

# SUMMARY DOCUMENT OF THE REGULATORY FRAMEWORK ON SURFACE WATER MANAGEMENT AND EROSION CONTROL

## PUBLIC CONSULTATION

MONDAY, AUGUST 18, 2014 AT 7 P.M.

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BROME ROOM



# Toward sustainable management of our water

Climatic events that have occurred and disrupted the peaceful existence of the population and human activities are not a recent development. What has changed over the last 15 years, however, is the intensity of these events and their recurrence, and Quebec, unfortunately, is no exception to this phenomenon. The province, which is mainly affected by water-related incidents, is experiencing the full force of climatic changes that can no longer be denied, and it has to deal with the immense challenge of adapting, and not capitulating to the climatic events. Whether it is catastrophic flooding due to substantial amounts of rain or snow, unexpected landslides or destructive shoreline erosion due to the lack of winter ice, it has a considerable impact on human activities, from an economic, social and environmental standpoint. The Brome-Missisquoi region, in fact, is currently experiencing negative effects due to surface water. This includes problems relating to the appearance of cyanobacteria (blue-green algae) in many of our bodies of water, the abnormal Richelieu River flooding, and the normal flooding areas of the Yamaska River. These problems are also related to the regression of the overall quality of the water, the obsolescence and overuse of municipal rainwater infrastructures, the degradation of roadways, the increased risks relating to flash floods and rising water levels, to periods of drought and low water tables, and to the significant erosion on the shorelines of waterways.

**« While they have no control over weather conditions, municipalities can conduct efficient stormwater management. This is undoubtedly the best course of action to avoid having municipalities be blamed for water damage incurred by their citizens or be a victim themselves of such damage. »**

(Colette St-Martin, Risk management and compliance director at La Mutuelle des municipalités du Québec)



## Intentions of the MRC board

The challenge is even greater in Brome-Missisquoi because of its significant physiographical diversity and its sharing of the water network with the state of Vermont in the United States. Despite this, a willingness to improve the current situation is emerging in the ideals of local decision-makers. This is why, in its sustainable development vision, the MRC wants to become aquaresponsible. According to the iiAM: "Being aquaresponsible refers to all actions a municipality should undertake to ensure the good management of its water resources and infrastructures on its territory." Thus, the MRC intends to strengthen the provisions to protect shoreline buffer areas, keep soil on construction sites, apply the standards pertaining to agricultural activities, change maintenance and road-design practices, better manage construction in sloped areas, enforce sustainable management of stormwater in built-up areas, preserve vegetation and natural environments, and adopt a regulatory framework for every local municipality. To achieve this, all regional stakeholders need to mobilize to attain the main objective, which is to improve the territory's water quality.

In conclusion, this is a summary document designed to provide a framework for stormwater management, erosion control and soil conservation. It will provide information about the subjects that will be discussed at the public consultation at the MRC office on August 18, 2014. The proposed actions will focus on five themes: protection of shoreline buffer areas, stormwater management, restriction on construction in sloped areas, increasing woodlands, and erosion management. The grey sections explain the municipal regulation changes the MRC is proposing. This document provides you with the opportunity to learn about water management issues and it provokes thought and prompts you to form an opinion, which we would be delighted to hear!

# 1 Protecting shorelines

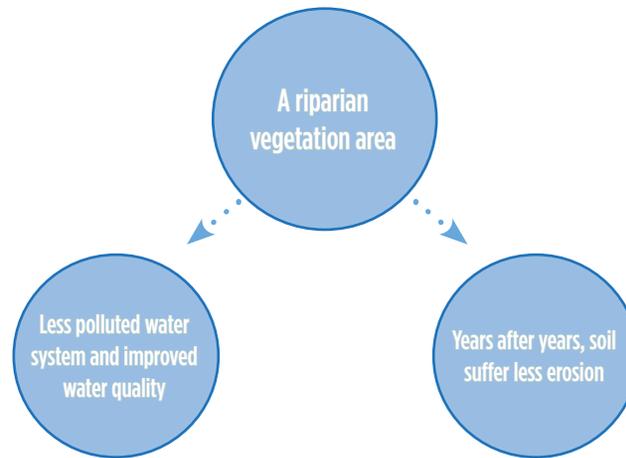
## It's so nice along the water!

