP) and the nuisance growth of algae; and,
3. The ESR provides no evaluation of wastewater treatment technologies that could reduce phosphorus in discharged effluent for the purpose of mitigating algae growth and decay in the Ajax nearshore and thus reduce the odour impact from decaying algae along the Ajax shoreline.

iv) *Literature Review and Field Investigations of Round Whitefish Habitat Along the North Shore of Lake Ontario, prepared for the Town of Ajax by EcoMetrix Incorporated, January 16, 2014:*

EcoMetrix Incorporated was retained in 2013 by the Town to assess the potential for *Cladophora* to be adversely impacting habitat for Round Whitefish in the vicinity of the WPCP’s existing outfall and the Ajax waterfront. Round Whitefish is an important and useful indicator species for fish community health in the Ajax nearshore area. EcoMetrix was also asked to review the ESR for the Outfall EA.

EcoMetrix undertook a literature review, which included reviewing draft and final Outfall EA reports prepared for the Regions and numerous reports available in relation to the Pickering Nuclear Generating Station (NGS) and the Darlington NGS. In EAs conducted for the Pickering and Darlington NGSs (the Pickering NGS study area included the Ajax waterfront), Round Whitefish was identified as a Valued Ecosystem Component because they are a benthic (bottom-dwelling) native coldwater species that relies on the nearshore area to feed and spawn.

Also, EcoMetrix experts conducted fieldwork in Lake Ontario within the WPCP's existing outfall area and across the Ajax nearshore area, and at a reference area in Georgian Bay.

The results of Ecometrix's literature review, field studies, and ESR review indicate that:

1. Round Whitefish typically spawn over coarse substrates in early December in nearshore areas along the north shore of western/central Lake Ontario. Rocky substrates of the nearshore areas along the north central shore of Lake Ontario, including the Ajax nearshore and the Outfall EA study area, have been documented to be spawning/nursery areas for Round Whitefish, and as such, the condition of this habitat is likely key to this species;
2. A comparison of substrate information collected in 2013 to historical information for the area east of the Pickering NGS showed a significant change in substrate type. In 1981, the substrates east of the Pickering NGS were predominantly comprised of bedrock, with boulders and some cobble over top. In 2013, little to no visible hard substrate was observed. Instead, *Cladophora* algal mats covered essentially all hard substrates west and east of the existing outfall;

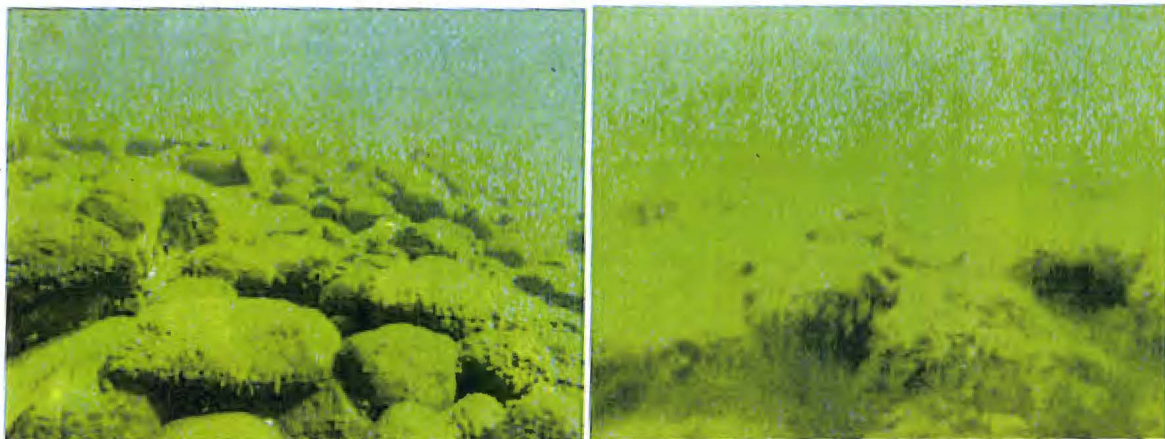


Figure 2: Round Whitefish Spawning Substrate at 5 metres depth in Lake Huron (Left) and Ajax nearshore (Right)

