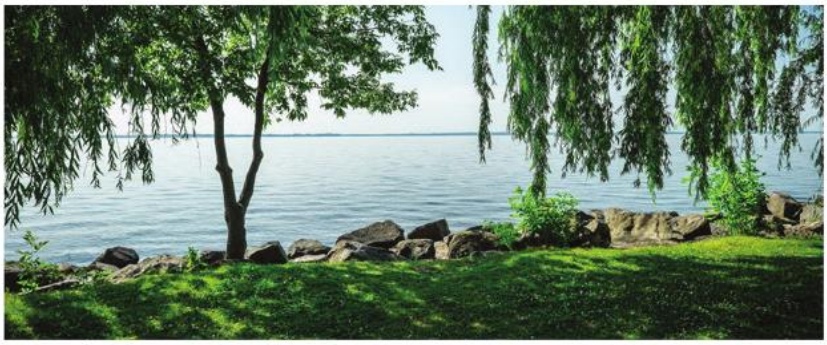

SUSTAINABLE DEVELOPMENT POLICY

2017

Pointe Claire

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List of Acronyms and Abbreviations

BMP	best management practice
CCAP	climate change action plan
CEHQ	Centre d'expertise hydrique du Québec [Quebec centre for hydrological expertise]
CH_4	methane
CMM	Communauté métropolitaine de Montréal [Montréal Metropolitan Community]
CO	carbon monoxide
CO_2	carbon dioxide
CO_2 Eq.	CO_2 equivalent
COLI	fecal coliforms per 100 ml
CTMO	organic waste processing centre
DSP	Direction de la santé publique [public health branch]
EIARP	environmental impact assessment and review procedure
EMS	environmental management system
EQA	Quebec Environment Quality Act

GHG	greenhouse gas
ICI	industrial, commercial or institutional establishment
IPCC	Intergovernmental Panel on Climate Change
MAMOT	Ministère des Affaires municipales et de l'Occupation du territoire [Quebec department of municipal affairs and land occupancy]
MDDELCC	Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques [Quebec department of sustainable development, environment and the fight against climate change]
MSSS	Ministère de la Santé et des Services sociaux [Quebec department of health and social services]
MTQ	Ministère des Transports du Québec [Quebec department of transportation]
NO_x	nitrogen oxide
OBV	watershed organization (*organisme de bassins versants*)
PAH	polycyclic aromatic hydrocarbon
$PM_{2.5}$	particulate matter
PMRA	Pest Management Regulatory Agency
RCM	regional county municipality
SEAO	Quebec government's e-tendering system
SPAIP	Site Planning and Architectural Integration Program
SPEDE	Quebec's cap-and-trade system for greenhouse gas emission allowances
SPP	Special Planning Program
VOC	volatile organic compound
WM	waste management
WMP	waste management plan
ZIP	area of prime concern (*zone d'intervention prioritaire*)

1. Introduction

1.1. Background

In 1987, the United Nations World Commission on Environment and Development published a report entitled *Our Common Future*, also known as the Brundtland Report, which defined sustainable development and provided guidance for future global, regional and even local policies.

Twenty years later, the Quebec government passed the *Sustainable Development Act*, then adopted the Government *Sustainable Development Strategy 2008–2013* followed by the *Government Sustainable Development Strategy 2015–2020*. These strategies seek to incorporate sustainable development considerations into how government agencies are managed. "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" and it is based on "a long-term approach which takes into account the inextricable nature of the environmental, social and economic dimensions of development activities."[1] Development in the province of Quebec must therefore take an integrated approach, rather than a silo approach.

To guide public administrations, the *Sustainable Development Act* establishes 16 principles, the main ones being as follows:

- Health and quality of life
- Social equity and solidarity
- Environmental protection
- Economic efficiency
- Biodiversity preservation
- Respect for ecosystem support capacity
- Responsible production and consumption

These principles are to be incorporated into the environmental, economic and social management of every entity so as to guide how each entity's objectives and directions are defined and implemented.

The environment is an increasingly key factor in how our companies are managed, and the need for a clean environment is recognized by most stakeholders (governments, municipal bodies, businesses, the public, etc.).

The global environmental challenges are substantial: pollution of waterways and groundwater, drought, smog, extreme weather events that endanger the health of populations and ecosystems, the impact of climate change on human, built and natural environments, and so on. The conservation, preservation and restoration of living environments is essential, and every territory is facing its own challenges, which specifically need to be addressed in a way that is adapted to its unique reality.

Municipal bodies are responsible for a number of environment-related sectors, such as water and waste management, air and soil quality, land use planning and ecosystem conservation.

By developing its own sustainable development policy and action plan, the City of Pointe-Claire is joining a global movement and mobilizing the entire community to improve the quality of its environment for the benefit of present and future generations.

2. Sustainable Development Policy's strategic directions

Sustainable development principles are an integral part of Pointe-Claire's culture and values. Jurisdiction over environmental matters is legally divided between the City, the Urban Agglomeration and the MDDELCC.

[1] Government of Québec. *Government Sustainable Development Strategy 2008-2013,* 2013b, 18

The sustainable development policy is a reference document that proposes a long-term vision to which various stakeholders—municipal, community and external—should refer when taking environmental actions. The Action Plan, which has been incorporated into the policy, offers concrete, short- and medium-term solutions over a five-year horizon, and it can be amended.

The sustainable development policy can help guide actions in a way that is consistent with overarching issues as well as federal and provincial government expectations. It also serves as the City's commitment to acquiring the resources and tools it needs to formally address environmental issues for the continual improvement of its citizens' quality of life.

Through the sustainable development policy's guiding principles and objectives, the City of Pointe-Claire is proposing an ideal to which every key environmental focus area should aspire. The policy is also a promotional tool designed to inspire residents and municipal administrators to work together for the benefit of present and future generations.

3. Mission and guiding principles

3.1. Mission

Pointe-Claire's mission statement for environmental protection is as follows:

"Make every effort to preserve the environment while working to continually improve the quality of life of present and future generations."

3.2. Guiding principles

- **Leadership:** Adopt an sustainable development policy and promote proactive sustainable development initiatives to enhance citizens' quality of life.
- **Integrity:** Act in accordance with sustainable development values.
- **Continual improvement:** Establish performance indicators to improve the environmental management of municipal services.
- **Preservation:** Act in such a manner as to preserve our rich natural heritage.
- **Awareness:** Raise community awareness of environmental issues.

4. Summary of Sustainable Development Policy

Table 1: Summary of Sustainable Development Policy

Sector	Objectives
Water	Objective 1: Continue with the City's efforts to reduce water consumption Objective 2: Limit the impact of runoff and wastewater
Air	Objective 3: Continue with the City's actions to fight climate change Objective 4: Preserve local air quality Objective 5: Promote actions that improve active and sustainable transportation in the community
Soil	Objective 6: Conserve soil quality Objective 7: Promote soil use from a sustainable development perspective
Municipal management	Objective 8: Incorporate a formal, internal environmental management system Objective 9: Facilitate application and monitoring of the sustainable development policy process Objective 10: Develop a responsible procurement policy Objective 11: Work with local actors to improve the quality of the environment
Waste	Objective 12: Deploy ongoing actions to improve waste management Objective 13: Develop actions to raise public awareness about waste-related issues
Biodiversity	Objective 14: Expand wooded areas
Nuisances	Objective 15: Implement environmental actions for the well-being of the public Objective 16: Identify and combat nuisances using ecological solutions

5. Environmental overview

This section presents the findings of the City of Pointe-Claire's environmental assessment. Recommendations have been made for each sector studied.

5.1. Background

5.1.1. Land

Pointe-Claire is part of the Montréal Urban Agglomeration and the Montréal Metropolitan Community (CMM). It belongs to the administrative region of Montréal and has an area of 18.94 km^2 (MAMOT 2016). Located southwest of Montréal Island on the banks of Lake Saint-Louis, Pointe-Claire is bordered by the municipalities of Beaconsfield, Kirkland, Dollard-des-Ormeaux and Dorval (CMM 2015). It also has two distinctive villages within its territory: Pointe-Claire Village and Valois Village (Ville de Pointe-Claire n.d., 6). Two major highways (20 and 40) run east-west through the City, and railway lines run parallel to the southernmost highway. The City's residential and landscape heritage are located in the south, while the north boasts an industrial park and "several shopping centres, including the Fairview Commercial Centre, which is one of the largest in eastern Canada" (Ville de Pointe-Claire n.d., 2).

According to the *Plan directeur du réseau cyclable de la Ville de Pointe-Claire (2015)* [2015 City of Pointe-Claire bicycle network master plan], 43% of the land area is residential, 26% is industrial and 7% commercial (Vélo Québec 2015). The City of Montréal reported that in 2010, nearly 10% of the land consisted of parks and green spaces (Ville de Montréal 2013a, 93). Terra-Cotta Natural Park makes up a large part of this space, with around 116 acres, including six kilometres of trails intertwined among a number of beautiful streams. The City manages this park as one of its greatest natural resources (Ville de Pointe-Claire 2012c). Table 1 provides a non-exhaustive list of several attractions and infrastructures in the city.

5.1.2. Population

According to the 2011 Census of Canada, Pointe-Claire's 30,790 residents make up 1.6% of the Montréal Urban Agglomeration's total population (Montréal en statistiques 2014, 5; Ville de Montréal 2013a, 93). According to information provided in the Planning Program, "[t]he population of Pointe-Claire increases by 3% per five-year period" and "this growth will be maintained and could even accelerate depending on future demand for new housing" (City of Pointe-Claire 2015a, 56). The population density is, therefore, expected to increase in the coming years.

Based on the 2011 Census of Canada, the City of Montréal produced a sociodemographic profile of the City of Pointe-Claire in 2014. Some of the main findings are as follows (Montréal en statistiques 2014, 5):

- The population density is 1,634.3 people/km^2 while in 2006, it was 1,600.9 people/km^2 (Montréal en statistiques 2014). By comparison, the population density of the Montréal Urban Agglomeration in 2011 was 3,948 people/km^2 (Ville de Montréal 2013b, 3).

- The median age is 46.2, compared to 39.2 for the Montréal Urban Agglomeration. Pointe-Claire's population has a higher proportion of seniors than the island as a whole. In fact, 21% of the city's population is 65 or older, compared to 16% for the Urban Agglomeration (Montréal en statistiques 2014, 5).

- Pointe-Claire has 8,445 families, 85% of which are couples and 15% of which are lone-parent families. Nearly 49% of children are age 14 or younger, which represents 4,665 youth. The number of families with children fell 2.6%, while the number of families without children rose 6.3% (Montréal en statistiques 2014, 12–13, 15).