Historically and even today, the notion of "keeping up the grounds" is more of a reference to the visual and aesthetic aspect one would like to give their back yard rather than validating the impact of our landscape development decisions on the natural environment. Despite the many awareness campaigns, there continues to be some uncertainty about the importance of the riparian vegetation area. This is why ensuring the shoreline is kept neat and clear is seemingly a matter of routine. But knowledge about this issue indicates just the opposite is occurring. Indeed, vegetation along the shoreline plays an integral role in terms of water quality.

## Why should I take care of my riparian vegetation area?

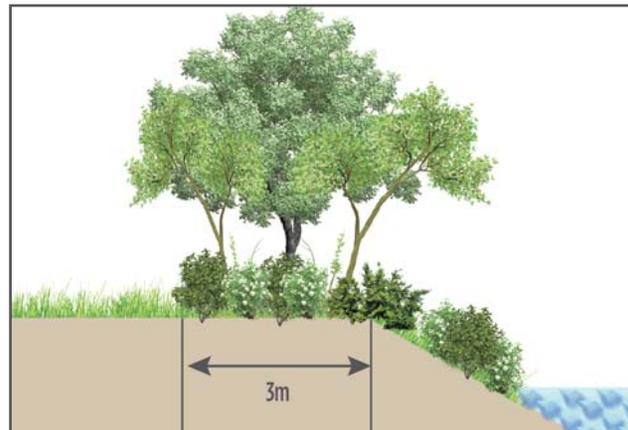
First of all, the importance of the riparian vegetation area refers to stormwater runoff, the phenomenon of the water's flow through the soil surface into the soil profile. In other words, when water doesn't infiltrate the soil, there is a runoff. Thus, when water isn't intercepted by vegetation or stored in groundwater, it flows through waterways, taking soil particles and certain contaminants along with it. Runoff water, which promotes erosion and pollution, is a major contributor to the premature aging of bodies of water. Faced with this major issue, the development and maintenance of the riparian vegetation area leads to the improvement of the quality of water in the water system. In this way, it forms the last filter through which surface runoff water will pass, and this results in the reduction and in some cases the prevention of problems such as:

- the capturing of nutrients and organic matter;
- the heating of the water;
- the presence of blue and green algae;
- sedimentation;
- contamination by toxic elements;
- and soil erosion.



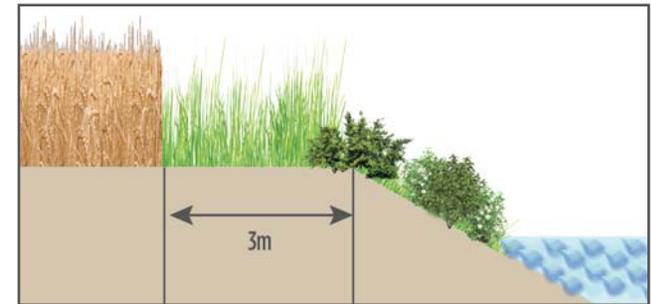
## A Ban grass cutting within less than 3 metres of a lake or waterway

Vegetation and natural covering of trees, shrubs or long herbaceous plants, is obligatory over a minimum width of three metres from the top of the slope. This buffer area can be left to grow wild or be developed by planting shrubs or other vegetation.



