HALIFAX
REGIONAL MUNICIPALITY

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Item No. 1
Halifax Regional Council
June 11, 2013

TO: Mayor Savage and Members of Halifax Regional Council

Original Signed by Director

SUBMITTED BY: Jane Fraser, Director, Planning & Infrastructure

DATE: April 23, 2013

SUBJECT: Ban on Lawn Fertilizers Containing Phosphorus

INFORMATION REPORT

ORIGIN

March 5, 2013, motion of Regional Council (Item 11.1).

LEGISLATIVE AUTHORITY

Lakes are under the Legislative Authority of the Province of Nova Scotia under The Environment Act.

The Municipality has Legislative Authority in the Halifax Regional Municipality (HRM) Charter to enact by-laws, manage development, create policies, and expend money in a variety of authorities that may impact water quality.

BACKGROUND

On March 5, 2013, Regional Council approved the following motion: *That Regional Council request a staff report outlining 1) The legislative authority, implications and precedence of a ban on lawn fertilizers containing phosphorus; and 2) How staff will respond to the Dartmouth Lakes Advisory Board request for HRM to develop a strategy to involve the community in helping manage their natural water resource.*

Problem Statement:
Increasing phosphorus concentrations in lakes across HRM are leading to anticipated changes in the trophic status and public enjoyment of community natural assets. This anticipation is resulting in increased public expectation of adoption of protective measures such as restriction of the use of fertilizers containing phosphorus.

Context of the Problem:
Urban Lakes: Halifax has a large number of lakes within its urban boundaries. Urban lakes are highly impacted by the watersheds draining into them. The high degree of impervious cover in urban areas due to land cover by concrete, asphalt, buildings, coupled with reduced vegetation cover, promotes the introduction of contaminants, including phosphorus, into the lakes.

Phosphorus and Lakes: Phosphorus is a natural element vital for the growth of plants and animals. In lakes, streams and rivers, phosphorus also helps promote the growth of aquatic plants, which in turn serve as habitat for aquatic creatures that are part of a healthy ecosystem.

As lakes age they tend to become more enriched in nutrients and therefore have more aquatic vegetation. However, too much phosphorus in natural aquatic systems due to human activities can lead to nuisance algae blooms, abundant weed growth and other lake conditions that are less favorable for recreation and aesthetics.

Various Phosphorus Sources:

Forest Soils	Past deforestation and loss of vegetation in the municipality likely resulted in considerable erosion of soils and organic matter, and the introduction of phosphorus into local lakes.
Agricultural Soils	Agricultural soils in HRM are not abundant and typically have low nutrient levels. They are not a prevailing concern in HRM.
Internal Phosphorus Loading	Once in a lake, the phosphorus can either be flushed farther down into the lake/river system, serve as nutrient to aquatic plant growth or end up in the bottom sediment. Anaerobic conditions at the water/sediment interface can release phosphorus back into the water column. Internal loading of phosphorus from sediments is likely an important source of phosphorus input to many shallow lakes in HRM.
Wastewater	Halifax Water's wastewater facilities reduce the amount of phosphorus released to the environment through treatment processes as regulated by Nova Scotia Environment.

Septic Systems	Effluent from these systems may introduce phosphorus into lakes and streams. Septic system approvals in the Halifax Regional Municipality are under the jurisdiction of Nova Scotia Environment.
Household Cleaning Products	In the late 1960s, Lake Erie experienced such an extreme case of eutrophication that fish were dying and the decomposing algae that washed up on beaches had to be removed with bulldozers. The main culprit for these algae bloom events was the phosphorus present in laundry detergents. Due to Federal regulations, laundry detergent phosphate contents were cut by approximately 90% and Lake Erie recovered. Household cleaners are no longer a source of concern for phosphorus.
Lawn Fertilizers	Phosphorus binds very tightly to soil particles; phosphorus commonly enters lake or river water via erosion of the soil. Thick & healthy lawns help to prevent soil erosion. Most of the phosphorus that enters a lake or river does so during late winter/spring snowmelt. A substantial portion of phosphorus from lawn fertilizers can enter lakes and rivers directly if the fertilizer is applied immediately before a large rainfall.