- The city has 12,070 occupied private dwellings, 92% of which are considered to be in good condition. The majority are owner-occupied. The average property value is $347,518, and for rental properties, the average monthly rent is $1,098. While 10% of households have an income below $20,000, at the other end of the spectrum, 31% have an income above $100,000 (Montréal en statistiques 2014, 6).

- The average income of residents aged 15 and over is $43,500. Average household income is $85,569 and average family income is $102,705, although the average income for lone-parent families is lower, at $65,815 (Montréal en statistiques 2014, 6).

- Labour force status—which is the percentage of the total population aged 15 years and over that is in the labour force—is 64% (Montréal en statistiques 2014, 30).

- Nearly three-quarters (73%) of workers use a vehicle—as either a driver or a passenger—to get to work (Montréal en statistiques 2014, 6).

Table 2: Overview of attractions

Sector	Attractions and Infrastructures
Heritage and historical	• Approximately 194 buildings of heritage interest under the Site Planning and Architectural Integration Program (SPAIP) (Ville de Pointe-Claire 2016a) • Four buildings classified as "heritage sites" subject to the Bylaw for Recognition of the Pointe-Claire Institutional Core as a Heritage Site (PC-2808): Saint-Joachim church and its rectory, the convent, the Pointe-Claire windmill and Marguerite-Bourgeoys elementary school
Green spaces, natural parks and recreational parks	• 14 large parks with shelters and sports facilities, including several near Lake Saint-Louis (Ville de Montréal 2013a, 93) • 23 green spaces, including 21 with benches or playground equipment (Ville de Pointe-Claire 2012c) • One natural park: Terra-Cotta Natural Park (Vélo Québec 2015; Ville de Pointe-Claire 2012c) • Two community gardens (Ville de Pointe-Claire 2012e) and the potential for a third to be built (Lande 2016)
Community services	• 14 elementary and secondary schools • Two libraries (Main and Valois branch) • Lakeshore General Hospital and the West Island Health and Social Services Centre / CLSC du Lac-Saint-Louis [Lake Saint-Louis local community service centre] • Three AMT (Agence métropolitaine de transport) stations (Vélo Québec 2015)
Recreation and sports	• One aquatic centre with three pools, one weight room and multiple activity rooms (Ville de Montréal 2013a, 93) • One community centre (Noël-Legault Community Centre) and one cultural centre (Stewart Hall) • Bob Birnie Arena, with two ice rinks (Ville de Pointe-Claire 2012c) • 10 outdoor skating rinks • Seven heated outdoor pools (Ville de Pointe-Claire 2012c) • One canoe/kayak club • One public boat launch, one yacht club (sailing lessons and marina for up to 150 boats) (Yacht Club de Pointe-Claire n.d.) and one sailing club (Venture Sailing Club) • One golf club (Beaconsfield Golf Club)

	• A variety of facilities and clubs, such as soccer fields, tennis courts, two dog parks, an outdoor training circuit for adults, a lawn bowling green and a curling club
Commercial and industrial	• Several shopping centres, such as the Fairview mall, Complexe Pointe-Claire, Centre Terrarium, Plaza Pointe-Claire, Mégacentre des Sources and Promenades Pointe-Claire • Three commercial strips (Donegani Avenue, Chemin du Bord-du-Lac–Lakeshore, Cartier Avenue) • Two highways (20 and 40) • Canadian National and Canadian Pacific railway lines

5.1.3. Economic activity

Located less than 30 minutes from downtown Montréal, the City of Pointe-Claire is a major commercial and industrial hub in Montréal's West Island (Ville de Pointe-Claire 2012d). According to the Quebec department of municipal affairs and land occupancy (MAMOT 2016), the city has a fiscal potential of $7,360,908,500 (CMM 2016). In 2011, Pointe-Claire had 28,960 jobs (Statistics Canada 2012, in Ville de Montréal 2013c, 11). For 2006, 23.7% of jobs were in manufacturing and 17.7% were in retail (Ville de Pointe-Claire 2012d). In 2011, the unemployment rate was at 6.4%, up a mere 2% from 2006 (Statistics Canada 2013; Statistics Canada 2010).

A unique feature of Pointe-Claire is the size of its industrial and commercial sectors. "Located near highway 20 and highway 40, the industrial park offers quick and efficient freight transportation thanks to the proximity of Pierre-Elliott-Trudeau International Airport, the Port of Montréal, and the CN and CP railway lines" (Ville de Pointe-Claire n.d., 6). It is therefore an ideal location for businesses. The West Island CLD [local development centre] "provides support to industrial development at the level of regional and supraregional structures" (Ville de Pointe-Claire n.d., 8).

5.2. Study areas

5.2.1. Water

Drinking water

At the provincial level, according to the Quebec department of sustainable development, environment and the fight against climate change (MDDELCC), most administrative regions (1.5 million people) derive their water supply from groundwater. However, because the cities of Montréal and Laval draw their water supply solely from surface water, this has a major impact on the overall percentage (80%) (MDDELCC 2008a, 3).

According to the Quebec strategy for drinking water conservation, the level of drinking water consumption in Quebec is, on average, 35% higher than the Canadian average (MAMOT 2011, 8), as a result of the lifestyle of Quebecers and leaks in the water supply systems. Using 2001 as the baseline year, the Quebec government has set a target to reduce average per-person consumption by 20% (622 litres/person/day) by the end of 2017, and to reduce leaks to no more than 20% of the total volume of water produced (MAMOT 2011, 9).

In Montréal in 2006, the volume of water distributed was 1,036 litres/person/day, while the Quebec average was 795 litres/person/day (MAMOT 2011, 18). From 2001 to 2014, there was a 22% decrease in per-person water production for the Montréal Urban Agglomeration, which surpassed the government target. As for the distribution system, losses are still above the established limit, at an estimated 30% (Ville de Montréal 2015a, 5).

The remaining 70% is roughly distributed as follows: 40% to the residential sector, 58% to the industrial, commercial and institutional (ICI) sector, and 2% for municipal uses (Ville de Montréal 2015a, 8). The Montréal Urban Agglomeration is served by

six drinking water production plants that draw their supply mainly from the St. Lawrence River and its tributaries (Ville de Montréal 2015a, 6). The City of Montréal's water department is responsible for the drinking water supply of all 16 cities in the Montréal Urban Agglomeration, including Pointe-Claire (Ville de Montréal 2015a).

At the local level, the Pointe-Claire production plant draws its water supply from Lake Saint-Louis and serves four other municipalities: Beaconsfield, Baie-D'Urfé, Kirkland and a sector of Dollard-des-Ormeaux (MDDELCC 2016c; Ville de Montréal, n.d.b). The plant distributes 38.4% of its production to the 30,790 residents of Pointe-Claire (MDDELCC 2016c). Since January 2014, the plant has been operated by the Montréal Urban Agglomeration (Ville de Montréal n.d.c).

Since 2003, the plant has been part of the *Programme d'excellence en eau potable* (PEXEP), a sister program of the American Water Works Association's Partnership for Safe Water, designed to ensure delivery of high-quality drinking water above and beyond regulatory levels (Ville de Montréal n.d.c). Several analysis tools connected to alarm systems have been installed along the treatment chain and at the plant's outlet, allowing for rapid, targeted interventions when needed (Ville de Montréal n.d.c). Every week, tests are conducted at 25 points in the distribution network to detect any harmful bacteria.

Recommendations

- Continue with efforts to protect Lake Saint-Louis water quality.
- Raise public awareness about drinking water-related issues.
- Promote a steady decrease in drinking water consumption.
- Promote rainwater collection.

Groundwater

The City of Pointe-Claire draws its drinking water supply exclusively from surface water. For the entire Island of Montréal, only 0.01% of the population (namely, residents of Île-Bizard and Senneville) draws its supply from groundwater.

Recommendations

- Catalogue groundwater sources.
- Identify industries likely to contaminate soil and water.

Surface water

In accordance with the *Act respecting Land Use Planning and Development*, metropolitan communities and regional county municipalities (RCMs) must identify all lakeshore, riverbank and flood plain zones subject to restrictions for reasons of public safety and environmental protection.

Lake Saint-Louis

The City of Pointe-Claire, along with several other cities and municipalities, sits on the north shore of Lake Saint-Louis. The lake has a surface area of 148 km^2 and an average depth of 3 m, although it reaches depths of 28 m in places. Lake Saint-Louis is actually a widening of the St. Lawrence River where the waters of the Great Lakes and the Ottawa River come together (Comité ZIP Ville-Marie 2014, 42). Lake Saint-Louis, Lake Saint-Pierre and Lake Saint-François are part of the fluvial section of the St. Lawrence (St. Lawrence Action Plan 2012). With its numerous recreational harbours and boat landings, Lake Saint-Louis is a focal point for water sports in the Montréal region. Although its beaches are officially closed, the Sainte-Anne-de-Bellevue, Baie-d'Urfé and Pointe-Claire sectors are commonly used for swimming (MDDELCC 2016d).

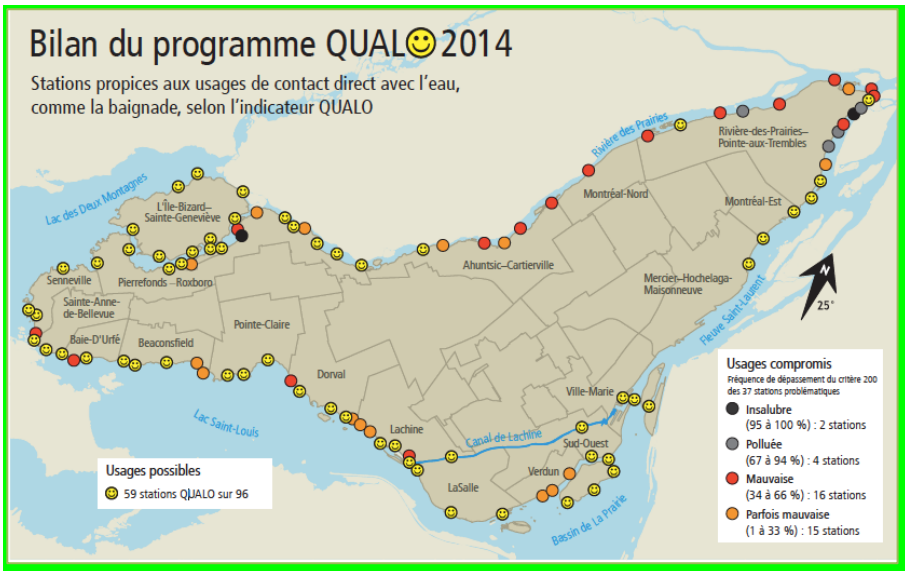
Because Lake Saint-Louis is a tributary of the St. Lawrence, its water quality must be preserved for the health of the river's ecosystem as well as the public. In addition to the three drinking water production plants on the lake (including the Pointe-Claire

plant), many residents also come in direct contact with the lake's water when participating in their water sports (MDDELCC 2016d).