3. The potential effects of this heavy *Cladophora* growth on Round Whitefish spawning habitat include avoidance of the habitat, increased egg exposure and predation, and increased mortality of over-wintering eggs. *Cladophora*-related changes to the nearshore habitat observed in 2013 indicate that the spawning habitat of Round Whitefish may have already become permanently altered such that the ability of whitefish to use this area to carry out one or more of their life processes has been diminished; and,
4. None of the Outfall EA documents or the ESR address the potential for significant adverse effects on Round Whitefish spawning habitat. In addition, the reports did not contain current information on Round Whitefish habitat, current use of the habitat by Round Whitefish, or any data on the reproductive success of Round Whitefish within the study area. As the WPCP is a contributor of nutrients to the nearshore of Lake Ontario including the Ajax waterfront, and the effects of excessive nutrients promote excessive algae growth, the effects of *Cladophora* on Round Whitefish habitat must be considered as part of the Outfall EA.

v) *Removal of Soluble Reactive Phosphorus from Sewage Effluent at Duffin Creek WPCP, prepared by Oldham Environmental Engineering Ltd., January 2014:*

Dr. Bill Oldham, P.Eng.(BC) of Oldham Environmental Engineering Ltd. was retained by the Town in 2013 and was asked to consider:

- What technologies are commercially available to remove phosphorus and, in particular SRP, from WPCP effluent?
- What concentration of SRP is achievable using these technologies and what would be the approximate cost of employing these technologies at the WPCP?
- How does this cost compare to the cost of the alternatives evaluated as part of the Outfall EA and if SRP removal had been considered as one of the criteria for evaluation within the Outfall EA, how would the existing alternatives rank in relation thereto?

Based on Dr. Oldham's decades of experience, a tour of the WPCP and a review of data obtained from the WPCP plant staff, Dr. Oldham concluded as follows:

1. The WPCP is a conventional secondary treatment plant that incorporates chemical phosphorus removal. Based on the first 6 months of 2013, plant effluent contained approximately 0.3 mg/L of total phosphorus (TP), and about 0.2 mg/L of SRP on average. These average concentrations equate to estimated loadings of 110 kilograms per day (kg/d) of TP and 72 kg/d of SRP at the current average effluent flow of 360 MLD;
2. There are multiple commercially proven phosphorus removal technologies that are capable of achieving dramatically better effluent quality than that which is currently being achieved at the WPCP. The addition of ballasted flocculation (one form of which is known as "Actiflo") to the WPCP processes could potentially reduce TP and SRP concentrations in plant effluent to as low as 0.008 mg/L and 0.003 mg/L, respectively. This would constitute an elimination of approximately 97% of TP mass and 99% of SRP mass that would otherwise be discharged to the Ajax nearshore when the WPCP fully utilizes its 630 MLD capacity;
3. Implementing Actiflo at the WPCP is cost effective in comparison to the other solutions considered by the Regions. The estimated lifecycle cost of using Actiflo at the WPCP is approximately \$118 million. For comparison, the Regions' estimated lifecycle cost of membrane filtration in the ESR is more than twice as much (\$243 million), and the construction of a new, longer outfall was almost twice as much at \$229 million;
4. Assuming that SRP is a more useful effluent parameter than TP in achieving improved Ajax nearshore water quality, ballasted flocculation should have been considered as a treatment option in the ESR. As the estimated lifecycle cost of implementing ballasted flocculation is far less than many of the other alternatives considered in the ESR, it is apparent that the ESR did not fairly or fully evaluate the potential benefits of this treatment technology; and,
5. The Regions' current preferred ESR alternative, the duck-billed discharge orifices, will not reduce TP or SRP lake loadings at all. In fact, the net result of the Regions' preferred alternative will be an increase of TP entering the Ajax nearshore environment of some 30 tonnes per year by the time effluent flows reach 630 MLD.