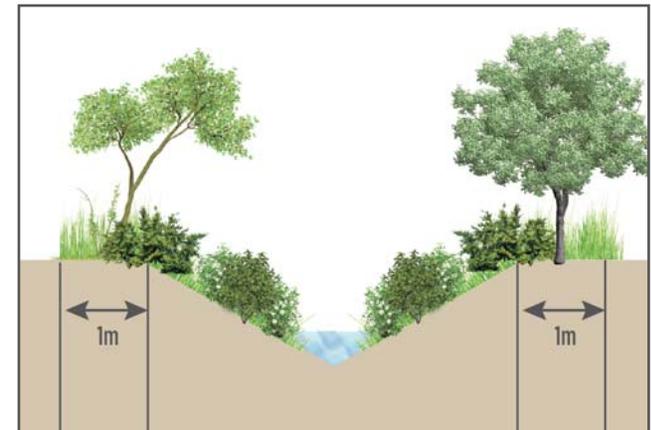
## B For farming activities, respect a riparian vegetation area of a minimum 3 metres from the top of the slope, and possibly mowing it as needed

While vegetation covering of three metres is obligatory, herbaceous vegetation harvesting is permitted for farming purposes, provided you leave a certain minimum height.



## C Respect a 1 metre riparian vegetation area for all ditches

The bank of a ditch, whether it's a drainage, dividing or public roadway ditch, must have natural vegetation covering over a minimum of one metre above the slope.



# 2 Sustainable stormwater management

## Water goes into sewers, doesn't it?

At the end of the 19th century, for sanitary reasons, combined sewage systems were built whereby everything went into the sewer. And by everything, we do mean everything! A quantitative control was put in place in the 1960s with the installation of separate systems and retention ponds. It was only in the 1980s that sedimentation pits were set up. Thus, the objective of traditional stormwater management was to collect runoff water as quickly as possible with the help of catch basins installed on paved road surfaces and send them into underground conduits, using a system of ditches. The water is then discharged directly into a waterway or lake. This type of system mainly addresses the quantity of runoff water that has to be evacuated from the town and is deemed to be a problem. Moreover, traditional practices change the hydrological parameters, increase the risks of flooding, lead to greater erosion and cause degradation in water quality. A new type of stormwater management has since emerged and it focuses on the quality of runoff water, soil erosion and regenerating sub-surface water tables.

## Make good use of rainwater

This so-called sustainable approach regards runoff water as a resource and is innovative in reusing rainwater. Thus, we should be optimizing, on a watershed basis, from neighbourhoods and plots of land, various set-ups that promote the retention of runoff water, water absorption by the soil, natural filtration and a slower flowing of runoff water.

The overall objective of sustainable stormwater management is to reduce the ecological impact of a project on a territory. The implementing of this basic principle is an essential sustainable development component for any community. There are many advantages for municipalities to use this type of management:

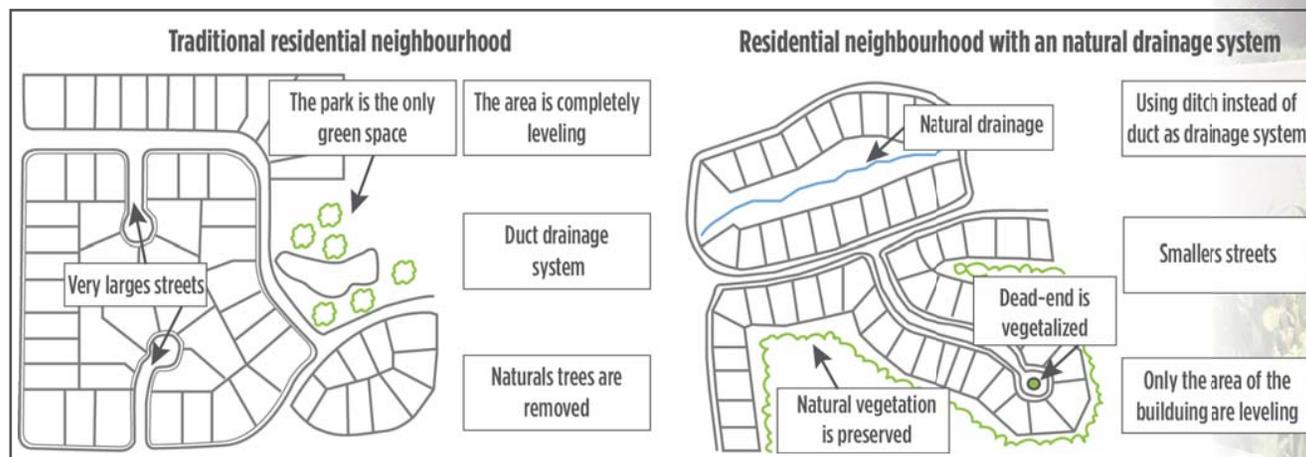
- reduced potable water treatment costs;
- maintenance and construction of infrastructures;
- increased lifespan for infrastructures;
- reduction in the amount of sewer spills;
- less risk of flooding and sewer backups
- and an improvement in water quality.