Every year, the City of Montréal collects surface water from the area to test for the presence of fecal coliforms (QUALO program). About 25 of the 96 sampling stations are located around Lake Saint-Louis, including three in Pointe-Claire. The Pointe-Claire stations were all QUALO approved (Ville de Montréal 2015b, 4). However, "[i]n 2014, of the 25 stations located on Lake Saint-Louis, 16 compared to 17 in 2013 were QUALO" approved. "After 10 consecutive years of good results, the stations located at Monk Park (Lachine) and the Beaconsfield Yacht Club lost their QUALO rating, for no specific reason. The samples measured at the Saint-James (Beaconsfield) and Bertold (Baie-D'Urfé) Park stations also exceeded 400 COLI (fecal coliforms per 100 ml) on three occasions. Exceedances of more than 50% of the 200 COLI threshold were obtained at the Godin Park (Sainte-Anne-de-Bellevue) and Baie-de-Valois Park (Dorval) stations" (Ville de Montréal 2015b, 5). In addition, the presence of an abandoned cargo ship (the *Kathryn Spirit*) near the St. Lawrence Seaway locks in Beauharnois threatens to contaminate Lake Saint-Louis with fuel oil (Major 2016). Figure 1 shows the report of sites fit for activities involving direct contact with Lake Saint-Louis water. Three sites have been identified in Pointe-Claire: the Canoe Club, Edgewater Park and Alexandre Bourgeau Park. Results from all three sites indicate that the water is of very good bacteriological quality, even though it occasionally exceeded the 200 COLI threshold for direct water contact. To obtain QUALO certification, two conditions must be met:

1. The annual average of weekly results must be below the 200 COLI threshold (for direct contact water use).
2. Only 10% of results may exceed the value of 400 COLI.

Figure 1. Report on the 2014 QUALO program

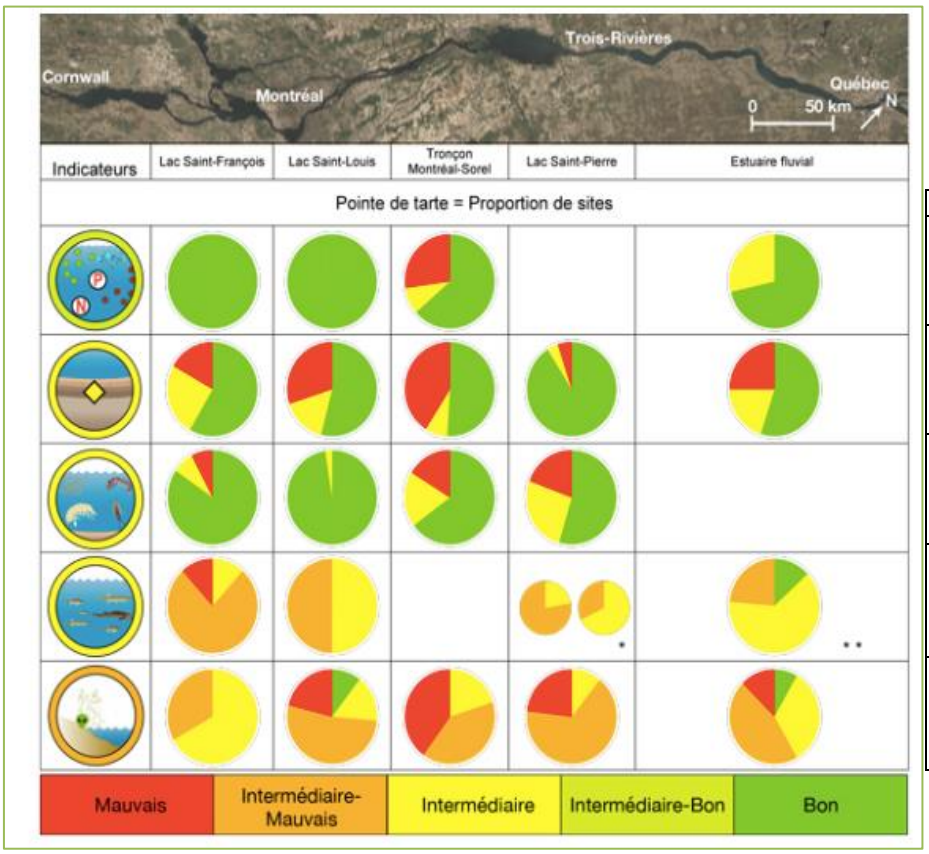


Source: Ville de Montréal 2015b, 4

In an overview on the state of the St. Lawrence (2014), an analysis of the health of Lake Saint-Louis was produced, based on data from 2004 to 2010, as part of the Canada-Quebec Agreement on the St. Lawrence, also called the St. Lawrence Action Plan 2011-2026 (Working Group on the State of the St. Lawrence 2014). In general, the water quality (physical, chemical and bacteriological properties) of Lake Saint-Louis is classified as good or satisfactory. Also, in 98% of sampling sites, the benthic

macroinvertebrate community[2] is present and meets ecological standards. In terms of toxic contamination of sediments in Lake Saint-Louis, 54% of the study areas are considered non-contaminated. However, 46% of the areas contain contamination classified as either of concern (30%) or to be monitored (16%). Also, the state of health of fish communities is classified as poor (50%) or moderate (50%). Depending on the species, these results may be explained by certain pressures, such as habitat fragmentation or degradation, loss of spawning grounds and overfishing. Also according to the analysis, Lake Saint-Louis is under attack by invasive plant species. Results show an invasion indicator of nil in 10% of study areas, low in 16%, moderate in 53%, and high in 21% of study areas (Working Group on the State of the St. Lawrence 2014).

Table 3: Results of sampled sites along Cornwall-Québec fluvial corridor



Indicators	Legend
	Physical, chemical and bacteriological parameters
	Contamination of water by toxic substances
	Benthic communities
	Fish communities
	Invasive species

Source: Working Group on the State of the St. Lawrence 2014, 11

St. Lawrence River

The St. Lawrence River is the third largest river in North America. The river and its 600 islands are internationally recognized for their biodiversity. The vast majority (80%) of Quebec's population lives along its banks or tributaries, and a lesser proportion (40%) draws its drinking water from it.

The St. Lawrence is a unique ecosystem of great biological diversity, with numerous bird, marine mammal, fish and plant species. It has "118 species of freshwater fish" including "about 15 migratory species [that] use saltwater and freshwater habitats alternatively to complete their life cycles. More than half of these species are in a vulnerable situation due to the anthropogenic problems that they encounter in freshwater" (Working Group on the State of the St. Lawrence 2014, 16).

[2] Benthic macroinvertebrates, or benthos, are organisms without a vertebral column that are visible to the naked eye, such as insects, shellfish, crustaceans and worms that live on the bottom of lakes and waterways. They are a food source for many fish, amphibian and bird species. They are known for being good indicators of the health of aquatic ecosystems. They absorb the cumulative and synergistic effects of physical, biological and chemical disturbances in waterways and can, therefore, be used to assess how the pollution and alteration of aquatic and shoreline habitats actually impacts ecosystems (MDDELCC 2016j).

In 2011, an action plan for integrated management of the river was put in place by the governments of Canada and Quebec to preserve its water quality and habitats. Given the accelerated deterioration of water quality, the river's important role in the preservation of land and marine biodiversity, its major role in supplying the Quebec population with drinking water, and its impact on economic development and tourism in the province, the St. Lawrence Action Plan 2011-2026 was developed (MDDELCC 2016e). In addition to federal and provincial departments, various other stakeholders are involved in the plan as well, such as First Nations, municipalities, areas of prime concern (ZIPs), non-profit organizations, collaborative bodies and the private sector (St. Lawrence Action Plan 2014).

Area streams

The City of Montréal report entitled Portrait of the Quality of Montréal's Water Bodies (2015b) indicates the presence of three streams in Pointe-Claire: the Terra-Cotta, Saint-James and Denis streams. According to the RUISSO program, their water quality is deemed "poor" to "polluted" for the first two streams and "fair" for a large portion of the third (Ville de Montréal 2015b, 6).

Recommendations

- Promote the protection of Lake Saint-Louis through collaborative bodies such as the Ville-Marie ZIP committee, the regional round table and the Greater Montréal round table.
- Promote collaboration between Lake Saint-Louis shoreline municipalities.
- Keep citizens regularly informed of Lake Saint-Louis water quality.
- Raise public awareness about Lake Saint-Louis and St. Lawrence River issues.

Domestic wastewater

Water and sewer systems

In the Montréal region, 99.9% of the population is connected to municipal sewer systems and, since 1995, to wastewater treatment plants. The region has around 2,400 septic tanks, though none of which are in Pointe-Claire (MDDELCC 2016d).

For residential connections, the City of Pointe-Claire provides homeowners with directives and advice on how to keep backwater valves in good condition and sewer cleanouts clear, to prevent backups and flooding. The City also offers a paid service for clearing blocked sewer connections (Ville de Pointe-Claire 2012a).

In addition to making major investments in the maintenance and improvement of its system, once a year the City performs unidirectional flushing of its water system to remove any mineral build-up on pipe walls (Ville de Pointe-Claire 2012a).

In its Climate Change Adaptation Plan (2015b), the City of Pointe-Claire provides for the implementation of measures related to the water and sewer system. Here are a few examples (p. 4):

- Establish a bylaw for the sustainable development of parking lots.
- Where possible, incorporate water collection systems into new residential and industrial developments.
- Incorporate maximum discharge flow rate criteria into all new builds.
- Continue using rainwater collection and holding tanks in the Public Works building to water the grass and plants.
- Raise public awareness about the importance of buildings being able to withstand stormwater runoff.
- Clean sumps.

Recommendations

- Ensure sound management of domestic wastewater by implementing the Climate Change Adaptation Plan and by continuing to implement the measures currently being taken.

5.2.2. Air

Combatting climate change

It is now understood that human activity affects the climate balance, particularly through deforestation and the increased use of fossil fuels and land. Greenhouse gas (GHG) emissions are constantly on the rise. Atmospheric concentrations of carbon dioxide (CO_2) reached 400 parts per million (ppm) in 2013, whereas the carbon cycle's equilibrium ratio is actually at 280 ppm—the level it was at in the pre-industrial age. Global GHG emissions attributable to human activities increased by approximately 70% between 1970 and 2004 (IPCC 2007). Canada is one of the highest per capita GHG emitters in the world (Environment and Climate Change Canada 2016).

At the provincial level, although Quebec had a 7.8% decrease from its 2005 emissions level, Quebec is still Canada's third highest GHG emitter, after Ontario and Alberta (Environment and Climate Change Canada 2016). As part of its 2013-2020 Climate Change Action Plan (CCAP), the Québec government has set a GHG emission reduction target of 20% below the 1990 level (MDDELCC 2012). Municipalities have an important role to play in helping achieve the provincial target. It is even estimated that municipal agencies could have an influence on nearly 50% of the province's emissions (MDDELCC 2008b, 24).

