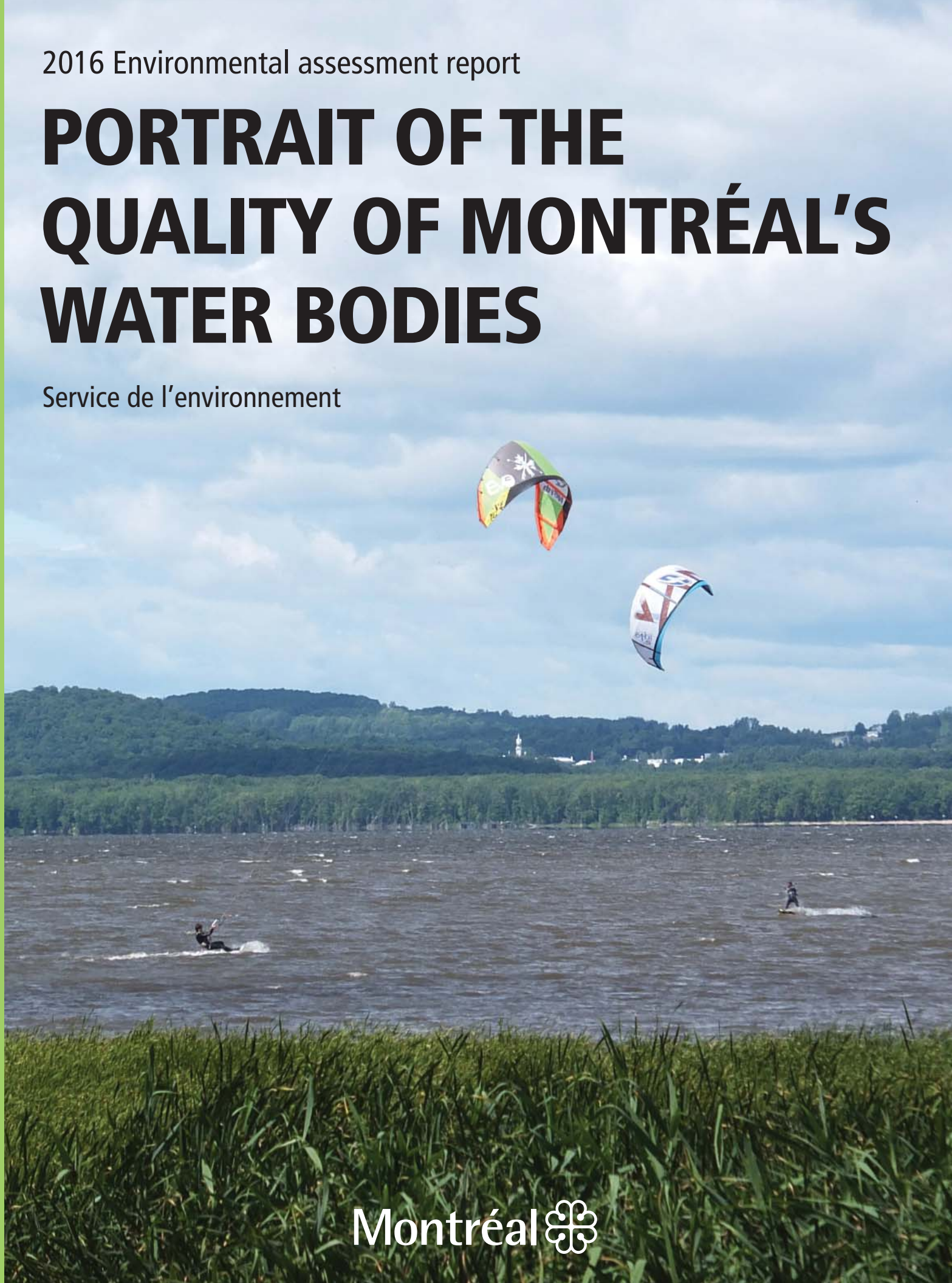
2016 Environmental assessment report

PORTRAIT OF THE QUALITY OF MONTRÉAL'S WATER BODIES

Service de l'environnement



Montréal

Highlights

In 2016, the *Réseau de suivi du milieu aquatique* (RSMA) pursued its sampling program of the shoreline waters, streams, inland waters and stormwater sewer systems of the territory of the agglomeration of Montréal.

