



**DUFFIN CREEK WPCP ADVISORY COMMITTEE MEETING #2
WEDNESDAY, SEPTEMBER 23, 2020 (3:00PM TO 5:00PM)
VIRTUAL MEETING VIA MICROSOFT TEAM**

MINUTES

IN ATTENDANCE – ADVISORY COMMITTEE MEMBERS

Mike Rabeau, Regional Municipality of York
John Presta, Regional Municipality of Durham
Victoria White, City of Oshawa
Krista Chomicki, Toronto Region Conservation Authority (TRCA)
Susan Clearwater, Durham Environmental Advisory Committee – (by phone)
Matthew Gaskell, Town of Whitby
Mike Molinari, Town of East Gwillimbury
Michael Sawchuck, Town of Ajax
Doris Ho, City of Pickering – (by phone)
Barry Laverick, Town of Whitchurch-Stouffville
Joanne Dies, Pickering Ajax Citizens Together Protecting Our Waterfront (PACPOW)
Eddy Wu, City of Markham
Jenn Moulton, Ministry of the Environment, Conservation, and Parks
Demetra Koros, Ministry of the Environment, Conservation, and Parks

REGRETS

Jaime Acosta, City of Vaughan
Carolyn Ali, Township of King

GUESTS

Adrienne Willoughby, Jacobs
Ansel Bather, Jacobs
Ray Cantwell, Jacobs
Mukund Padhye, Regional Municipality of York
Soyuz Mitra, Regional Municipality of York
Tavis Nimmo, Regional Municipality of Durham
Roger Inacio, Regional Municipality of Durham

FACILITATOR, Anneliese Grieve, Strategic Environmental Planning Solutions

RECORDING SECRETARY, Elaine Bell, Durham Region

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	<p>Meeting commenced at 3:05 p.m.</p> <p>Meeting facilitated by Anneliese Grieve</p>	
<p>A. Grieve</p>	<p>ITEM #1</p> <p>INTRODUCTIONS</p> <p>The Facilitator Anneliese Grieve opened the meeting by thanking everyone for attending the second Duffin Creek WPCP Advisory Committee meeting which is being held virtually. Everyone was informed of the meeting protocol for participating in a virtual meeting and advised that the meeting is being recorded and live streamed.</p> <p><u>PREVIOUS MEETING SUMMARY - JANUARY 28, 2020</u></p> <p>1. Minutes Comments and questions from the January 28, 2020 meeting have been incorporated and the Minutes have been posted on the project website www.durham.ca/outfallea</p> <p>2. Terms of Reference – Duffin Creek WPCP Advisory Committee Comments were addressed, and the Terms of Reference have been posted on the project website www.durham.ca/outfallea</p> <p>3. Action Items - Item #2 Comments about the meeting schedule remains outstanding and will be addressed at the end of today’s meeting.</p> <p>There being no further comments or additions to the Agenda of the Wednesday September 23, 2020 Duffin Creek WPCP Advisory Committee meeting, the Agenda was adopted as presented.</p>	
	<p>ITEM #2</p> <p>PRESENTATION AND DISCUSSION OF PROJECT STATUS UPDATE</p> <p>On behalf of York and Durham Regions, Adrienne Willoughby, Jacobs provided highlights of the PowerPoint presentation titled “Duffin Creek Water Pollution Control Plant Advisory Committee Meeting No.2” dated September 23, 2020. Refer to Attachment 2 to view the complete presentation titled <u>Phosphorus Reduction Action Plan and Outfall Diffuser Upgrades</u>. The presentation will also be available for viewing on the project website www.durham.ca/outfallea</p> <p>Highlights of the Phosphorus Reduction Action Plan and Outfall Diffuser Upgrades was summarized as follows by A. Willoughby</p>	