The City of Montréal produced a 2013-2020 Montréal Community Greenhouse Gas Emissions Reduction Plan in which it targets a reduction to 30% below the 1990 level for the entire Urban Agglomeration (Ville de Montréal 2013b). The plan offers potential solutions and actions for the residential, commercial, institutional, transportation and waste sectors (Ville de Montréal 2013b, 3).

Although the industries operating in the City of Montréal are responsible for 24% of its total GHG emissions, in light of the new provincial regulation,[3] the City will focus its efforts on other sectors. Since 2013, the Quebec government has been imposing emission limits on industries that generate more than 25 kilotonnes of CO_2 Eq. per year (Ville de Montréal 2013b, 50). Below is a list of actions the City of Montréal has identified in its GHG reduction plan:

- Improve the energy efficiency of buildings and reduce fuel oil consumption.
- Encourage the use of renewable energy.
- Adequately fund transportation-related GHG emission reduction projects, such as developing public transit and other alternatives to single-occupancy transportation (car sharing and taxi), optimizing parking and promoting active transportation.
- Reduce vehicle GHG emissions.
- Facilitate the governance of transportation projects.
- Create four organic waste processing centres (CTMOs) by 2020.

In 2013, the City of Montréal produced a GHG inventory for 2010 for all cities and municipalities in the Urban Agglomeration. A new inventory of Montréal community GHG emissions will be published in 2017 (Ville de Montréal 2013a). The inventory also provided certain data for the City of Pointe-Claire. Here are a few highlights:

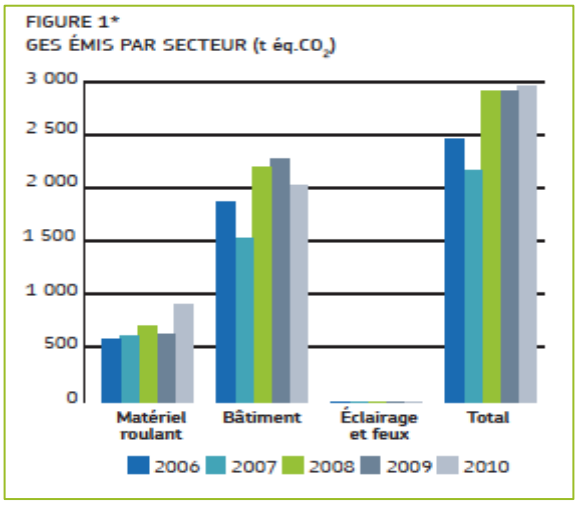
- In 2010, City of Pointe-Claire corporate activities emitted 3,001 tonnes of CO_2 Eq., representing a 20% increase from 2006 emissions (Ville de Montréal 2013a, 104).
- Out of a total of 33 GHG emitters, Pointe-Claire is the third highest in terms of total emissions from its municipal buildings (Ville de Montréal 2013a, 36).

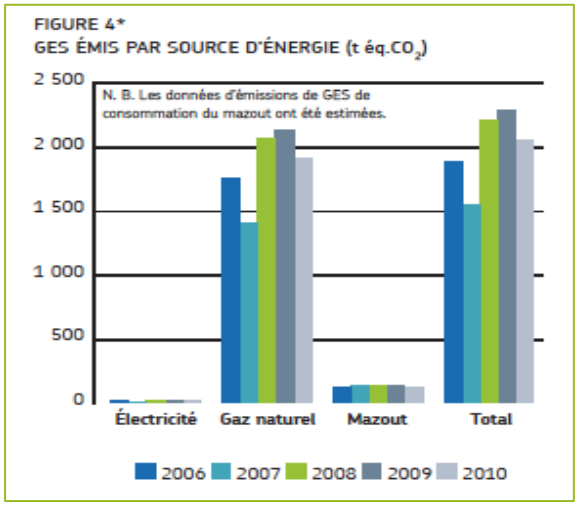
[3] *Regulation respecting a cap-and-trade system for greenhouse gas emission allowances* (SPEDE).

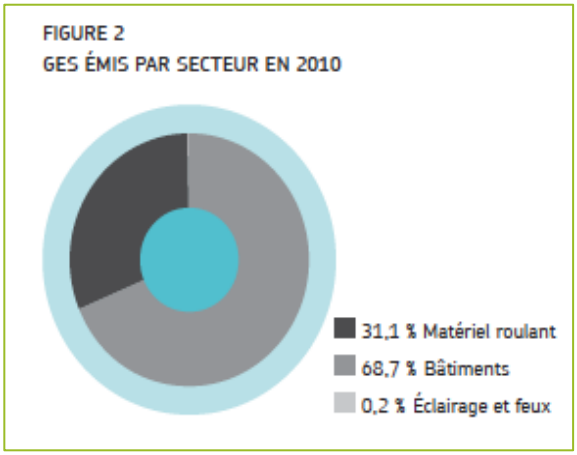
- Building energy consumption is higher than the Montréal average and has risen 9% since 2006 (Ville de Montréal 2013a, 38 and 105).
- Two buildings saw a particular increase in their natural gas consumption and GHG emissions between 2006 and 2010, namely, the Bob Birnie Arena and the Aquatic Centre. Together, these buildings generate 46% of the City's emissions.
- Rolling stock GHG emissions originate primarily from heavy-duty vehicles (Figure 2). In 2010, transportation-sector GHG emissions increased by about 40%.
- Estimated GHG emissions for subcontracted activities (snow removal, and waste collection and removal) are 719 tonnes of CO_2 Eq.

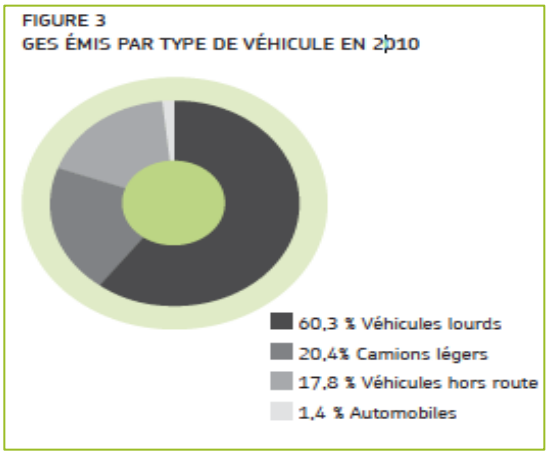
The following figures provide an overview of changes in the City of Pointe-Claire's emissions. GHG emissions shown in these figures do not include subcontracted activities.

Figure 2. Overview of changes in GHG emissions









Source: Ville de Montréal 2013a, 104-105

In 2015, the Pointe-Claire City Council adopted the Climate Change Adaptation Plan to identify actions that the municipality wants to implement to deal with climatic disruptions. The plan proposes a variety of measures and objectives divided into five categories: heat waves, rainfall, temperatures, storms and drought (Ville de Pointe-Claire 2015b, 2). These measures will enhance the City's environmental performance, particularly by reducing heat islands, protecting biodiversity, and adapting and improving the resilience of infrastructures (buildings and sewer systems) and greencover (Ville de Pointe-Claire 2015b, 2).

Recommendations

- Determine whether any industries affected by the new provincial regulation are operating in the city.
- Reduce GHG emissions generated by the City.
- Implement the Climate Change Adaptation Plan.

Transportation and sustainable mobility

In its 2013–2020 GHG Emissions Reduction Plan, the City of Montréal indicates that, in general, residents of the Urban Agglomeration use public transit and active transportation to a greater extent than the provincial average. However, the proportion of residents using these modes of transportation tends to decrease the farther they live from the island's central neighbourhoods (Ville de Montréal 2013b, 14).

Table 4: Getting around and means of transportation

Percentage of trips	City of Pointe-Claire[4]	Urban Agglomeration	Province of Quebec
Car	73.3%	52%	75%
Public transportation	20.6%	31%	13%
Active transportation (walking or biking)	5.2%	14%	7%

Source: AMT 2008 origin-destination survey and Statistics Canada 2011 National Survey, cited in Ville de Montréal 2013b, 14

[4] Percentage of trips to work, taken from the City of Montréal sociodemographic profile (Montréal en statistique 2014, 33).

In recent years, the City of Pointe-Claire has continued its efforts to promote active transportation by improving its walking and cycling infrastructures. In 2015, the City produced a Bicycle Network Master Plan (*Plan directeur du réseau cyclable*) in partnership with Vélo Québec. Pointe-Claire has 13 kilometres of bike paths, and the master plan proposes two scenarios for expansion. The document also identifies "traffic generators," such as schools; train, bus, and subway stations; businesses; and recreational venues (Vélo Québec 2015).

The achievement of certain objectives identified[5] in the Village of Pointe-Claire Special Planning Program (SPP) will foster the development of sustainable mobility (Ville de Pointe-Claire 2016b, 40–42) and will help to:

- Create safe, appealing and user-friendly pedestrian corridors;
- Improve cycling access and incorporate it into the built environment;
- Optimize parking lot access and use;
- Develop a waterfront pathway on Lake Saint-Louis.

Figure 3. Sustainable mobility

Source: Vélo Québec 2016

Recommendations

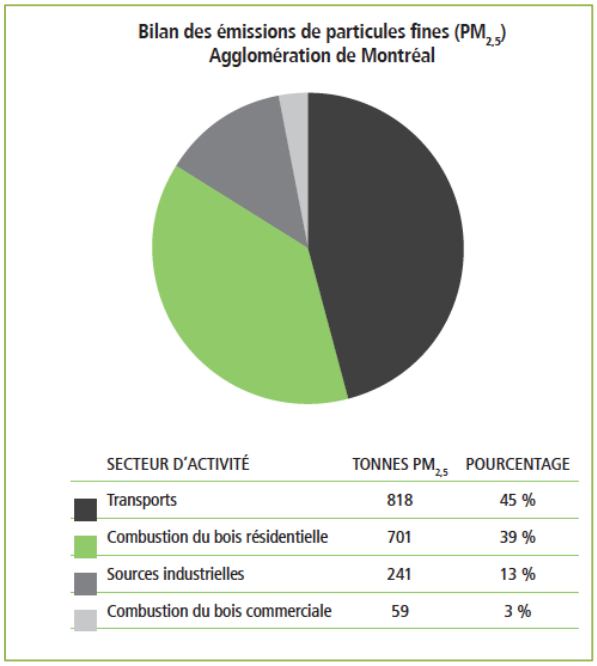
- Work with local associations to achieve the City's sustainable mobility objectives.
- Support the implementation of actions to increase the use of sustainable transportation.
- Raise public awareness about sustainable transportation through action programs.

