

May 2010

The Management of Water Services in Montreal

Main Conclusions

- The city of Montreal's water infrastructure is in an advanced state of disrepair after years of neglect. The city loses 40 percent of its water each year because of leaks and breaks in the water pipes. Sixty-seven percent of the system of water lines will have reached the end of its useful lifespan within 20 years; 33 percent has already done so. Moreover, water treatment plants must be upgraded to comply with provincial drinking water quality regulations.
- The renovation and modernization of the network will require Montreal to spend \$4 billion, or \$200 million per year on average, over 20 years, to upgrade the existing system.
- The conventional method for finding such a sum of money has been to raise taxes, increase water tariffs, and depend on contributions from other levels of government—in short, to rely upon the very body that created the problem to solve it, without addressing the root cause of the problem. However there are funding alternatives that are grounded in sound economics, such as a pricing system that would reflect the actual costs of water services and/or private sector participation in water management.
- Proper water pricing would account for all of the costs involved in treating and delivering fresh water to consumers. It would ensure the capital required to repair and upgrade water infrastructure and treatment plants is available, as well as provide an incentive to conserve water. The participation of the private sector under the “French” model of water management in Montreal would offer new sources of capital and improve efficiency in service delivery as a result of the competitive environment.



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Introduction

During the winter of 2009, hundred-year-old water pipes gave way during a cold snap, causing flooding in the streets of Montreal. In July 2009, citizens of Rosemont, whose basements had been flooded earlier in the summer, asked the Superior Court of Quebec for permission to file a class action suit against the city of Montreal (Noel, 2009c). At the end of August, a storm sewer dating back to 1866 collapsed under Peel Street, temporarily blocking traffic in the heart of downtown. These incidents illustrate the severity of the problem with the city's aging water infrastructure (Clément, 2009b).

There were 135 water pipe breaks in Montreal in 2009, up significantly from 102 the previous year (Clément, 2009a). According to the city's former Director General Claude Léger, 40 percent of the system's water is lost each year in the city because of leaks and breaks in the water pipes (Champagne, 2009b; Ville de Montréal, 2009c). This is a loss of 800,000 cubic metres a day. To put this volume into perspective, the total daily consumption of the city of Paris (2.2 million people) is 550,000 cubic metres a day (Eau de Paris, 2010). Montreal diagnosed its system's advanced state of deterioration back in 2002, and has known since then that its renovation and modernization will require a massive outlay of resources.

The problem Montreal faces is how to pay for the work. The conventional solution would see the city maintain its public monopoly over water management. In this context, the roughly \$4 billion required to

repair the water infrastructure and to upgrade the water treatment plants in the city over a period of 20 years (Ville de Montréal, 2006a: 89) would need to be paid by taxpayers through the municipal, provincial, and federal governments.

Yet with this solution, there is no guarantee that sufficient funds will be available or that infrastructure repairs will be made efficiently. This is why it makes sense to explore viable funding alternatives, such as the introduction of market mechanisms for the management of water services¹ in Montreal. This Fraser Alert presents two complementary and realistic options: 1) a pricing system that would reflect the actual costs of water services, and 2) asking the private sector to treat and distribute drinking water, and undertake the repairs and modernization of the infrastructure. Private sector involvement would likely control costs and help to ensure that the work is done efficiently and is of optimum quality.

Infrastructure modernization and how to finance it

Montreal's water infrastructure is in an advanced state of disrepair. A 2002 technical study commissioned by the city's executive committee² found that 67 percent of the system of water lines will have reached the end of its useful lifespan within 20 years, and 33 percent have already done so. Meanwhile, 25 percent of the sewage system will have reached the end of its useful lifespan within 20 years, and 3% has already done so (Ville de Montréal, 2006b: 3). Not only does a large proportion of

the water lines and sewer systems require repairs, but water treatment plants must be upgraded to comply with provincial regulations for drinking water quality.