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A. Willoughby	<ul style="list-style-type: none"> • Durham and York Regions are implementing the recommendations from the Outfall Class Environmental Assessment and the Phosphorus Reduction Action Study (PRAP) which includes capital upgrades to the Plant. • The 3 optimization upgrades at the Plant include <ol style="list-style-type: none"> 1. Optimizing the ferric chloride dose points 2. Adding polymer to primary clarifiers 3. Installation of density current baffles in the secondary clarifiers • The existing configuration of the Outfall has 63 diffusers, 38 of the 63 diffuser ports are open and the rest are capped. The upgrades involve replacing the reducer nozzles with variable diffuser ports. The proposed variable diffusers are check valves which can operate under low flows with a smaller opening so the flow going through it has a higher velocity to achieve better mixing at low flow conditions. At high flow conditions, the check valve opens wider to allow the flow to pass through the diffuser port while maintaining appropriate velocity to achieve good mixing in the effluent mixing zone. New check valves will be installed in all 63 ports. The valves will be installed at a 10-degree angle above the lake bottom, so the lake bottom isn't disturbed at high flows. 	
S. Clearwater	<p>Asked if 80 is the number of future diffusers when the flow is increased? A. Willoughby responded that there are 63 diffuser ports in total which are in place today. There is no need to add more diffusers ports to the outfall.</p>	
A. Willoughby	<ul style="list-style-type: none"> • Explained the main treatment processes at Duffin Creek WPCP and the recommended upgrades from the PRAP study. The Plant currently applies ferric chloride for chemical phosphorus removal in the preliminary treatment stage and in secondary treatment. Polymer is applied upstream of the secondary clarifiers to enhance the solids removal. Several upgrades were identified during the PRAP study and are now being implemented to improve total phosphorus removal at the Plant. There are three capital upgrades. The first upgrade is related to the ferric chloride dose points. The second upgrade is adding polymer to the primary clarifiers. The third upgrade is density current baffles in the secondary clarifiers. 	
A. Willoughby	<ol style="list-style-type: none"> 1. Ferric Chlorides Dose Points Upgrades <ul style="list-style-type: none"> ○ The purpose of ferric chloride is to precipitate soluble reactive phosphorus in the wastewater. ○ The field study identified minor adjustments to the dose points for ferric chloride to improve mixing conditions and allow the Plant to have more operational flexibility on where staff apply ferric 	

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A. Willoughby	<p>chloride and other chemicals for the same objective in the treatment process.</p> <p>2. Primary Polymer addition</p> <ul style="list-style-type: none"> ○ During the field study a trial on testing the benefit of also adding polymer to the primary clarifiers was conducted. The result showed a performance benefit when peak flows are experienced at the Plant. This upgrade can maintain good performance across primary treatment with the addition of polymer and when implemented in full scale across the Plant. 	
A. Willoughby	<p>3. Secondary Clarifier Density Current Baffles</p> <ul style="list-style-type: none"> ○ The Density Current Baffle is a plate that is installed at a 30-degree angle below the effluent weir within the secondary clarifiers. It prevents solids from overflowing into the effluent channel. This upgrade provides an added performance enhancer to the secondary clarifiers that is beneficial during peak flow events. ○ Currently the Plant has two round secondary clarifiers that are fitted with the baffles. They were originally installed in the 90's but not in all tanks. ○ A stress test was conducted on the clarifiers during the field study by pushing high flows through two of the tanks (one with baffles, one without) and performance was measured. The result showed a slight improvement in effluent from the clarifier that did have the baffle installed. The recommendation from that test was to put the density current baffles in all tanks. 	
A. Willoughby	<p>Construction Planning</p> <ul style="list-style-type: none"> ● The upgrades will be completed under two separate construction contracts. The Outfall Diffuser upgrade needs to be done by a specialty dive contractor. The PRAP upgrades are on land and will be completed by a general construction contractor. ● The Outfall construction upgrades are planned to be completed during the summer of 2022. ● PRAP construction upgrades will require taking a few trains offline at a time while working through the upgrades. ● The overall treatment capacity of Duffin Creek WPCP will be temporarily reduced during construction while the tanks are offline to construct the upgrades. Proper planning will mitigate any potential impact of reduced performance during construction. 	
A. Willoughby	<p>Project Schedule and Status</p> <ul style="list-style-type: none"> ● Preliminary design for the upgrades has been conducted which documented the key design decisions. 	