Air quality

[5] Objectives have been established based on issues previously identified in the SPP, such as difficult access to certain parks, vast unused spaces, lack of vegetation in the village or worsening heat islands in parking lots or mineralized school yards (Ville de Pointe-Claire 2016b, 16).

For the Montréal Urban Agglomeration, the *Réseau de surveillance de la qualité de l'air* (RSQA) [air quality monitoring network] continually analyzes the concentration of pollutants from 13 sampling stations to measure air quality in the city (Ville de Montréal 2015c). In 2014, there were 63 poor air quality days, including six days of smog, mainly in wintertime. The poor air quality on those days was due to particulate matter in the air. The following figure illustrates the main sources.

Figure 4. Particulate matter emissions



SECTEUR D'ACTIVITÉ	TONNES $PM_{2,5}$	POURCENTAGE
Transports	818	45 %
Combustion du bois résidentielle	701	39 %
Sources industrielles	241	13 %
Combustion du bois commerciale	59	3 %

Source: Ville de Montréal 2015c, 11

Other factors can have an influence as well, such as wood-burning stoves, the Loto-Québec fireworks and building fires. Also, "[c]oncentrations of gas pollutants associated with road traffic (carbon monoxide and nitrogen dioxide) vary depending on the time of day...[and] [t]hese concentrations are lower during the weekends" (Ville de Montréal 2015c, 2).

There are no air quality sampling stations in Pointe-Claire. However, there are two stations nearby: one at the Pierre Elliot Trudeau Airport in Dorval (66) and one in Sainte-Anne-de-Bellevue (99) (Ville de Montréal 2015b, 3).

Table 5: RSQA [air quality monitoring network] sampling stations (2014)

Station	Measured Elements	Number of days in 2014 categorized as:		
		Good	Acceptable	Poor
Montréal–Dorval airport (66)	Carbon monoxide, nitrogen monoxide and dioxide, ozone, particulate matter (diameter <2.5 microns), volatile organic compounds	204	154	7
Sainte-Anne-de-Bellevue (99)	Nitrogen monoxide and dioxide, total suspended particulates, particulate matter (diameter <10 microns), particulate matter (diameter <2.5 microns), volatile organic compounds, sulphur dioxide, ozone	204	158	3

Although new Canadian air quality standards were passed in 2015, an analysis showed that, from 2012 to 2014, the Montréal Urban Agglomeration was already compliant with the new limits before their adoption (Ville de Montréal 2015c, 2).

Open fires and wood-burning appliances

Open fires and wood-burning stoves are significant sources of atmospheric pollution. They emit carbon monoxide (CO), volatile organic compounds (VOCs), particulate matter ($PM_{2.5}$), nitrogen oxides (NO_X) and polycyclic aromatic hydrocarbons (PAHs) (Bisson et al. 2010, 37). According to the MDDELCC (2002b), 44.1% of particulate matter emissions in Quebec are due to wood burning in the residential sector, which is greater than industrial (39.4%) and transportation (15.3%) sector emissions (MDDELCC 2002b). In Montréal, residential wood heating is reportedly the second source of $PM_{2.5}$ emissions after transportation, all categories included (maritime, road, airport) (Ville de Montréal 2015c). Furthermore, the City of Montréal passed a bylaw "intended to prohibit, as of December 31, 2020, the use of any device or fireplace that uses solid fuel, save for those certified devices that emit no more than 2.5g/h fine particles in the atmosphere." Pointe-Claire is examining the possibility of enacting a similar bylaw. Currently, wood-heating appliances (fireplaces) are regulated to reduce their impact in terms of particulate matter emissions (Construction Bylaw PC-2786).

Heating appliances must meet the U.S. EPA's New Source Performance Standards for residential wood heaters or the CAN/CSA Standard CAN/CSA-B415.1, Performance Testing of Solid-Fuel-Burning Heating Appliances, published by the Canadian Standards Association. In Pointe-Claire, pursuant to Bylaw 90, Montréal's clean air bylaw (*Règlement 90 sur l'assainissement de l'air*), open fires and the use of outdoor wood-burning stoves or fireplaces are prohibited, and violators face fines of up to $1000. Bylaw 90 is in force in all 82 municipalities of the Montréal Metropolitan Community.

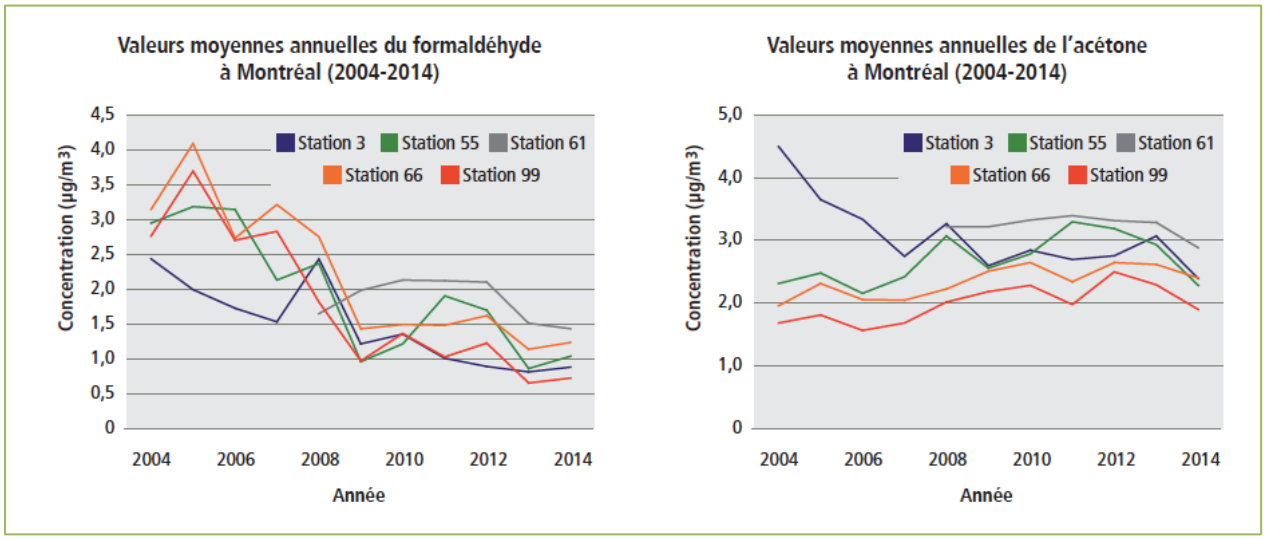
Other sources of air pollution

The City of Montréal has identified two other sources of air pollution affecting air quality and public health: volatile organic compounds (VOCs) and industrial pollution. In an urban environment, VOCs are in the air everywhere because they are used in a multitude of products: paints, solvents, insecticides, cosmetics, detergents, and so on. The International Agency for Research on Cancer (IARC) created a list classifying some of these products according to how carcinogenic they are. For example, formaldehyde is classified in Group 1 ("carcinogenic to humans"). Acetone is not classified by the IARC but, like formaldehyde, it is considered an irritant and is corrosive to the skin and eyes. The following figures show the changes in formaldehyde[6] and

[6] "Automobile non-catalyzed exhaust fumes are the greatest anthropogenic (man-made) source of formaldehyde" (Ville de Montréal 2015c, 7).

acetone[7] concentrations between 2004 and 2014 for the Dorval (66) and Sainte-Anne-de-Bellevue (99) stations (Ville de Montréal 2015c, 8).

Figure 5. Changes in formaldehyde and acetone concentrations (2004–2014)



Source: Ville de Montréal 2015c, 8

Industrial emissions also have an impact on air quality. Since the early 1970s, the City of Montréal's industrial waste control division (*Division du contrôle des rejets industriels*) has been monitoring and regulating those industries likely to emit particles into the atmosphere, pursuant to Bylaw 2001-10 respecting atmospheric emissions. In addition, industries are required to report their atmospheric emissions (Ville de Montréal 2015c). The City of Pointe-Claire has a directory of industries and businesses located within its territory (Ville de Pointe-Claire 2016c). The directory indicates the location, type of organization (commercial, public or industrial) and whether the entity owns or leases the premises. Also, through its Zoning Bylaw (PC-2775), the City prohibits "chemical industries with outdoor facilities...whose principal activity consists of producing, storing or distributing significant quantities of industrial chemicals" (Ville de Pointe-Claire 2015c, 3).

Recommendations

- Track emissions of the most polluting industries in the city.
- Incorporate sustainable development criteria into municipal activities, particularly for cleaning products.
- Raise public awareness about air quality issues.

Regreening

In addition to capturing CO_2, trees purify the air and absorb a number of contaminants from the atmosphere through their stomata. For example, they capture cadmium, chromium, nickel, lead, ozone and dust (MDDELCC n.d.a). Thus, through its tree planting and reforestation efforts, the City of Pointe-Claire is simultaneously improving air quality and the quality of life of its citizens.

The protection and standardized planting of trees has been incorporated into regulatory provisions. Below are a few highlights from Zoning Bylaw PC-2775 (Ville de Pointe-Claire 2015c):

- All trees must be preserved and maintained.

[7] "Acetone is used as a solvent in chemical and petrochemical plants and is one of the key intermediates used in the synthesis of many materials and polymers" (Ville de Montréal 2015c, 8).

- It is prohibited to fell a tree without authorization.
- There must always be at least one tree in the front yard of any landsite.
- Any felled tree with a diameter of 4 inches or more must be replaced within one year and in accordance with the established conditions.

In its Strategy to Fight the Emerald Ash Borer (2015), the City plans to save more than two-thirds of ash trees on public land and is committed to replacing every one of the 2,600 ash trees to be felled on public streets and in public parks by 2022 in order to maintain the tree canopy and protect its biodiversity. The City will also plant another 80 trees per year in addition to the ones it loses (Ville de Pointe-Claire 2015d).

Furthermore, the City of Pointe-Claire has reinstituted its tree distribution program for private property owners (Ville de Pointe-Claire 2015d). Thus, for Earth Day 2016, 575 trees of 12 different native species were distributed free of charge (Ville de Pointe-Claire 2016d).

To address the issue of heat islands, Pointe-Claire is promoting the development of sustainable green spaces on the roofs of its public buildings. The City completed an initial 1,500-sq.-ft. project on part of the roof of the Public Works building. Based on that experience, a second, 800-sq.-ft. section was developed in October 2009, and a third, 1,747-sq.-ft. section in 2011. The installation of green roofs improves air quality and increases rainwater retention (Conseil de la ville de Pointe-Claire 2012, 11).