## A Review the standards for the designing of infrastructures for development projects aimed at respecting natural drainage

The objective of this review is to increase the infiltration of runoff water near the sites where the runoff water is produced, to preserve water quality of reception areas while trying to get the built-up areas to function as if they were still natural environments.

## B Divert the water from road ditches and disconnect the stormwater system gutters

In other words, divert the water from private road or woodland ditches to natural environments that are less than 20 metres from a waterway. For residences, it means redirecting water from the gutters to another area of your choosing: rainwater garden, soakaway or drainage wells, recuperation barrels, or whatever else you can think of. The possibilities are endless!



# 3 Building on a steep slope



## A great view, but at what cost?

Steep-slope areas are highly sought for their rather wild natural setting, the great views they provide and their proximity to recreational activities. Actually, building a main or secondary residence in a mountain setting is a dream that's fairly common. But these areas are regarded as vulnerable spots because the soil isn't overly thick and there is reduced water infiltration ability and increased risks of erosion. This is why it's recommended that deforestation and the construction of infrastructures in these areas should be limited, thereby reducing the related risks.

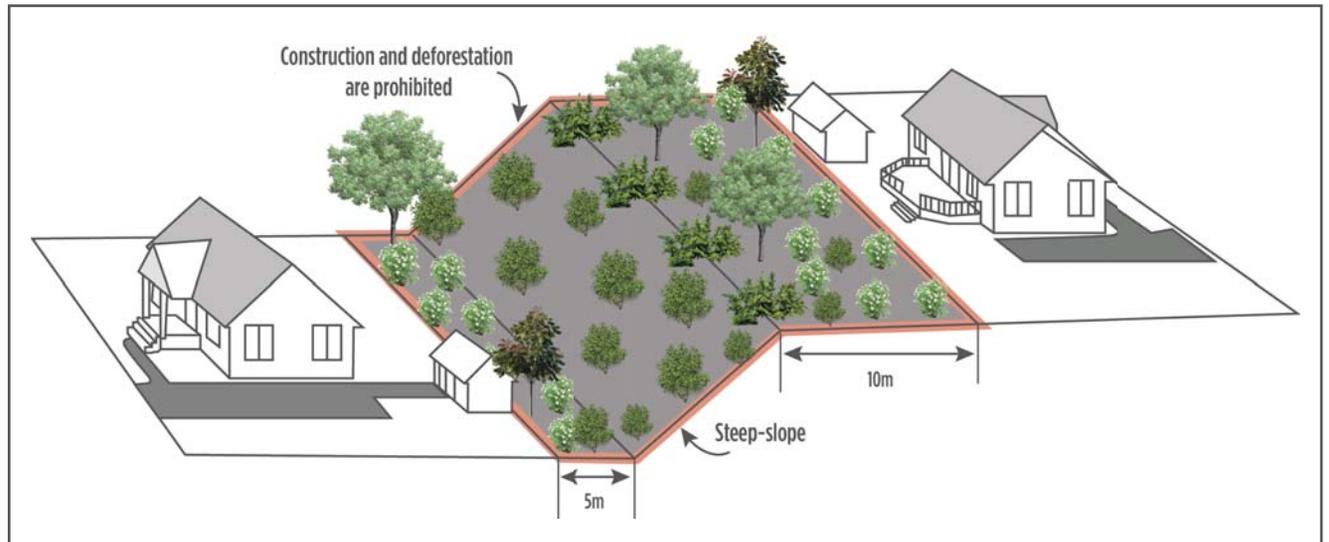
## Preserve trees for security

The aim of having a framework for deforestation and construction is to reduce excessive stormwater runoff and soil erosion problems. In addition to the impact on water quality, the security of people and property is the main concern of any land development that has steep sloping.