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	<ul style="list-style-type: none"> • Detailed design was started early September which includes engineering drawings that will be given to the contractor for the upgrades along with certain specifications for equipment and piping. • Pre-consultation with regulatory agencies for permits and approvals for the work will commence over the next few months. • Detailed design will take another 6 months to complete and when the construction design package is ready, it will be put out for tendering with contractors to bid on and awarded by the Regions. Construction will then commence. • The Outfall upgrades will be done in the timeframe that it takes the PRAP upgrades to be completed. • The projects will take 4½ years to complete and are on track to be complete within the 5-year schedule that was required by the MECP as per their notice to the Regions November 2019. 	
J. Dies	<p>What approvals do you have to go through for the process to get everything in order? A. Willoughby responded that an update is required for the Environmental Compliance Approvals (ECA) with the Ministry of the Environment, Conservation and Parks. A package will be submitted to the Ministry that contains the pre-design report and engineering drawings, which will be incorporated into an ECA amendment. The ECA is a document that summarizes the existing treatment works at the Plant including effluent requirements and requirements for performance monitoring. For the Outfall Diffuser upgrades there are a few approvals needed to conduct the work in the water which requires approval from the Department of Fisheries and Oceans Canada and Transport Canada. The consultation for the approvals has commenced and will be in place before construction starts. Jacobs is reviewing if approvals are needed for the site modification through the City of Pickering.</p>	
J. Dies	<p>What if there is a major weather event with a lot of rainfall, is there a plan in place for when the tanks are off line? A. Willoughby responded that only a certain number of tanks are taken off line at a time. During the 18 months of the field study one-third of the Plant was off line to test performance of the other trains online at conditions representative of future flows and loads. There are measures in place to make sure if a peak flow event happens when certain trains are off line, staff will balance the flow through the remaining Plant along with operational changes to make sure the performance is sustained.</p>	
S. Clearwater	<p>Regarding storm maintenance, are all these tanks and trains exposed to the environment or are they inside a building? A. Willoughby responded that most of the tanks are open to the atmosphere. Some of the tanks and treatment process in the preliminary treatment process at the head of the Plant are covered or within a building but the rest are uncovered and outside.</p>	

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S. Clearwater	If you keep so many tanks off line are you covered for any extreme event for overflow or could the water get past the baffles during an extreme event? A. Willoughby responded that Duffin Creek WPCP has sufficient hydraulic capacity to convey the flows without over topping the tanks or spilling them, so no treatment processes need to be bypassed during a weather event.	
S. Clearwater	Is it because you are keeping some tanks off line to solve that problem? A. Willoughby noted the tanks and the channels that convey the flow and the distance between the tanks are appropriately sized to accommodate peak flow events.	
A. Willoughby	<p>ITEM #3</p> <p>PRESENTATION AND DISCUSSION OF PLANT PERFORMANCE INFORMATION</p> <p>On behalf of York and Durham Regions, Adrienne Willoughby, Jacobs provided highlights of the PowerPoint presentation titled <i>“Duffin Creek Water Pollution Control Plant Advisory Committee Meeting No.2” dated September 23, 2020.</i> Refer to Attachment 3 to view the complete presentation titled <i>Plant Performance Information.</i> The presentation will also be available for viewing on the project website www.durham.ca/outfallea</p> <p>Highlights of the Plant Performance Information was summarized by A. Willoughby as follows:</p> <ul style="list-style-type: none"> • It is a summary of the final effluent total phosphorous and soluble reactive phosphorous concentrations and loads on a monthly average basis of the Plant from January 2020 to August 2020. • This information is consistent with the information that the Region uploads to the project website www.durham.ca/outfallea on a monthly basis. • The Plant has consistently performed well below the current effluent total phosphorus concentration objectives and limits of 0.6 to 0.8 milligrams per litre (mg/L). • Soluble Reactive Phosphorus (SRP) Concentrations and Loads. The Plant does not have effluent objectives or limits specific to soluble reactive phosphorus, but the Plant has a performance objective to maintain the effluent SRP below 0.2 mg/L. The operation targets a range of 0.1 to 0.2 mg/L to maintain good biological treatment. • Regarding the variation in performance from January to March 2020 compared to the summer, the ferric chloride that is applied to the Plant to remove the soluble reactive phosphorus is dosed based on the influent flow rate through the Plant. During winter months there are higher influent flows to the Duffin Creek WPCP resulting from 	