FINANCIAL IMPLICATIONS:

Early in the Outfall EA process, the Town spent approximately \$65,000 for preliminary consulting expertise, particularly reviewing the Regions' lake water modelling.

In April 2013, Council endorsed a phased strategy for the remainder of the Outfall EA, with supportive funding (which was revised in June and October 2013) to hire external legal counsel and expert consultants to undertake fieldwork and review the ESR.

Based on invoices received at this time, approximately \$594,000 of the \$798,000 funding amount approved by Council for the first and second phase work has been invoiced, leaving approximately 25% (\$204,000) to pay for any outstanding invoices and to complete the remaining second phase work, which include: the submission of a Part II Order Request; and follow-up meetings with the Regions and the MOE, if required.

To recover these costs, staff recommend that the Part II Order Request ask the Minister to direct the Regions to reimburse the Town for the cost of external legal counsel and consulting experts' field work and peer reviews to date, which demonstrate the fundamental deficiencies in the Outfall EA and the need for an Individual Environmental Assessment, together with such ongoing funding as may be necessary to secure the Town's participation in the Individual EA.

COMMUNICATION ISSUES:

Under the Ontario *Environmental Assessment Act*, any persons and parties with unresolved concerns regarding the preferred solution selected through the Regions' Outfall EA may submit Part II Order Requests, in writing, directly to the Minister of the Environment (minister.moe@ontario.ca) until the close of business on February 18th, 2014.

Part II Order Requests or comments should be copied to the Regions, as proponents, at the Regional Municipality of Durham, 605 Rossland Road East, Whitby ON L1N 6A3, Regional Municipality of York, 17250 Yonge Street, Newmarket ON L3Y 6Z1 and may be copied to the Town of Ajax, 65 Harwood Avenue South, Ajax ON L1S 2H9.

CONCLUSIONS

Notwithstanding the previous peer review, the concerns that have been raised by stakeholders and by the Town since at least 2005, and the work done by Dr. Auer for the Regions, the Town and the TRCA in 2011, the Regions' ESR refuses to acknowledge any causal connection between phosphorus in the WPCP's effluent (including SRP), and the proliferation of nuisance algae in the Ajax nearshore. As a result, the ESR fails to study the environmental, social and economic impacts of nuisance algae, and fails to identify and evaluate alternatives based on their ability to remove phosphorus, including SRP, from WPCP effluent. On the contrary, the Regions' preferred alternative will allow phosphorus discharges to nearly triple – to 113 tonnes per year. This is unacceptable.

The Town's experts carried out an extensive fieldwork program in 2013 and have demonstrated that phosphorus from the WPCP, and in particular SRP, is causing the proliferation of nuisance algae in the Ajax nearshore. The Regions must be required to remove phosphorus from WPCP effluent, in particular SRP, and to mitigate or prevent the adverse impacts caused by nuisance algae fed by WPCP effluent.

The Town's field studies and peer review demonstrate that the Regions' Class EA unreasonably ignored and refused to scientifically investigate the connection between then nuisance conditions along the Ajax nearshore and excessive SRP discharges from the WPCP. The Regions' Class EA is fundamentally deficient and fails to comply with the *Environmental Assessment Act*. The Regions must be required to:

- comprehensively examine the environmental, social and economic effects of nuisance algae caused by phosphorus in WPCP effluent, and in particular SRP, through an Individual EA;
- undertake a meaningful study of technologies that can remove phosphorus from effluent, in particular SRP, cost-effectively and within the existing footprint of the WPCP, such as Actiflo (or "ballasted flocculation"); and,
- the preferred alternative must, at a minimum, mitigate or prevent the adverse impacts caused by the phosphorus, in particular SRP, presently discharged in WPCP effluent.

Staff recommend that Council re-affirm its direction that a Part II Order Request incorporating the results of technical reviews conducted by the Town's experts as summarized above be prepared by outside counsel in conjunction with staff and submitted to the Minister of the Environment, and to the Councils of Durham Region and York Region by February 18, 2014.

Also, staff recommend that the Part II Order Request and expert reports be made available to the public by posting on the Town's website, following submission to the Minister of the Environment.

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