The length of the slope is an important factor to consider in protective measures in steep sloped areas. The length of the slope has a bearing on the speed at which the water flows. When the slope isn't as steep, the speed of the water runoff can quickly be slowed at the bottom of the slope. Conversely, the steeper the slope the greater the risks of "gulleying" (the forming of gouges in the soil) and soil erosion. These are the main factors that cause landslides.

## A Respect a buffer protection of more than 25% in sloped areas

No construction and deforestation is allowed 5 metres below the slope and 10 metres above. Vegetation inside this perimeter must be natural. In addition to these measures, steep slope areas are strictly regulated to reduce any related risks.



# 4 Cutting down trees and forest cover

## Demolish to rebuild

Generally, one tends to remove almost all existing vegetation to build a residential, commercial or industrial development. Then a minimum forest cover is restored. But, ground that is covered with only herbaceous plants, like grass, has a low retention and runoff water filtration capacity. To be truly effective, the vegetation cover must include trees and shrubs in addition to herbaceous plants, which have complementary roles. Meanwhile, the absence of vegetation cover might force people to seek substitutes for different roles than these plants are used for, with no guarantee of success. Moreover, these substitutes might be more difficult to build and maintain than what nature provides. It makes one wonder why there would be a need to recreate a natural environment that was already there from the start.

## Why have trees on my property?

Forest cover is an essential element in maintaining the water resource management process on a property, and especially in a watershed area. It allows you, among other things, to limit the amount of water that flows over the ground when there are heavy rains or prolonged showers. This area largely helps in reducing the impact of water on the ground, and in purifying and promoting its infiltration. The leaves of trees and shrubs help to slow down the impact of raindrops on the ground and tree roots can absorb large amounts of water. According to many studies, the ecological processes in a watershed area become inadequate when more than 50 to 60% of its territory is deforested. Consequently, when lots that have already been built fail to reach the minimal percentage of natural space, re-vegetation through tree and shrub planting is essential.

The following table expose the role of natural environment on surface water

Environment	Waterproofing percentage	Deep infiltration	Shallow infiltration	Runoff
Natural environment	0%	25%	25%	10%
Residential environment	30% to 50%	15%	20%	30%
Commercial environment	70% to 100%	1,50%	3,50%	75%

Gouvernement du Québec (2012). *Guide de gestion des eaux pluviales*

## A Maintain an existing ratio of forested or shrub areas in relation to the square footage of the property

You cannot cut down tree or shrub species on a property if it results in a reduction of forest cover that exceeds the percentage indicated on the following table:

Land area	Percentage of trees or shrubs to keep (%)
Less than 1 000 m <sup>2</sup>	10%
1 000 to 1 499 m <sup>2</sup>	20%
1 500 to 2 999 m <sup>2</sup>	40%
3 000m <sup>2</sup> to 4 999m <sup>2</sup>	60% and deforestation at most 1 500m <sup>2</sup>
5 000 m <sup>2</sup> and more	60% and deforestation at most 2 000m <sup>2</sup>

