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Item No. 2
North West Community Council
July 17, 2017

TO: Chair and Members of North West Community Council

Original Signed

SUBMITTED BY:

Bob Bjerke, Director and Chief Planner, Planning & Development

DATE:

May 30, 2017

SUBJECT:

Bedford West Water Quality Status Update

INFORMATION REPORT

ORIGIN

Bedford Municipal Planning Strategy, Bedford West Secondary Planning Strategy, Policies BW-3, BW-4, and BW-5.

Development Agreements between Halifax Regional Municipality and West Bedford Holdings Ltd, and between Halifax Regional Municipality and Cresco Ltd.

LEGISLATIVE AUTHORITY

The Halifax Regional Municipality Charter, Part VIII, Planning and Development, Section 240, Development Agreements.

BACKGROUND

The Bedford West Secondary Planning Strategy, Policy BW-3, requires that a water quality monitoring program be undertaken for the Paper Mill Lake watershed to track the eutrophication process. Eutrophication is the process by which lakes naturally accumulate nutrients and biological material. This process is typically accelerated through the impacts of human activities, resulting in relatively rapid changes in trophic state, from lower states (fewer nutrients) to higher states (more nutrients), with corresponding changes in appearance, functional uses, and amenity values. The program was specified in the Planning Strategy in response to the Municipality's stated desire to "stem the decline of lakes from the accelerated process of eutrophication, and sedimentation and inputs from other urban runoff", as published in the former Regional Municipal Planning Strategy.¹

The terms of the monitoring program are specified within Development Agreements that have been negotiated in consultation with the Bedford Watershed Advisory Board¹² until its dissolution in 2013, and the Regional Watersheds Advisory Board since 2013. All such agreements have identified the value of 10 micrograms per Litre ($\mu\text{g/L}$) of Total Phosphorus as a "trigger value", representing the transition point between the second-lowest trophic state (oligotrophic) to the next-highest trophic state (mesotrophic) per Environment Canada criteria (see Table 1).

Trophic Status	TP ($\mu\text{g/L}$)
Ultra-oligotrophic	< 4
Oligotrophic	4-10
Mesotrophic	10-20
Meso-eutrophic	20-35
Eutrophic	35-100
Hypereutrophic	> 100

Table 1. Summary of Canadian trophic state trigger ranges. From Environment Canada (2004).

The municipality is required to submit test results to the Developer, the Community Council, and BWAB (now RWAB) within three months of being received from the consultant, or immediately, if total phosphorus ("TP") or bacterial results exceed management thresholds identified therein. Furthermore, in spring 2015, staff reviewed historic contractor reports submitted from spring 2012 through fall 2014 and realized that a high proportion of water quality samples had TP results exceeding the trigger value of $10\mu\text{g/L}$. This trend consequently initiated a three-phase assessment process to better understand the TP occurrences and to help devise a future approach to watershed management as follows:

Phase 1:

Report and discuss the TP exceedance findings with the developer and conduct a detailed assessment of existing water quality data from the Paper Mill Lake watershed to identify trends in Total Phosphorus measurements, considering CCME Guidelines.

Phase 2:

Investigate cause(s) of high TP measurements, considering all significant land uses and activities that have occurred in the Paper Mill Lake watershed since the inception of the monitoring program.

Phase 3:

Determine a course of action respecting watershed management and future land use development in the area.

¹ The current Regional Municipal Planning Strategy states this objective as follows: "This Plan will seek to ... maintain the existing trophic status of our lakes and waterways to the extent possible".

² RWAB assumed the functions previously performed by BWAB respecting Bedford West SPS once it began conducting meetings in July 2013.

DISCUSSION

This report presents an update to Council on the status of the assessment process regarding TP and water quality monitoring for Bedford West and the findings of the October 2016 monitoring event. Phase 1 (conduct detailed assessment of existing water quality data from the Paper Mill Lake watershed) was initiated in June 2015 and concluded in October of that year. The results of that phase were presented to NWCC in October 2015. Phase 2 (investigate cause(s) of high Total Phosphorus measurements) concluded in October 2016, with a presentation by Dalhousie University's Centre for Water Resource Studies delivered to NWCC in November 2016 and a staff report presented in January 2017.

October TP Monitoring Event Summary

The monitoring event held October 2016 found that total phosphorus concentrations exceeded the trigger value of 10 micrograms per Litre (10ug/L) at five of eleven stations monitored in October 2016. Staff will aim to submit any future reports of TP exceedance to Council more promptly.

A summary of TP results observed at all stations during the October 2016 monitoring event is presented below in Table 2. These results only represent water quality at the time that the samples were collected, and as such have little significance on their own. Their value may be realized in the determination of whether water quality is trending towards a mesotrophic (or higher) trophic state, and in indicating possible sources of excess nutrient contributions.

Sample Station	Concentration (µg/L)	Exceedance
KL1	8	No
KL2	13	Yes
KL3	4	No
KL4	7	No
KL5	3	No
HWY 102-1	9	No
HWY 102-2	12	Yes
LSD	12	Yes
LU	12	Yes
PML1	13	Yes
PML2	5	No

Table 2. Summary of TP results and exceedances October 2016.

As noted in Table 2, five stations exceeded the TP trigger value. Although applicable Development Agreements allow the Municipality to require follow-up testing to confirm these results, this option was not selected due to the assessment process currently underway based on previous TP results exceeding the 10µg/L trigger value (Table 3).