The poor quality of the infrastructure is the result of years of neglect in the maintenance and repair of the water lines and sewer system. According to Marcel Boyer and his colleagues (Boyer et al., 1999: 26), the neglect is likely due to the fact that infrastructure lifecycles are usually much longer than the terms of elected officials. As a result, officials tend to ignore future problems and focus instead on those with an immediate political payoff. There is also the fact that such infrastructure is largely invisible to voters and, therefore, is often neglected by all levels of government until the problem becomes visible and unavoidable.

Apart from the 2002 technical study, Montreal also commissioned a financial study that same year to evaluate the fiscal impact of repairing and upgrading the infrastructure. This study was prepared by PricewaterhouseCoopers, and its conclusions were clear: "The city must undertake to repair this infrastructure without delay in order to keep costs from spiralling due to any additional degradation" (Ville de Montréal, 2005: 4.4). The costs the study mentions are related to the enormous volume of water (and sewage) lost to leaks and breaks, to the growing amount of compensation paid to homeowners whose properties are flooded, or to payments for emergency repair work, which is always more expensive than planned maintenance (Ville de Montréal, 2005: 4.1). According to

the study, Montreal will have to spend \$4 billion, or \$200 million per year on average, over a period of 20 years, to upgrade the existing system (Ville de Montréal, 2006a: 89).

How does Montreal intend to finance this amount?

So far, Montreal’s financial strategy has consisted of setting up a special “Fonds de l’eau,” or “water fund,” to amortize the costs of repairing aging facilities and restructuring water services over a 20-year period (Quebec, 2009a). Revenues for this special fund come partly from a new tax that has been added to residential and non-residential property taxes, and partly from an increase in water tariffs for industries, businesses, and institutions³ (Ville de Montréal, 2005: 4.7). As described in the table 1, the strategy, now implemented, consisted of an initial levy of \$25 million in 2004. That figure that has been (and will continue to be) increased by \$20 million annually, until 2013, by which time \$200 million annually is to be set aside in the water fund. After 2013, \$200 million annually will be added to the fund until 2023, when the fund is expected to total \$3.1 billion.

It will be difficult to keep up with the pace of the planned deposits to the fund. The decision has already been made that the 2010 budget will maintain the water fund contribution at the same level as in 2009 (\$125 million), whereas the plan calls for an increase in the contribution to \$145 million. Moreover, the contributions outlined in table 1 will not be sufficient to undertake

Table 1: Additional contributions for the improvement of water services

	Forecasted contribution (\$ millions)	Actual contribution (\$ millions)
2004	\$25	\$24.3
2005	\$45	\$42.8
2006	\$65	\$57.2
2007	\$85	\$89.2
2008	\$105	\$109
2009	\$125	\$125
2010	\$145	\$125
2011	\$165	
2012	\$185	
2013	\$200	
2014-2023	\$200 million/year	
Partial total:	\$3.1 billion	

Source: Ville de Montréal, 2007a: 81.

all the necessary repairs; the fund will only cover \$3 billion of the \$4 billion needed. The water fund will, therefore, also need contributions from federal and provincial governments. As City Hall officials put it, “... these efforts must be combined with negotiations for the financial participation of higher levels of government on the order of \$1 billion over the next 10 years” (Ville de Montréal, 2006a: 89). There is no guarantee, however, that these negotiations with the federal and provincial governments will bear fruit.

As noted, the financial requirements of repairing and modernizing the water lines and sewer system are enormous. The conventional solution has been to raise taxes, increase

water tariffs, and depend on contributions from other levels of government to secure the necessary funds. However, it would be instructive to consider alternatives grounded in sound economics, such as the true pricing of water and wastewater services and/or private sector participation in water management.

First Alternative: Pricing Water

Proper water pricing would account for all of the costs involved in treating and delivering water.

Currently, Montrealers are not directly billed for the water they use. Instead, a portion of their general property tax pays for water services.⁴ The problem with the current pricing system for water is that the water is priced at a fixed rate, independent of users’ actual consumption (Quebec, Groupe de travail sur la tarification des services publics, 2008: 108) and the cost of operating and maintaining the infrastructure. Such a system promotes waste, since the price is generally lower than the value of the resource (Boyer et al., 1996: 44), and users do not have information about the actual costs. As noted by Quebec’s Groupe de travail sur la tarification des services publics, water consumption is 74 percent greater, on average, in municipalities with flat-rate pricing than in those that calculate water bills based on the volume of consumption (Quebec, Groupe de travail sur la tarification des services publics, 2008: 108).