State of Phosphorus in Lakes within the HRM:
Eutrophication is the process by which lakes become naturally enriched in nutrients over long periods of time. There are relatively few historical or long-term studies of eutrophication in HRM or Nova Scotian lakes. Recent studies of local lake water quality indicate that most Halifax-area lakes have moderate nutrient contents (i.e. they are "mesotrophic"). These same studies indicate, however, that approximately 17% of studied lakes are already eutrophic or hyper-eutrophic (i.e. have high to very high levels of nutrients and plant growth) and that four of the six lakes in Dartmouth, within the circumferential highway, are experiencing increasing phosphorus concentrations. Other studies of water quality in HRM lakes have shown an increase in Total Phosphorus (TP) concentrations at 16 of 51 studied lakes, as inferred from the composition of phytoplankton (diatom) communities within sedimentary core samples.

DISCUSSION

Why Consider a Fertilizer Ban?
Precedence: There are city-wide, province-wide and state-wide restrictions in the use and/or sale of lawn fertilizers containing phosphorus in Sudbury, Manitoba, and at least eleven U.S. states, including Florida, Maryland, Minnesota, Washington & Wisconsin.

Efficacy: Scientific studies were conducted in Ann Arbor, Michigan, to assess the impacts of a lawn fertilizer ordinance in receiving waters. The restriction of fertilizer applications, availability of low-phosphorus fertilizers from retailers and other measures required by regulation, resulted in a reduction of phosphorus concentration of 11-23%.

Why not Consider a Fertilizer Ban?
In the early 2000's, when by-laws started emerging restricting phosphorus in fertilizers, most lawn fertilizers contained phosphorus; this is no longer the case. Currently, very few products

(with the exception of lawn starter products) are retailed to homeowners with phosphorus in them, and in the few products containing phosphorus, the amount is quite low (4% or less). New lawns do require phosphorus and all by-laws in effect exempt new lawns from application restrictions, along with agricultural applications, golf courses, and limited other land uses. Consequently, a fertilizer ban may not be effective in reducing phosphorus loading in urban lakes in HRM today.

Legislative Authority:
Staff anticipates that a wholesale product ban would require comparable legislation to the previous authority to enact a Pesticide By-Law (recently superseded with Provincial legislation).

Options:

	Pros	**Cons**
Municipal Fertilizer By-Law	• Responsive to community concerns; • Enables a "carrot and stick approach" to stewardship	• May be redundant with industry taking steps to remove phosphorus from products; • Expensive to administer and enforce (comparable to Pesticide By-Law $150,000 per year budget); • Absent/Uncertain legislative authority
Provincial Fertilizer Regulation	• Have legislative authority; • More cost effective to implement (comparable to Pesticide Regulations); • More effective to implement with a store ban (versus a municipal use restriction)	• May be redundant; • May be subject to time delays
Educational / Stewardship efforts	• Responsive to community concerns; • Can more broadly impact homeowner behaviours related to lakes; • No jurisdictional issues	• Financial and staff time implications (who pays?); • Requires collaboration with other stakeholders (Halifax Water, NS Environment, service providers, retailers)
Status Quo	• No cost	• Not responsive to community concerns

Overview of Phosphorus Fertilizer Regulations - Other Jurisdictions:
- Almost all prohibit the application of lawn fertilizer containing phosphorus throughout their jurisdiction, except as outlined in the exemptions; one jurisdiction applied regulations only to urban and rural residential areas.