Many of the actions proposed in the 2015–2019 Climate Change Adaptation Plan will have positive impacts on the maintenance and/or expansion of greencover. Some of these actions include:

- Establishing bylaws regarding the percentage of green area for new builds, and the sustainable development of parking lots;
- Developing green walls;
- Annually increasing the canopy and developing shaded areas in parks;
- Selecting plants of diverse species suited to new climate conditions;
- Creating a teaching garden for monarchs;
- Distributing native tree species to property owners;
- Adequately irrigating plants during dry periods and replacing annuals with perennials and shrubs (Ville de Pointe-Claire 2015b).

Recommendations

- Implement greening projects to combat heat islands.
- Identify greening opportunities in the City of Pointe-Claire.

5.2.3. Soil

Contaminated soil

Industrial contamination

The MDDELCC (2016f) has received reports of 32 contaminated sites in Pointe-Claire since 1999. That list is not exhaustive and includes only those cases that have been reported. For most of those sites, their rehabilitation is complete or meets the appropriate soil contamination level for their use (e.g. industrial use). Three have yet to be rehabilitated (see table below) (MDDELCC 2016f).

Table 6: Contaminated sites not yet rehabilitated in the City of Pointe-Claire

Name and Case Number	Address	Water and Soil Contaminant	Case Opening Date or Update
Pointe-Claire train station (CN Railway)	Across from Terra-Cotta Avenue	C10 to C50 petroleum hydrocarbons	2001-11-21
339 Chemin Bord-du-Lac-Lakeshore, Pointe-Claire (5728)	339 Bord-du-Lac-Lakeshore	Ethylbenzene and C10 to C50 petroleum hydrocarbons	2003-09-02
Reliance Power Equipment Ltd. (2957) and (10304)	85 Hymus Blvd. and adjacent sites	Polychlorinated biphenyls (PCBs)	2016-01-28

Further to actions taken by the MDDELCC, the Hymus Boulevard site, contaminated with polychlorinated biphenyls (PCBs), and possibly some adjacent sites, are in the process of being rehabilitated by the company that owns it. The public is kept informed of the situation on a regular basis through information sessions and releases.

Management of waste snow

According to the MDDELCC, snow dumping has several impacts on health and the environment, particularly because waste snow contains a number of contaminants, such as chromium, iron, manganese, lead, chlorides, oils, greases, suspended solids and debris (MDDELCC 2002c). When snow is dumped near waterways, it can visibly degrade the waterways and shoreline and pose risks for aquatic activities. Finally, the storage and intensive or general use of road salts near sensitive areas (wetlands, threatened species, forests, parks, etc.) can adversely affect soil properties, roadside vegetation, wildlife, and the quality of surface and groundwater (Environment and Climate Change Canada 2013b). In Quebec, approximately 1.5 million tonnes of road salts are used every year (MTQ 2010, 1). Municipalities have a role to play in applying, transporting, storing and optimizing the use of ice melters and minimizing their environmental impact. Quebec has a *Regulation respecting Snow Elimination Sites* for municipalities that conduct snow removal operations (MDDELCC 2016g). In addition, the MDDELCC Contaminated Sites Rehabilitation Policy states that special attention must be paid to sites used for waste snow elimination because this activity is likely to contaminate the soil (MDDELCC 2016g).

Pointe-Claire disposes of an estimated average of 120,000 m^3 of waste snow and has a maximum storage capacity of 189,000 m^3. To limit the impact of waste snow, the City samples the wastewater and cleans out sediments from the settling pond.

Recommendations

- Ensure compliance with provincial standards for waste snow collection and management.
- Monitor soil decontamination efforts.

Pesticides and herbicides

Pesticides and herbicides are primarily used to control insect pests, fungal diseases, certain bacteria, rodents, weeds, and so on. They are mainly used in agriculture, horticulture and groundskeeping, for extermination purposes and in the industrial sector (MSSS 2013). Quebec's Pesticides Management Code, in force since 2003, regulates the use and sale of pesticides through standards designed to limit their use (MDDELCC 2011a). Such products can have a major impact on health as well as the environment, by contaminating the water, air, soil and food. Every year in Quebec, nearly 1,500 cases of acute pesticide-related poisoning are reported. Acute poisoning involves short-term effects that arise soon after exposure. Pesticides also have suspected as well as proven long-term effects, such as cancer, genetic damage, certain reproductive and developmental disorders, and adverse effects on the immune, endocrine and nervous systems (MSSS 2013).

The City of Pointe-Claire restricts pesticide use by applying City of Montréal Bylaw 04-041 with the aim of reducing the health and environmental risks (Ville de Pointe-Claire 2015e). Pesticide use is prohibited, except in the following cases:

1. If it is a biological control agent, as designated by the Pest Management Regulatory Agency (PMRA), mineral oil or active ingredients authorized under schedule II to the Pesticides Management Code (2003, 135 G.O. II, 1653);
2. In pools and decorative ponds or self-contained artificial basins;
3. For the maintenance of golf courses and bowling greens, and on a property used for horticultural purposes.

A temporary permit may also be issued in the following situations:

1. For an infestation, unless it is in a sensitive area, such as a child care centre, school, health and social services institution, place of worship, residence for senior citizens, municipal park playground, or sports field used by children under 14;
2. Within a five-metre radius of warehouses and plants of food companies, to ensure vermin control;
3. Around and on the door and window frames of a building, for spider control;
4. On the base of a building and on a 30-cm strip around it, for ant control.

To limit contamination, certain conditions regarding the application of these products must be met, such as specific times, certain weather conditions, and the posting of a notice 48 to 72 hours in advance. The presence of waterways and the slope of the ground also affect the limits to be respected; specifically, pesticides are to be applied more than three metres from a water course or water body when the ground slope is less than 30%, and more than 15 metres when the ground slope is 30% or greater (Ville de Pointe-Claire 2015e).

Currently, under the Strategy to Fight the Emerald Ash Borer, pesticides approved or registered by a Government of Canada agency may be used for the sole purpose of combatting the emerald ash borer (Ville de Pointe-Claire 2015d).

Recommendations

- Develop a bylaw to protect insect pollinators.
- Raise public awareness about pesticide-related issues.

Soil erosion

Erosion is the wearing away of land along the shores of a waterway under the effects of wind, water and/or gravity. These soils are transported by currents in the form of fine particles and deposited downstream (Environment and Climate Change Canada 2010). This is a natural process. However, some human activities, such as the construction of buildings, roads and other infrastructures, can also induce or accelerate erosion and sedimentation.

The City of Pointe-Claire owns 6.5 kilometres of shoreline on the eastern part of Lake Saint-Louis. Through a waterfront acquisition program, Pointe-Claire aims to open up access to the lake and to the natural environment of its shores (Ville de Montréal 2002). The City therefore has a responsibility to maintain the health of this ecosystem. The City awarded a contract for

an environmental impact assessment to be conducted on the stabilization of Lake Saint-Louis shoreline in Pointe-Claire (SEAO 2016). The assessment will be used to develop an action plan for shoreline management and protection.

The City also protects its waterways through its Zoning Bylaw and the MDDELCC Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains. In particular, "any construction, any structure [and] any work" is prohibited on the "shores and riverbeds of waterways" (Ville de Pointe-Claire 2015c, 3). Some exceptions apply, such as the "maintenance, repair and demolition of existing constructions or structures used for residential purposes; municipal undertakings or structures used as public access points; shore restoration projects and projects for the restoration of a permanent and sustainable vegetation cover," and so on. Additional exceptions apply when the shores in question are not those of Lake Saint-Louis (Ville de Pointe-Claire 2015c, 3).

Recommendations

- Continue implementing actions to minimize the risk of soil erosion.

5.2.4. Municipal management

Quebec legislative measures and municipal responsibilities

As part of its Sustainable Development Plan, the Government of Québec enacted the *Sustainable Development Act* on April 19, 2006 (Gouvernement du Québec 2016; Gouvernement du Québec 2015; Gouvernement du Québec 2007), fostering a transition towards an economy that is more respectful of the environment and society.

The MAMOT and the MDDELCC encourage municipalities to take an integrated approach to sustainable development. By virtue of their responsibilities in the areas of land-use planning and local economic development, municipalities play a major role in the pursuit of sustainable development (Gouvernement du Québec 2015, 59).

Organizational structure

In 2016, the City of Pointe-Claire had 1,275 employees, including 461 contractors. Day-to-day management is carried out by the City Manager, Administrative Services, Legal Affairs and City Clerk, and Communications. The Engineering and Buildings department, Public Works, the Planning department, and the Culture, Sports, Leisure and Community Development department carry out the development and land-use planning work and provide services to the public.

The City owns 35 buildings within its territory (Ville de Pointe-Claire 2012b).

To monitor environmental quality issues, the City created an Environment and Sustainable Development division within the Public Works department (Ville de Pointe-Claire 2016h). The systemic scope of any environmental measure (public space planning, road infrastructure improvement, public awareness raising, etc.) involves all municipal services. The pooling of staff knowledge and expertise in highly diversified fields helps create a holistic view of environmental issues. Involving the departments in a sustainable development approach enhances the synergy of actions taken.

2015–2019 Strategic Plan

The City of Pointe-Claire's 2015–2019 Strategic Plan provides broad guidelines for its future actions. It identifies the City's strengths and assets and aims to "strengthen the organization's commitment to environmental responsibility" as well as outline priority actions, including the adoption of a sustainable development policy.

> "Council intends to maintain and emphasize the environmentally responsible status of the City's administration in all circumstances. Parks, green spaces, trees and shoreline are considered essential

elements of Pointe-Claire's quality of life. Council also expects to develop a residual materials management model that will meet the highest standards in terms of respect for the environment" (Ville de Pointe-Claire n.d., 12).

This initiative is a significant advancement. It provides for the structuring and formalization of sustainable development objectives and the City Manager's vision, while also incorporating the actions that are already being taken. The City is already carrying out a number of environmental initiatives within its departments, such as the implementation of a scheduling management process, the installation of GPSs to reduce GHG emissions on municipal vehicles, and the application of the 4 Rs[8] in waste management (WM). Other examples include actions to reduce paper use and encourage the repair, reuse and recovery of resources (computer hardware, telephones, CDs from the library).

With a view to developing its cultural, ecological and economic potential, the City's various departments have developed strategic visions, namely the Planning Program (2015), the Village of Pointe-Claire Special Planning Program (2016), the *Plan directeur du réseau cyclable* [bicycle network master plan] (2015), the Climate Change Adaptation Plan (2015), and the *Réflexion stratégique sur la mise en valeur du patrimoine bâti* [strategic analysis of the enhancement of our built heritage] (2015). By incorporating the observations and recommendations made in those documents, the City will improve its environmental performance and have a positive impact on the quality of life of its citizens.

Recommendations

- Prepare and adapt the organization for new environmental and sustainable development regulations to come.
- Ensure that municipal departments incorporate environmental management considerations, in accordance with the City's strategic directions.
- Encourage citizens and local associations to get involved in environmental actions.