Even if water is regarded as a “right,” it is not free. In fact, the

provision and distribution of water and the treatment of wastewater is very expensive. In order to measure the full cost of treating and supplying water to Montrealers, the city will have to implement an accounting system to support marginal cost pricing (Deweese, 2002; Kitchen, 2006; Pierce et al., 1985; Renzetti, 2009). As Renzetti explains, marginal cost pricing would use price signals to let consumers know the real value of all of the inputs used to supply water (Renzetti, 2009: 16)

Rates are the most effective way of managing the demand for water because consumers respond to price signals (Water Strategy Expert Panel, 2005: 54). The only way to implement full-cost pricing that reflects marginal costs⁵ is to install individual meters for households and businesses that measure water use (Renzetti, 2009: 2). The price a household pays for water will thus increase or decrease according to the volume consumed (Renzetti, 2009: 8).

Full-cost accounting also is necessary because current pricing understates the full costs (capital, operating, and maintenance costs) of supply, which means that consumption is subsidized by taxpayers through municipal and provincial taxes, and federal grants (Renzetti, 2009: 11). Thus, consumers have little incentive to conserve water. According to Renzetti (2009: 8), a city like Montreal would need to revise its pricing procedures so that all the expenditures, including capital and regulatory costs, are reflected in water rates.

If such a reform is implemented, the water billing would combine a fee for operating and maintaining

infrastructure with a charge for water consumption, thereby reflecting both the fixed and variable costs of water service (Water Strategy Expert Panel, 2005: 61). Water bills should also include charges to maintain capital reserves for system modernization (Renzetti, 2009: 3).

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In 2007, Montreal had planned to install 30,500 water meters in industrial, commercial, and institutional buildings at a cost of \$106 million (Noel, 2009b) to assess the consumption of water in order to detect leaks and, ultimately, implement volume pricing for those who use very large quantities of water. According to the city, the residential sector accounts for 38 percent of consumption and industries, businesses, and institutions for 62 percent. However, 45 percent of the water system revenue is paid by residents, who are thus subsidizing the commercial and industrial sectors, from which 55 percent of the revenue is collected (Ville de Montréal, 2005: 4.8).

A controversy erupted in 2009, however, surrounding the December 2007 awarding of the water meter contract to the GÉNIEau

consortium set up by Simard-Beaudry and Dessau-Soprin (Champagne, 2009a; Duchesne, 2009; Lévesque, 2009). This contract was for the installation of meters in industrial, commercial, and institutional buildings, and to equip them with a communication system capable of transmitting each building's consumption to a central computer (Noel, 2009a). The goal was to detect leaks and to effect savings by reducing water pressure at night⁶ (Noel, 2009b). In July 2009, Mayor Gérald Tremblay asked the auditor general to scrutinize all aspects of the \$356 million contract,⁷ the largest contract ever granted by the city of Montreal. After receiving the auditor general's report, the mayor decided to cancel the water meter contract (Lessard, 2009). According to the *Gazette*, the report contained 58 findings related to overspending, administrative laxity, and poor communication in awarding the contract, which the city council approved unanimously and without debate in November 2007. The report also pointed to "close links" between unnamed city officials and "external partners" and evidence that meetings related to the contract were scheduled during the bidding process" (Gyulai, 2009).

All the controversy aside, the introduction of water meters will be necessary if full-cost pricing is to be instituted. The adoption of a universal metering system does not have to be as expensive as in the GÉNIEau contract, however. In Quebec City, which is also installing water meters in industrial, commercial, and institutional buildings, the meters will be sold to building owners for an estimated average price of

\$1,500, which also includes the management fee (Noel, 2009d).