- Common exemptions to restrictions include:
    1. Lawns that are being established or re-established from seed or sod during the first growing season;
    2. A recent soil test performed by a soil testing service indicates that the level of phosphorus in the soil is not sufficient to support a lawn; and
    3. Agricultural lands, golf courses, gardens, sod farms.
- Many regulations also prohibit the application of lawn fertilizer under the following conditions:
    1. When the ground is frozen;
    2. When heavy rainfall is occurring or when it is predicted;
    3. Within a specified distance (i.e. a buffer) of any waterbody; and
    4. When soils are saturated and a potential for fertilizer movement off-site exists.
- Prohibit application of fertilizers on impervious surfaces such as parking lots, driveways, sidewalks and roadways and require immediate removal when accidentally applied.
    - Some require commercial applicators to pay a fee to register with the municipality and to submit annual reports indicating where lawn fertilizers containing phosphorus were applied.

Effects of By-laws on Enforcement Efforts: A report prepared by the Minnesota Department of Agriculture in 2007, stated that there have been no reports of the State's Phosphorus Lawn Fertilizer Law being enforced by local government.

Best Management Practices: Findings from research into the effects of lawn fertilizers on runoff waters have led to the development of Best Management Practices (BMPs) for the application of lawn fertilizers. These BMPs include:

- Do not apply fertilizer if rainfall is forecast within 48 hours;
- Lightly 'water-in' the fertilizer immediately after application. This allows the phosphorus fertilizer to dissolve and the phosphorus to become bound to the soil particle, making it much less available to runoff and leaching loss;
- Do not apply fertilizer if the ground is frozen;
- Immediately pick up any fertilizer that has been inadvertently applied to impervious surfaces such as driveways or roadways where it will be washed away after the next rainfall;
- Apply a phosphorus fertilizer only if indicated by a soil test;
- Apply crushed dolomitic limestone to your lawn if a soil test reveals that the soil is too acidic. Reducing soil acidity will help make nutrients in the soil more available for plant growth.

FINANCIAL IMPLICATIONS

Currently, there is no allocated capacity within the 2013/14 Operating or Project Budgets.

Future budget impacts of the various options would be as follows:

Municipal By-Law	$150,000 to $200,000 per year
Provincial Regulations	No municipal budget implication
Education/Stewardship	$5,000 to $50,000 per year
Status Quo	No municipal budget implication

COMMUNITY ENGAGEMENT

Public support for the reduction of excess phosphorus inputs into lakes has been expressed by several groups in a variety of means:

- Members of the Nova Scotia Environmental Network, Watershed Caucus, were directly consulted regarding this report;
- In response to HRM's ongoing initial review of the Regional Plan ("RP+5"), a group called Our HRM Alliance formed and developed a set of policy recommendations called "Our Seven Solutions", for HRM's consideration. Solution Six is "Protect Water"; several detailed suggestions provided under this Solution would serve to reduce excess phosphorus inputs. The Oathill Lake Conservation Society, a non-profit community-based organization dedicated to Oathill Lake in Dartmouth, presented a suite of lake and watercourse policy recommendations for consideration by HRM's RP+5 process. Among these was the implementation of a public education program regarding the protection of lakes. The Society recommended a strong focus on the negative impacts of stormwater on lakes and specifically advocated the use of low to no-phosphate fertilizers;
- The Dartmouth Lakes Advisory Board, a former volunteer board comprised of appointed community members and open to the public, provided several policy recommendations to the Harbour East – Marine Drive Community Council in its final report on the Russell Lake Water Quality Policy Review Project, presented March 7, 2013; and
- In May 2011, HRM convened a workshop of interested citizens to identify recommendations for actions to enhance management and protect lake ecosystems within HRM. Participants identified a variety of pollution sources into lakes, including phosphorus from fertilizers, and recommended a suite of activities to reduce the introductions of pollutants, including phosphorus, into lakes.

ATTACHMENTS

None

A copy of this report can be obtained online at http://www.halifax.ca/council/agendasc/cagenda.html then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

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Original Signed

Report Approved by: _____

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