5.2.5. Biodiversity

Through the presence and enhancement of its numerous public and natural green spaces, which are rich in a variety of plant and wildlife species, the City of Pointe-Claire is helping to conserve biodiversity in the metropolitan area.

Wooded areas

The Montréal Urban Agglomeration intends to increase its canopy index to 25% by 2025 and is encouraging municipalities to do the same. "The canopy is defined as the upper layer of a tree. It serves a number of ecological purposes by providing shade and absorbing dust and air pollution" (Ville de Pointe-Claire 2015d, 6). According to the City of Montréal, the 2011 canopy index for the urban agglomeration was 20.3%, while for Pointe-Claire it was 23.5% (Ville de Pointe-Claire 2015d, 6).

Pointe-Claire has 21 green spaces and 14 large parks, many of which are on the river. Terra-Cotta Natural Park is about 116 acres in size and has six kilometres of developed trails. These spaces make up about 10% of the city (Ville de Pointe-Claire 2015e). In total, the city has 21,491 trees of 150 different species (Ville de Montréal 2002, 12).

In addition to the City's bylaws, public awareness initiatives and Climate Change Adaptation Plan, Pointe-Claire's SPAIP Bylaw also contains specific provisions to preserve biodiversity and protect and expand its wooded areas. For example, parking lot redevelopments "should result in an increase in green space area or in quality, and not the opposite" and site planning and architectural integration programs should be approved based on their ability to "protect and enhance the best components of the existing woods" (Ville de Pointe-Claire 2016f, 51 and 59).

To preserve the urban forest's biodiversity when replacing ash trees infested by the emerald ash borer, the City applies the diversity principle to determine the most appropriate species based on environmental conditions (Ville de Pointe-Claire 2015b; Ville de Pointe-Claire 2015d).

[8] Reduce, reuse, recycle and recover.

The City is also restoring four hectares of urban woods in Terra-Cotta park by planting 2,400 plants (2016-2017) and making improvements to three kilometres of trails (Ville de Pointe-Claire 2016e), in collaboration with Canadian National (CN) Railway's EcoConnexions program.

In 2016, the City also signed a funding and conservation agreement with the Fondation Hydro-Québec pour l'environnement [Hydro-Québec foundation for the environment] and Nature-Action Québec to highlight Terra-Cotta Natural Park as a recreation and tourist destination over the next 25 years. The project involves investments of over $165,000 to develop formal means of accessing the park, limit harmful means, mark trails, organize community planting days, install welcome signs and interpretation panels, clear out buckthorn shrubs and make certain wildlife-related improvements.

Flora and fauna

As it is located on an island surrounded by the St. Lawrence River, Pointe-Claire is naturally host to numerous plant and animal species. A 2012-2013 inventory of Terra-Cotta Park identified 221 plant species (37 tree species, 37 shrub species and 147 herbaceous plant species) and 65 wild vertebrate species (2 reptile, 53 bird and 10 mammal) (Ville de Pointe-Claire 2012f).

According to the Government of Québec, Montréal is home to more than 60 species at risk. "They are located primarily in the city's large parks, but also elsewhere in the various land and aquatic habitats and along shorelines" (Ville de Montréal 2013d, 12). In Terra-Cotta Park, three plant species (the shagbark hickory, the butternut, and the white trillium) and two wildlife species (DeKay's brownsnake and the silver-haired bat) are on the list of potentially threatened or vulnerable species in Quebec. One bird species (the eastern wood-pewee) is also on Canada's Species at Risk Public Registry (Ville de Pointe-Claire 2012f). Based on these observations, a master plan was developed to preserve the ecological value of Terra-Cotta Park. In 2012, in partnership with Éco-Pointe-Claire, a local colonization pilot project for the purple martin was implemented in Maples Park. The project created 48 habitats for this migratory bird and revitalized the shores of Lake Saint-Louis (Conseil de la ville de Pointe-Claire 2012, 17).

Alien and invasive species

Emerald ash borer

The emerald ash borer was detected in Montréal in 2008. This insect can infest and kill an ash tree in a span of five to seven years and can affect entire ecosystems (McCullough and Katovich 2004, in Ville de Pointe-Claire 2015d). Pointe-Claire has some 8,000 ash trees, about 50% of which are on public land (Ville de Pointe-Claire 2015d). The City is taking a proactive approach in the fight against the emerald ash borer. Since 2012, detection tests (trapping and bark removal) have helped identify two areas of infestation affecting 31 trees, most located in the industrial sector. The City has an inventory of ash trees on public land, and an inventory of ash trees on private land is currently being developed. The City has been treating public ash trees since 2014 and aims to treat 35% of them every two years until 2022, when it will review its intervention strategy (Ville de Pointe-Claire 2015d). The felling of untreatable ash trees on public land will be conducted over eight years. Approximately 325 ash trees will be felled every year until 2022 (Ville de Pointe-Claire 2015d).

As for ash trees on private land, the City has taken numerous steps to raise property owners' awareness (information and pamphlet dissemination, information sessions, etc.) regarding preventive and corrective measures that can be taken and how to detect the insect (Ville de Pointe-Claire 2012g). Two options are available: preventive treatment through the injection of an insecticide called TreeAzin, or the felling of infested trees 25 centimetres or larger in diameter (program in effect until 2019). Subsidies are available. In 2015, 10% of ash trees on private land were treated by the owners.

The Bylaw regarding the Fight Against the Spread of the Emerald Ash Borer (PC-2838), passed in 2014, establishes:

- the prohibition on planting new ash trees;
- the use of certain pesticides for treatment;

- the requirement of prior authorization to fell and replace an ash tree greater than 10 centimetres in diameter;
- rules for managing ash tree materials (Ville de Pointe-Claire 2015d).

Other invasive species

The City of Pointe-Claire is equipping its citizens to counter the impacts of certain nuisance species like ragweed, and invasive species like wild parsnip, Japanese knotweed, white grub, buckthorn and giant hogweed. Specifically, the City is providing information on how to identify these species, posting and issuing warnings, organizing workshops and implementing innovative projects, such as creating brown-bat houses to combat the white grub.

Wetlands

Wetlands are defined as sites saturated with water or flooded for long enough periods as to influence the nature of the soil and the composition of the vegetation. They include a wide range of ecosystems, such as ponds, marshes, swamps and bogs (Couillard and Grondin 1992, in Joly et al. 2008, 52). Wetlands act as a sponge, helping limit the risks of flooding and drought and providing a steady flow into waterways. They act as natural filters and limit the adverse effects of excessive nutrient loads. By conserving wetlands, we can prevent the need for pollution cleanup measures. Wetlands contribute to groundwater recharge and absorb greenhouse gases. Wetlands are also rich in animal life. In that vein, pursuant to section 22 of the EQA, the MDDELCC can require a land owner to implement measures for the restoration, creation, protection or ecological reclamation of a wetland, body of water or land site (MDDELCC 2002d).

Wetlands make up approximately 10% of Quebec's land area and, despite their benefits, they continue to decrease in size. For example, since colonization, 80% of the area of St. Lawrence wetlands has disappeared (Environment and Climate Change Canada 2013a). Wetlands are also affected by invasive plant species. Locally, 50% of wetlands located between Lake Saint-Louis and Lake Saint-Pierre are reportedly affected by six of these invasive species (FAQDD 2010). Invasion by certain alien plants is reportedly the second cause of biodiversity loss, after habitat destruction (COBAMIL 2011, 11). "Invasive alien plants produce a significant change in terms of ecosystem composition, structure or processes. Once established, they can crowd out some native plants and disrupt the habitat's ecology, thereby also affecting the fauna that depends on them for food or reproduction" (Ville de Montréal 2013d, 16).

In 2007, Canards illimités (Ducks Unlimited) Canada and the MDDELCC produced a map of CMM wetlands. The results show 11,250 wetlands covering a total area of 20,971 hectares (including fluvial wetlands), or 4.7% of CMM territory. Their average size is 1.9 ha, and most are swamps (Canards illimités 2010, 4). In its SPAIP and its Zoning Bylaw, the City promotes wetland conservation.

Recommendations

- Combat invasive species.
- Identify and protect threatened and vulnerable species.

5.2.6. Quality of life

Quality of life is a distinctive feature of Pointe-Claire. "The city's identity encompasses its municipal, institutional and commercial services, the expanse of its urban forest, Lake Saint-Louis, its network of parks, its residential neighbourhoods, the vitality of its community life, and its strategic location on the island of Montréal" (Ville de Pointe-Claire n.d., 5). Quality of life "is ensured by the combined efforts of the City and the many community organizations that support citizens' health and welfare. The range of available services is greatly enriched by the commitment of volunteers" (Ville de Pointe-Claire n.d., 8).

Quality of life can be altered by certain nuisances. The broader definition of a nuisance as something that causes an inconvenience or harm encompasses a variety of things, such as noise, dust, smoke, foul odours or even light pollution. Noise

and odour pollution as well as the presence of stinging nettle plants can be an inconvenience to residents, undermine local quality of life and represent costs for the community.

Noise and traffic

Some of Pointe-Claire's road infrastructures and industries are likely to have a significant noise impact. Highways 20 and 40 boost and concentrate industrial area traffic and development. In 2005, the Government of Québec conducted a study of Highway 20 noise pollution in Pointe-Claire. Its recommendations included adding noise-abatement walls along three sections in particular (MTQ 2005).

Measures to reduce noise pollution have been implemented, such as the installation of a green wall near Highway 20.

Visual and aesthetic pollution

The City of Pointe-Claire was one of the first incorporated towns on Montréal Island. It has a number of historical and heritage buildings governed by the Bylaw for Recognition of the Pointe-Claire Institutional Core as a Heritage Site. Through maintenance and improvement efforts, Pointe-Claire is beautifying the city.

Through numerous parks and building maintenance and improvement projects as well as implementation of the SPAIP and the Special Planning Program for the Village of Pointe-Claire and the program currently underway for the Village of Valois, the City is defining the rules for high-quality urban planning.

Actions for citizens' well-being

Events and activities

The City of Pointe-Claire organizes various activities and events for its residents. Specific measures are taken to reduce their environmental impact.

- Incorporation of recycling and composting into requests for outside events
- "Zéro Déchet" [no waste] day camp
- Use of compostable tableware at all events
- Water bottle refill stations
- Sale of reusable bottles

The City also supports local associations and organizations through assistance programs providing low- or no-cost venue rentals for special events or activities, and through specific subsidies (Ville de Montréal 2002, 10).

Recommendation

- Implement environmental actions for the well-being of the public.