As underlined by the Water Strategy Expert Panel (2005: 55), universal metering enables consumers to pay only for the amount of water they use and reminds them of the costs of use. The panel also mentions that metering helps to identify the location of leaks, which allows for better use of repair and maintenance resources and improves accountability (Water Strategy Expert Panel, 2005: 55)

The transition from a system in which the majority of users lack information about the actual price of water⁸ and the service provider does not know how much water ratepayers use, to one in which water is fully priced would not threaten anyone's access to water (Boyer et al., 1999: 8). Low-income households could receive compensation to help offset the costs. According to the OECD, policies that target vulnerable groups (notably through means-tested aid) have generally proven more efficient than universal subsidies (OCDE, 2008: 3).

Clearly, implementation of marginal cost pricing and the full-cost accounting needed to support it would ensure that the capital required to repair and upgrade water infrastructure and treatment plants is in place, as well as provide an incentive to conserve water.⁹

There exists another alternative that would free up financial resources for the renewal of the water infrastructure: allowing the private sector to play a role.

Second Alternative: Private Sector Participation in Water Management

Private sector water services can take the form either of regulated ownership or a concession-type contract awarded through competitive bidding. In the first case, the infrastructure is privatized, while in the second it remains public. Privatization is the “English” model, largely limited to England and Wales, whereas the second case, the concession type of contract, is the “French” model.

Privatization of water infrastructure dates back to 1989, when then-Prime Minister Margaret Thatcher instituted privatization of drinking water and sanitation under the Water Act, (Boyer et al., 2001: 10). At the time, the British water system was seriously underfunded; more than one quarter of treated water was wasted due to leaks in the pipeline network. In addition, about one-third of the drinking water exceeded prescribed limits for pesticides and iron, and almost a quarter exceeded limits for lead (Brubaker, 2003: 14).

The British government estimated at the time that a capital investment of £24 billion over a period of 10 years would be needed to repair the water delivery and treatment systems, and to bring them in line with European norms (Brubaker, 2003: 14). The decision was taken, therefore, to sell the assets of 10 regional public water and wastewater systems, while the network in Scotland remained under government control. Initially, the British government paid off the debts of the

government-run water services to attract private investors.

The government also introduced a system of regulation managed by Ofwat, (the Water Services Regulation Authority), which was empowered to ensure sufficient infrastructure investment as well as reasonable pricing and customer service. According to Marcel Boyer and his colleagues (2001: 11), such regulatory oversight protects consumers from abuse by government-sanctioned monopolies. Ofwat also is authorized to encourage competition in water management, a responsibility it shares with the Monopolies and Mergers Commission. Finally, Ofwat is charged with monitoring the efficiency of the private service providers (Boyer et al., 2001: 11). The quality of drinking water is supervised by the Drinking Water Inspectorate (DWI), which publishes an annual report on each water company and investigates cases of substandard water (Boyer et al., 2001: 10). Needless to say, this is a far cry from the caricature of privatization as corporate bullies taking advantage of unsuspecting citizens.

It is within this regulatory context that the privatized sector improved the quality of drinking water¹⁰ in the UK, investing the equivalent of £3.5 billion per year in the 1990s, compared to average annual capital outlays of £1.9 billion in the 1980s, prior to privatization (Brubaker, 2003: 15). The massive infrastructure investments did lead to increased water prices. The average household bill for water and sewage has risen by 21.3 percent in real terms since 1989. By 1999, however, Ofwat imposed rate reductions

on the order of 12 percent, on average (Brubaker, 2003: 17).

The practice of cutting off water to delinquent accounts stirred up heated debate in Britain. Indeed, the number of households disconnected for not paying their water bills rose to 21,282 in 1991-92, more than double the number (9,218) the year before privatization. After 1991-92, however, the number of disconnections fell steadily, numbering just 1,129 by 1998-99. In 1999, the Water Industry Act prohibited the disconnection of households and “vulnerable” users like day care centres, doctors’ offices, retirement homes, and schools (Brubaker, 2003: 17).