## B Respect the amount of required trees or shrubs in relation to the square footage of the property

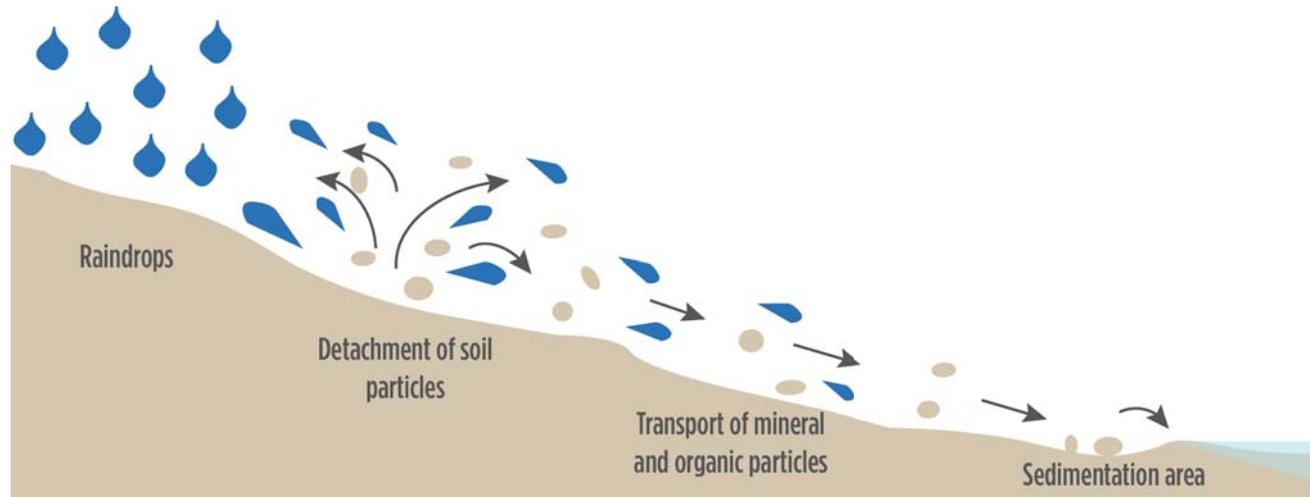
Every residential property, whether built or unbuilt, must respect the minimum amount of vegetation (shrubs and/or tree square footage) outlined in the following table. This does not apply to land for farm use

Land area	Minimal trees or shrubs required
Less than 1 000 m <sup>2</sup>	1 tree/15 shrubs
1 000 to 1 499 m <sup>2</sup>	2 trees/30 shrubs
1 500 to 2 999 m <sup>2</sup>	3 trees /45 shrubs
3 000m <sup>2</sup> to 4 999m <sup>2</sup>	4 trees /60 shrubs
5 000 m <sup>2</sup> and more	5 trees /75 shrubs

# 5 Erosion management and soil conservation

## What is erosion?

Erosion is a process through which soil particles are detached from their point of origin and are transported by runoff surface water, among other means. Ground soils become vulnerable when they are deprived of their natural protective layer which is vegetation. Raindrops that fall on bare ground dislodge mineral and organic particles as the runoff surface water transports them to sedimentation areas, where the ground is flat or where the slope is lower. Once the organic matter is transported by the runoff water to streams, rivers and lakes, they provide it with fertilizers, such as phosphates and nitrogen, which promote the growth of aquatic plants.



## **A** Protect land surfaces that have become barren and keep sediments on the land

While work is being done, sediment barriers made of geotextile fabric or straw bales should be put in place. And you also need to collect and filter the runoff water.

## **B** Once the work is over, re-vegetate the places that were redone

The places that were redone or stripped will have to be re-vegetated as soon as possible. If the work ends during the winter, any reseeded will have to be covered with mulch.

## How do I conserve soil?

To efficiently limit soil erosion, it is most important that you identify the various areas that follow the predominant processes, in terms of the formation of runoff water as well as the erosion itself. Then you need to protect the soil from the impact of raindrops. Construction activities of any kind inevitably expose the soil to erosion. Indeed, any construction site, whether big or small, creates acute erosion problems and is a critical phase for water quality. Insofar as grounds that have been redone are re-vegetated after the construction phase, and runoff water is properly managed, erosion problems during the usage phase will be very limited. In short, the aim is to reduce the formation of a superficial flow by increasing the infiltration and storage capacity.



Cowansville, Québec. June 2014

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