5.2.7. Waste management

In 2011, the Government of Québec revised its Residual Materials Management Policy and established a 2011–2015 Action Plan (MDDELCC 2016i; MDDELCC n.d.b). This plan establishes certain objectives, including to reduce the quantity of waste sent for disposal to 700 kilograms per capita; recover 70% of recyclable materials and construction, renovation and demolition waste and 60% of organic waste; and recycle or reclaim 80% of concrete, brick and asphalt waste (MDDELCC n.d.b; MDDELCC 2011b) as well as eliminate all organic waste from landfills by 2020 (MDDELCC 2011b; Ville de Montréal 2013b, 49).

In 2014, the City of Pointe-Claire generated 16,952 tonnes of waste, all categories included. The following table shows the WM quantities produced in Pointe-Claire and the Urban Agglomeration (Ville de Montréal 2015d, 38–44). Within the Urban Agglomeration, only the cities of Pointe-Claire and Senneville reached the government target of 70% recovery of recyclable materials. Pointe-Claire is developing its approach for organic waste, in order to meet the government objective of 60% recovery.

Table 7: 2014 Waste management summary

Individual generation			
	Household waste (kg/person/year)	Recyclables (kg/person/year)	Organic waste (kg/person/year)
Montréal Urban Agglomeration	278	87	26
Pointe-Claire	257	126	107
Recyclables			
	Quantity (tonnes)	Recovery rate (%)[9]	Recovery rate (kg/person/year)
Montréal Urban Agglomeration	169,179	58	87
Pointe-Claire	3,924	70	126
Organic waste			
	Quantity (tonnes)	Recovery rate (%)	Recovery rate (kg/person/year)
Montréal Urban Agglomeration	50,768	14	26
Pointe-Claire	3,319	41	107
Residential construction, renovation and demolition waste			
		Ecocentres and collection sites (tonnes)	Recovery rate (%)
Montréal Urban Agglomeration		136,386	60
Pointe-Claire		1,400	61
Household hazardous waste (HHW)			
		Quantity (tonnes)	Recovery rate (%)

[9] The CMM's method of calculating recovery rates factors in the total waste generated by Urban Agglomeration citizens by adding the quantities collected by municipal services to the quantities recovered upstream by citizens (e.g. bottle returns, backyard composting, grasscycling). It also factors in the recovery potential, meaning the percentage of waste that could be recovered in order to be reclaimed compared to the total quantity of generated waste (CMM n.d., in Ville de Montréal 2015d, 51).

Montréal Urban Agglomeration	3,352	59
Pointe-Claire	64	65

Source: (Ville de Montréal 2015d, 38–44)

Regular municipal waste collection

Recyclables and compost are collected weekly. The City of Pointe-Claire accepts food scraps and yard waste (evergreen branches, leaves, sawdust, grass clippings (without pesticides)). In addition to providing rolling bins for recycling and composting, it also offers free kitchen cones for managing household food scraps. All of these organic materials are taken to the Mironor compost site in Brownsburg-Chatham. Household waste is collected every other week and, for multi-unit buildings, every week. Every year the City produces a Waste Collection Guide, available on its website (Ville de Pointe-Claire 2016g).

Periodic municipal waste collection

In January, Christmas trees are collected for composting or chipping. Also, three or four times a year, in summer, the City collects bulky items; these collection days are indicated in the Waste Collection Guide and on the City website. Other items, such as mattresses, sofas, tires, appliances containing refrigerants, and construction materials, must be brought to the ecocentre (Ville de Pointe-Claire 2012h). Also, for a fee, the City offers a special pickup service for construction, renovation and excavation materials.

Collection point for special materials

The City provides residents with options for disposing of certain items and materials. A household hazardous waste (HHW) depot is held four times a year in the City Hall parking lot, to prevent contaminants from ending up in the environment (Ville de Pointe-Claire 2012h). Since January 2016, a permanent three-lane drop-off centre has been open for recycling expanded and extruded polystyrene and number 6 plastic. It is located in the Public Works parking lot at 50 Terra-Cotta Avenue.

Ecocentre management

Six times a year, the City gives residents the opportunity to drop off ecocentre items in the Public Works yard (Ville de Pointe-Claire 2016g). Residents can also drop off such items at any time at the Montréal Agglomeration's Saint-Laurent Ecocentre.

Recommendations

- Improve environmental performance in the area of waste collection.
- Raise public awareness about waste management.
- Develop a waste reduction strategy.

6. Issue summary

The following table summarizes all the issues identified based on the Pointe-Claire environmental assessment.

Table 8: Summary of issues identified from the environmental assessment

Sector	Subsector	Key Issues / Recommendations
Water	Drinking water	● Continue with efforts to protect Lake Saint-Louis water quality. ● Raise public awareness about reducing drinking water consumption. ● Promote rainwater collection (City and residents).
	Groundwater	● Catalogue groundwater sources. ● Identify industries likely to contaminate soil and water.
	Surface water	● Promote the City of Pointe-Claire's involvement in the protection of Lake Saint-Louis through collaborative bodies such as the Ville-Marie ZIP committee, the regional round table and the Greater Montréal round table. ● Promote collaboration between Lake Saint-Louis shoreline municipalities. ● Keep the public regularly informed about Lake Saint-Louis water quality. ● Raise public awareness about Lake Saint-Louis and St. Lawrence River issues.
	Domestic wastewater	● Ensure sound management of domestic wastewater by implementing the Climate Change Adaptation Plan. Continue to implement the measures currently being taken.
Air	Combatting climate change	● Determine whether any industries affected by the new provincial regulation are operating in the city. ● Adopt a series of actions to reduce GHG emissions from municipal activities. ● Implement the Climate Change Adaptation Plan.
	Transportation and sustainable mobility	● Work with local associations to achieve the City's sustainable mobility objectives. ● Support the implementation of actions to increase the use of sustainable transportation. ● Raise public awareness about sustainable transportation through action programs.
	Air quality	● Track emissions of the most polluting industries in the city. ● Incorporate sustainable criteria into municipal activities. ● Raise public awareness about air quality issues.
	Regreening	● Implement greening projects to combat heat islands. ● Identify greening opportunities.
Soil	Soil contamination	● Establish an ecological approach to waste snow management. ● Ensure compliance with provincial standards for waste snow collection and management. ● Take action for strict monitoring and decontamination of at-risk soil.
	Pesticides and herbicides	● Take a proactive approach to pesticide issues and go beyond the provincial regulatory framework. ● Raise public awareness about pesticide-related issues.
	Soil erosion	● Continue implementing actions to minimize the risk of soil erosion.

Municipal management	Formal internal initiatives	● Prepare and adapt the organization for new environmental and sustainable development regulations to come. ● Ensure that municipal departments incorporate environmental management considerations, in accordance with the City's strategic directions. ● Encourage citizens and local associations to get involved in environmental actions.
Biodiversity	Woods / flora and fauna / invasive species / wetlands	● Promote the expansion of wooded areas and the maintenance of biodiversity. ● Combat invasive species. ● Promote the coexistence of natural and human environments through urban planning bylaws. ● Identify threatened and vulnerable species.
Quality of life	Nuisances	● Implement ecological remediation solutions, i.e. natural nuisance reduction methods. ● Continue carrying out activities designed to enhance the well-being of citizens using a sustainable development approach.
Waste	Municipal waste collection / ecocentre management	● Identify possible actions for improving environmental performance in the area of waste collection. ● Raise public awareness based on the new Québec Residual Materials Management Policy.

7. Targeted areas of intervention

Based on the environmental assessment, the City has established objectives to address priority issues and take the corresponding action. The proposed objectives will serve as guidelines to improve the quality of the environment.

Sector 1: Water

Objective 1: Continue with the City's efforts to reduce water consumption

The City of Pointe-Claire is already implementing several initiatives to conserve drinking water. Additional actions may be considered to pursue these initiatives further.

Objective 2: Limit the impact of runoff and wastewater

In its Climate Change Adaptation Plan, the City sets out a number of actions to better manage runoff and wastewater. These actions must be able to be incorporated into the Sustainable Development Policy and must be accompanied by complementary actions.

Sector 2: Air

Objective 3: Continue with the City's actions to fight climate change

The City of Pointe-Claire is already involved in the fight against climate change, through Agglomeration-wide initiatives and the Climate Change Adaptation Plan. In addition to these efforts, complementary actions may be considered, such as the implementation of eco-efficient measures that could pay for themselves through future savings.

Objective 4: Preserve local air quality

Through various measures, the City wants to encourage the community to reduce its emissions of greenhouse gases and other pollutants, such as particulate matter.

Objective 5: Promote actions that improve active and sustainable transportation in the community

The City is already working toward more sustainable transportation by putting new infrastructures in place. Complementary structured actions may be considered in collaboration with local and provincial stakeholders to go even further.

Sector 3: Soil

Objective 6: Conserve soil quality through monitoring and corrective actions

Actions taken by the City must be able to limit the risk of soil contamination by hydrocarbons, pesticides, herbicides, waste snow and other harmful substances for the environment.

Objective 7: Promote soil use from a sustainable development perspective

By changing how we think, we can better prevent certain environmental risks, specifically through systematic greening actions and by adapting certain bylaws.

Sector 4: Internal management of municipal affairs

Objective 8: Incorporate an environmental management system

In addition to acting in different environmental sectors, the City must be able to develop formal initiatives and have the necessary tools to be able to incorporate environmental considerations into its day-to-day management activities. This can be achieved by fostering an environmental culture within each department.

Objective 9: Facilitate application and monitoring of the sustainable development policy process

The success of the Sustainable Development Policy also depends on the City's ability to develop suitable processes and secure adequate technical and human resources.

Objective 10: Develop a responsible procurement policy

The City can have a positive impact on the environment by encouraging sustainable actions. It will therefore support the purchase of local goods and services produced in an environmentally friendly manner.

Objective 11: Work with local actors to improve the quality of the environment

The success of the Sustainable Development Policy depends heavily on the quality of the relations that the City establishes with local actors in order to incorporate them in the best possible manner.

Sector 5: Waste management

Objective 12: Deploy ongoing actions to improve waste management

The City is taking actions to meet provincial waste management targets. It will be able to go even further by implementing additional actions.

Objective 13: Develop actions to raise public awareness about waste-related issues

Awareness is the key to promoting sustainable actions for the long-term improvement of performance in the area of waste management.

Sector 6: Biodiversity

Objective 14: Expand wooded areas

Although the city is highly urbanized, it must conserve and expand its wooded areas, not only for the well-being of its citizens but also to ensure the survival of its biodiversity.

Sector 7: Quality of life

Objective 15: Implement environmental actions for the well-being of the public

Quality of life is one of Pointe-Claire's key strengths. By taking future generations into consideration from the outset of every project and combining those considerations with the Sustainable Development Policy, Pointe-Claire is ensuring the City's sustainable development and enhancing the well-being of present and future generations.

Objective 16: Identify and combat nuisances using ecological solutions

Nuisances like ragweed can adversely affect quality of life. The City can prevent such problems by implementing ecological solutions.

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