In July 2003, the British newsweekly *The Economist* compared the privatized water services in England and Wales to those in the government-run system in Scotland. According to *The Economist* (2003),

In 1989, Scotland’s water was comparable to the English utilities in every respect, but the government kept it in public hands. For a while, the Scots benefited from lower bills. But as the new Scottish regulator, Alan Sutherland, recently conceded, things look different now. Scottish water is less efficient than its southern peers, its service delivery is poorer and its water quality is worse; it is, in short, ten years behind. To catch up, it is having to raise water tariffs above English levels. The Scots, it turns out, are paying a high price for keeping their water in public hands.

In the French model, the public authorities, namely, the “communes”

or municipalities “own” the assets and are responsible for sanitation and the provision of drinking water. The management of water services, however, is sometimes delegated to a private business by a call for tender (Boyer et al., 2001: 12). Today, 75 percent of the French get their water from private providers like Veolia, Suez Environnement, or Saur (France, 2009).

In France, private sector involvement takes the form of “leasing” agreements or of concessions.

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With a leasing agreement (*affermage*), the municipality guarantees the infrastructure investments while the private operator covers the day-to-day operating expenses (Boyer et al., 2001: 12). The operator must manage customer relations. The operator is paid directly by the users and sets prices that must be approved through a regulatory mechanism.

The operator also determines the maintenance projects and hiring policies. The municipality, for its part, receives rent from the private firm (Boyer et al., 1996: 19-20). To cover infrastructure investments, the municipality votes each year on what portion of the water rate will be returned to it (the “surtax”). The private operator is responsible for collecting this portion from consumers and remitting it to the municipality within a period of time fixed by the terms of the contract (between three and six months).

With a concession contract, the delegation of responsibility is more extensive insofar as the private operator is responsible not only for operating the system and day-to-day maintenance, but also for infrastructure investments. The private operator is remunerated directly by customers through a fee fixed by the concession contract. In this type of contract, the delegating community is often freed of all financial obligations. In exchange, it must agree to a long-term concession contract. (For the drinking water and sanitation industry, the maximum duration is set by law at 20 years.)

These are the two main water privatization models. Now that we have sketched them out, we must consider which one would be best for Montreal.

Which solution is best for Montreal?

In Quebec, as in the rest of Canada, water distribution is a public service managed by the municipality. The “English” model of privatizing water management, therefore, could only be implemented if provincial

law were to be modified, since municipalities are a creation of the provinces. Such reform seems unlikely at this time, but would arguably be the best alternative for Montreal.¹¹

Consequently, it seems that the “French” model of water management is most realistic for Quebec today. Indeed, in Quebec, as in France, water services are managed by municipalities that own the infrastructure. Therefore, according to the Quebec government, “The municipalities do not have the power to sell off their infrastructures, but they can delegate to private enterprise a portion of their service management activities. This delegation of water management services could include operation, maintenance, and the administration of public works. Municipalities remain, however, responsible for the operation and performance of the infrastructure, notably with regard to their obligations vis-à-vis the government” (Quebec, 2009a).

The legal framework for such delegation already exists in Quebec. Since 2004, cities have been able to opt for “public-private partnerships.” According to the website of l’Agence des partenariats public-privé du Québec, “A public-private partnership is a long-term contract under which a public body allows a private-sector enterprise to participate, with or without a financial contribution, in designing, constructing, and operating a public work. The objective of such a project may be to provide a public service” (Québec, 2009b).

Bill 134, an act to again amend various legislative provisions concerning municipal affairs, details how

public-private partnership projects can be implemented in water management. The act allows a city to entrust a third party with the operation of its water lines or sewer system for a period of up to 25 years and, moreover, to allow those persons (in the legal sense) to finance any related public works. This law was adopted in December 2005 and since then, cities in Quebec have had the option of delegating water management to the private sector (Radio Canada, 2005). To our knowledge, no city has taken this opportunity.

The selection of a private operator should be done by competitive bidding under a transparent, open call for tender. The technical examination of the various proposals should be conducted by an independent third party. Such a system would allow private firms to compete “for the market” (Wolff, 2004: 2). However, precautions must be taken to ensure the competitors do not underbid in order to win the contract, only to exploit contract loopholes to secure increased compensation later (Wolff, 2004: 2). Wolff (2004: 2) also warns that another error consists of granting contracts with durations that are too long in the hopes of attracting long-term investments, which precludes any form of competition for several decades. In Wolff’s view, contracts lasting five to 10 years are long enough to induce private firms to invest.