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	<p>snow and ice melts. The Plant is dosing more chemical relative to the phosphorus concentration that is in raw wastewater. This operation results in precipitating more soluble active phosphorus at higher flows as opposed to dry periods during the summer months. This result is a similar trend in 2020 as was in 2019.</p>	
K. Chomicki	<p>ITEM #4</p> <p>PRESENTATION AND DISCUSSION OF NEARSHORE WATER QUALITY MONITORING</p> <p>Krista Chomicki, Great Lakes Specialist, Toronto and Region Conservation Authority, provided highlights of her PowerPoint presentation titled <u>Monitoring Program Overview and Surrounding Water Quality</u> Refer to Attachment #4 to view the complete presentation in detail. The presentation will also be available for viewing on the project website www.durham.ca/outfallea</p> <p>K. Chomicki provided the following overview of sampling program and information on what the nearshore is like</p> <ul style="list-style-type: none"> • 2006 TRCA went onto Lake Ontario to see if monitoring was feasible and in 2007 the monitoring program began between Rouge River to Carruthers Creek, from the shoreline extending out about 3 kilometres. Sites included Duffin Creek WPCP Outfall and the drinking water intake. Required two boats going out 5-8 times per year, covering spring, summer and fall. • 2010 the program was reevaluated, and an external reviewer suggested sampling be extended out to 5 kilometres and more samples with depth be taken. Two boats were required, and samples were taken along 4 transects from 100 meters out to 5 kilometres. Samples from depth were taken from 1 kilometre on. • 2014 reintroduced shoreline sites and marshes taking surface and bottom samples at sites from 1 kilometre on but omitted mid-depth because TRCA did not have temperature profiles and without knowing where samples were in the thermocline, data was not useful. • 2015 reduced offshore stations because analysis showed water quality at all the sites was very similar. Kept one station 5 kilometres from the shore. Took three boats and seven people to complete and ran until the end 2018. • In 2019 and 2020, staff attempted to get out four times a year to sites that include the outfall, the drinking water intake, a couple of sites closer to shore and the offshore station. • Sampling has evolved throughout the program. In 2015 investments were made to equipment and the LAB reduced their SRP detection limit from 2 down to 0.5 µg/L. 	

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	<ul style="list-style-type: none"> • 2016 attained a par sensor which gives information about light in the water column. • MECP deploy their LOBO instrument in the area every year which gives continuous information on temperature, currents, etc. • Between 2007 and 2018, TRCA completed 76 surveys and almost 68,000 chemical analyses of which the York Durham Regional Environmental Lab has analyzed about 98%. Environment and Climate Change Canada also ran some phosphorus analyses so TRCA could ensure the work being done was comparable with other labs. • Explained how marshes are sampled and how the Frisco Storm drain empties into the lake. • TRCA has a mapping interface on their website www.trca.ca/nearshore which provides information on different water quality parameters. • Explained the data in the charts/tables in the presentation that was gathered from 2007 to 2018 for phosphorus, nitrate + nitrite, ammonia + ammonium and E. coli which included data collected prior to the upgrades. Same patterns in decrease in concentration from the land to the lake and there are no SRP objectives for the nearshore. • Nitrate is less variable. Median concentration is higher at the outfall than the rest of the lake and variability is also high in storm water and creeks. • Ammonia and Ammonium highest variability in storm water. Land to lake decline. Median concentrations are in line with published numbers from the provincial government. • E. coli concentrations are higher in creeks, storm drains and marshes as opposed to the lake. Average values are below the recreational guideline. If it rains the day before E. coli could be higher in the nearshore. • Findings of high concentrations by the shoreline fall in line with the work that the province published. Found high and variable total phosphorus at the mouth creeks at Duffin and Carruthers. • In terms of water quality in the nearshore there is a lot of variability. Land to lake decreases. Below objectives for total phosphorus and E. coli is good with the exception of higher numbers after rainfall. • TRCA data falls in line with the published MECP data. • Algae work in Lake Ontario: general locations are shown in the map in the presentation. Most data are collected in the western Durham and Cobourg areas. Data ranges from 1970's and 1980's to the present with more focus after 2000. It restarted in 2006 in those areas. The province did not find a great relationship between total phosphorus or dissolved phosphorus with algae in their published work. They found high abundances of algae where total phosphorus was similar to open lake and concluded that nuisance levels are also 	