A good regulatory environment can ensure that the winning bidder fulfills its contractual obligations, particularly with respect to levels of investment, infrastructure maintenance, rates, and customer service.

This requires clear dispute resolution procedures (Wolff, 2004: 3). Water quality may also be controlled by a public body that would guarantee compliance with quality standards, as is the case in England with its Drinking Water Inspectorate (DWI). The consortiums invited to submit proposals must commit themselves to carrying out the work for a certain price and according to a fixed schedule, failing which they expose themselves to financial penalties (Lefebvre, 2009). In addition, the terms and conditions of a carefully designed contract can include incentives to encourage good performance and penalize bad performance (Kitchen, 2006: 11).

As mentioned previously, the “French” model of delegating the public utility to private enterprise in the form of a concession contract would make the private operator responsible not only for operating and day-to-day maintenance expenses, but also for investments. The contract should thus include provisions to ensure that the private companies do, in fact, invest in infrastructure. This investment will offer new sources of capital (Kitchen, 2006: 10). It is true that, as a consequence, water prices will likely increase because rates have long been artificially low, and thus have failed to provide the proper signals to consumers of the cost of all the inputs used to supply them with water. However, under the “French” model, the private operator is remunerated directly by the users through a fee fixed under the concession contract. Therefore, there are limits to the rate increases that the operator can charge.

There has been considerable debate in the past decade about the role of ownership in the performance of water utilities. Elizabeth Brubaker (2003: 15) thinks that, (in England and Wales), “a combination of privatization and regulation has by many measures—including capital investment, drinking water quality, environmental performance, and customer service—been a success. Indeed, it exemplifies just how much privatization, when managed wisely, can accomplish.”

What is needed to improve the performance of the management of water services in Montreal is a competitive environment that will promote efficiency gains, and the participation of the private sector under the “French” model would do so.

Renzetti and Dupont (2004: 1874) emphasize that the possibility of having a number of private firms bidding for the right to run a municipal water system should introduce a strong degree of competition and thus efficiency into the local water supply system. This is because, under the “French” model, a firm will have to compete for the market and will have the incentive to manage the system well in order to realize the greatest returns and to have its contract renewed. According to Kitchen (2006: 11), private sector providers operate in a competitive environment where poor quality, low standards, and lack of accountability will lead to lost business and firm closures. Moreover, in such a system, the private sector is answerable to provincial regulators, to the public, to municipal governments, and to

owners/shareholders, all of which guarantees a certain discipline in fulfilling its obligations and, therefore, leads to improvements in service and water quality (Brubaker, 2008: 53).

There should be no restrictions on the participation of foreign firms. A recent agreement between the US and Canada on government procurement provides for permanent US access to Canadian provincial and territorial contracts in accordance with the World Trade Organization’s Government Procurement Agreement (GPA) (USA, 2010; Taber, 2010). Current negotiations for a free trade agreement between the European Union and Canada envision the opening of Canadian markets to European firms. Such a development would be extremely positive insofar as it would promote greater competition by increasing the number of bidders, provide access to expertise and technical know-how,¹² and limit the risks of conflicts of interest. These multinational water companies are primarily French and, therefore, have a lot of experience with the “French” model of delegating public services to private enterprises. There is Veolia, which provided drinking water to 133.9 million people around the world in 2007, with Suez and Saur serving 100.4 million and 13.6 million customers respectively (Pinsent Masons, 2007: 18). Other important actors include RWE, a German company that provides drinking water to 35.7 million people around the world, and Agbar (or Sociedad General de Aguas de Barcelona), which serves 22.1 million customers.