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	<p>in the areas without high external loading. Which questioned the effect of the internal lake bed and lake trophic status. Concentrations in Oshawa and Cobourg were often higher than those found in Ajax.</p> <ul style="list-style-type: none"> • In 2016, the federal government looked at <i>Cladophora</i> from Toronto to Pres'quile and created a <i>Cladophora</i> index (which incorporates coverage and height thru video) to compare different sites since direct sampling is expensive requiring divers. The government developed a technique to collect and analyze the data. With the dry spring and summer in 2016 phosphorus inputs to the nearshore sill occurred in the urban areas with significant algae in areas remote from the inputs which suggested a broader whole lake forcing is going on. Having algae by the shores in urban and not urban areas are being investigated. • The government is interested in creating <i>Cladophora</i> index stations in Halton, Toronto and Cobourg. It is not a funded program. TRCA collects algae and underwater video for the government in Toronto. TRCA also takes videos and sampling of algae at their maintenance nearshore sites and provides the video and samples to the government. <p>Other projections being undertaken by TRCA</p> <ul style="list-style-type: none"> • Frisco Storm Drain, after a rain event, high TP concentrations were noticed in the nearshore of Western Durham. There was a storm drain from an industrial park in the area that was emptying into the lake. TRCA received funding and they put in dams and graded the channel in order to slow nutrient delivery to the lake to allow in-channel processing to occur and after that, did not see the same spikes in the lake. Good results showed up in the lake. • TRCA are doing a joint project with the University of Waterloo and the governments. Monitoring the flow of twin storm sewers in the lower Carruthers watershed and sampling during storms. The University of Waterloo is looking for phosphorus speciation and hope to model stormwater loads. • TRCA are also working with the federal and provincial governments and The Ganaraska Region Conservation Authority (GRCA) to monitor twelve stations on the north shore of Lake Ontario for tributary loading purposes. They are sampling during storm events. The work is ongoing and hope to use this to calculate loadings to Lake Ontario. • TRCA has two postdoctoral fellows working on datasets. One focuses on marsh data in hopes of commenting on the effects that the coastal marshes may have on tributary loading. Coastal marshes have a lot of transformation happening in them and there can be internal loading. The second postdoctoral fellow is looking at what stressors affect <i>Cladophora</i> in western Durham and elsewhere in the Great Lakes. 	

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A. Grieve	The Facilitator Anneliese Grieve thanked Krista Chomicki for the informative presentation and welcomed questions and comments from the members on the information presented.	
J. Dies	Thanked K. Chomicki for the information noting that interest for PACPOW centers around the algae on the nearshore and are cognizant that around the Great Lakes there is an increase in algae mass and would like to see more testing for that. Asked if TRCA has looked at the data The Town of Ajax collected from Dr. Auer. K. Chomicki does not have the data and will have the postdoctoral fellow looking at stressors look into this. J. Dies offered to source out the published information and provide it to K. Chomicki.	
A. Grieve	The Facilitator Anneliese Grieve asked the committee members what aspects of the overview of Water Quality Monitoring they would like to hear more about at future meetings.	
S. Clearwater	Given the flooding, has upstream damming been considered as a type of measure for preventing storm water runoff and excess contamination going into the nearshore? K. Chomicki will look into this and noted that upstream damming could have an effect, depending on what type of dam it is and what purpose it is serving.	
S. Clearwater	Responded to S. Clearwater's comment about how effective the pond was and is it being considered? K. Chomicki is not aware of any other place where it is being considered. TRCA received funding for that project from the province and it was to treat all the small and moderate storms but not the larger ones, but it would be interesting to explore. TRCA provided the data from the Frisco project to the University of Waterloo who are doing research on storm water in the Richmond Hill and Ajax areas to improve watershed models. If they are able to do that, it might highlight areas that can be beneficial.	
S. Clearwater	Do golf courses contribute to this issue? K. Chomicki is not aware if TRCA as a conservation authority has data from golf courses but will follow up with watershed people on any information.	
M. Molinari	Great information on ratings in the various locations but would like to look back in the same way they do with some source water protection initiatives on what are the areas that are contributing to it and where are some of those risk areas that we should be looking at in more detail to reduce the flow of some phosphorous creating areas to reduce the overall level. And, if so much of this phosphorous is coming from the creeks how do you work backwards to find out how to reduce some of those items? Instead of looking at it as raw data what can be done and what are some strategies that area municipalities and area conservation authorities are looking at in order to improve the water quality and	

Attachments to these Minutes are

1) Duffin Creek Water Pollution Control Plant Advisory Committee Meeting No.2 Presentation

- 2) Phosphorus Reduction Action Plan and Outfall Diffuser
- 3) Plant Performance Information
- 4) Monitoring Program Overview and Surrounding Water Quality

Terms of Reference – Duffin Creek WPCP Advisory Committee