Conclusion

After years of neglect, aging infrastructure is forcing the city of Montreal to invest considerable sums of money in water infrastructure. Unfortunately, there is no guarantee that the municipality will have the financial means to carry out all of the necessary improvements or that it will do so well. Montreal’s decision to raise taxes and demand contributions from other levels of government relies upon the very body that neglected the problem to solve it—without addressing the root cause. Therefore, until full-cost accounting methods are introduced, water users will not pay for the full cost of water, and infrastructure will continue to fall into costly and wasteful disrepair.

This paper has presented two credible alternatives to the status quo that would increase revenues and sustain water system assets in order to avoid another fiscal shock for the city. One alternative involves pricing water to reflect its actual cost by moving towards full-cost accounting and marginal cost pricing for services. The second complements the first by entrusting the private sector with the supply and treatment of drinking water in Montreal, which will provide new sources of capital and improve efficiency in service delivery.

Although the benefits of market mechanisms in the management of water are substantial and undeniable, the public remains skeptical. It is, therefore, essential to remind Quebecers that water is not free—its price is considerable once the costs of infrastructure maintenance and modernization are taken into account. Water-pricing reform

and the participation of the private sector would help to cover these system costs in the most efficient way. Why not seize this opportunity?

Notes

1 This term covers the provision, storage, and treatment of drinking water, its distribution (system of aqueducts), as well as the collection of wastewater (sewer system) and its treatment.

2 This study, carried out by the SNC-Lavalin-Dessau-Soprin-Aqua Data consortium, was commissioned to supply a technical portrait and an evaluation of the state of the infrastructure.

3 2010 Water Rates for Montreal City

Residential (Immovables in the following categories: residual; six dwellings or more; serviced vacant lots)	\$0.0469 per \$100 of property valuation (adjusted tax value)
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Non-residential	\$0.1690 per \$100 of property valuation (adjusted tax value)
	\$0.53 per cubic metre on excess consumption over 100,000 cubic metres

Rate for non-residential or mixed-use immovables	The tax rate for mixed-use immovables is based on immovable category.
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Source: Ville de Montréal, 2009b.

4 In the Montreal sector, owners of non-residential immovables are

billed for water consumed in excess of 100,000 cubic metres.

Example:

Consumption	150,000 cubic metres
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Water in excess of 100,000 cubic metres	50,000 cubic metres
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Rate per cubic metre	x \$0.22
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Price of water	= \$11,000
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Source: Ville de Montréal, 2010.

5 Marginal cost is the change in total cost that arises when the quantity produced changes by one unit. That is the cost of producing one more unit of a good.

6 A network of water gates (“vannes de régulation”) can measure and adjust the pressure in the water system, especially at night when the demand is lower. The idea is that such a device will reduce the need for water treatment, reduce leakage, and increase the lifespan of water lines (Noel, 2009b).

7 This includes the \$106 million contract for the installation and operation of the water meters and the installation of 600 water gates.

8 Montrealers do not know the true cost of the water they consume since it is not itemized specifically in their property tax bill.

9 According to Quebec’s *Groupe de travail sur la tarification des services publics*, the presence of water meters in every household and in industrial, commercial, and institutional buildings reduces consumption by 15 to 30 percent for households, business, and industry (Quebec, *Groupe de travail sur la tarification des services publics*, 2008: 110).

10 According to Brubaker (2003: 16), of the nearly three million tests carried out in 2002, 99.87 percent complied with drinking water standards. The 0.13 percent of the tests that

failed to meet the standards represented a significant improvement over the 1 percent that had failed under government control, prior to privatization.

11 As underlined by Elizabeth Brubaker, “Given political realities [in Canada], few local or central governments are likely to experiment with private ownership” (Brubaker, 2008: 49).

12 As Elizabeth Brubaker has stressed (2008: 50-51), several of the large multinational water companies have more than a century of experience. They invest hundreds of millions of dollars per year in research and development. They have thousands of specialized employees, whose skills can be put to use in resolving local problems and in optimizing efficiency.

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ISSN 1714-6720

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Editing, design, and production

Kristin McCahon

Acknowledgements

The author would like to thank Diane Katz, Steven Renzetti, and Frédéric Lasserre for their helpful comments on this Alert.