QUALO: a return to the mean

60 of the 102 sampling stations of the program, a proportion of 59%, obtained their QUALO certification, confirmation that they were conducive to direct contact water uses and an increase of 9% relative to 2015. This percentage replicates the mean obtained since the beginning of the program in 1999.

RUISSO: a continuous improvement

The comparison of the RUISSO index results over the past two years shows an improvement in the water quality of streams and inland waters in 2016, essentially due to a drier summer season. An analysis, based on the results calculated for the RUISSO index, shows that the water quality improved in 9 of the 24 water bodies, remained stable in 11 of them and deteriorated in the last 4.

PLUVIO: more and more illicit connections (Ic) corrected

Of the 588 stormwater sewer systems present on the territory, 190 were found to be sufficiently contaminated at their outlet into a stream or waterway to warrant a detailed study. Up until now, 1,017 illicit connections (Ic) have been confirmed, 293 being located in reconstituted cities and 724 in boroughs. Of these, no less than 405 illicitly connected buildings have been corrected, 223 in reconstituted cities and 182 in boroughs.

A hot and dry summer in 2016

Montrealers were treated to an abnormally hot winter and spring, the average temperatures in April being the exception as they were below normal. Indeed, temperatures were generally above seasonal averages. The summer was also hot and dry, August being the hottest on record. The hot temperatures persisted until mid-October with temperatures ranging considerably above seasonal averages. Furthermore, temperatures exceeding 30 °C were almost twice as frequent as on average in 2016, with 16 such days recorded instead of an average of 9.

With only 335 mm, precipitations during the summer were far below the average of the past 10 years (465 mm). It is worthwhile mentioning that 558 mm of rain were recorded in the previous year. However, the summer of 2016 witnessed many episodes of heavy rainfalls, of which five that accounted for more than 50% of the seasonal precipitations. In 2016, the percentage of samples collected during a rainfall was about 15% for the sectors of Lac Saint-Louis, the Bassin de La Prairie and the St. Lawrence River, whereas the percentages for the sectors of Île Bizard and the Rivière Des Prairies were respectively of 8% and 2%.

The spring flood was a little higher than in 2015, with an average flow rate in April of 2,174 m^3/s in the Rivière Des Prairies and of 11,117 m^3/s in the St. Lawrence River. However, summer low-water levels were rather significant in the Rivière Des Prairies with flow rates at 690 m^3/s but average in the St. Lawrence River at 7,700 m^3/s, from July to October.

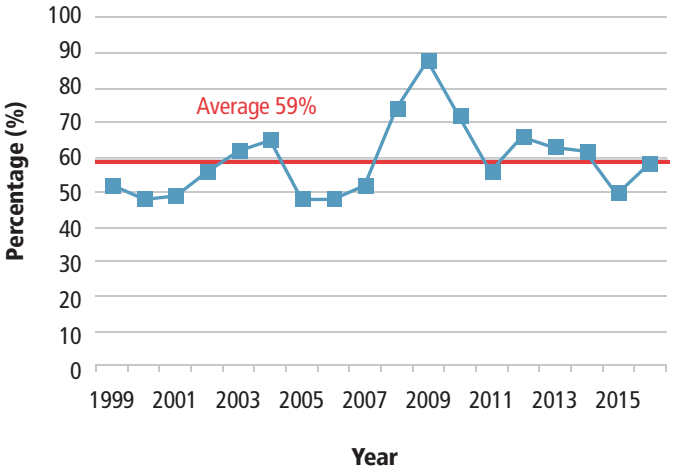
Spring flood at the Anse-à-l'Orme Nature Park (2016.05.10)

QUALO: a return to the mean

In 2016, 102 sampling stations were visited on a weekly basis between May 9 and September 22 over a period of 20 consecutive weeks. A total of some 2,020 samples were analysed for the fecal coliform (COLI) count. The COLI count is an indication of the degree of the water's contamination by faecal matters as expressed in colony forming units (CFU) per 100 mL. A sampling station earns its QUALO certification if it satisfies the two following conditions: the geometric mean of its results does not exceed 200 COLI and no more that 10% of its samples exceed 400 COLI.

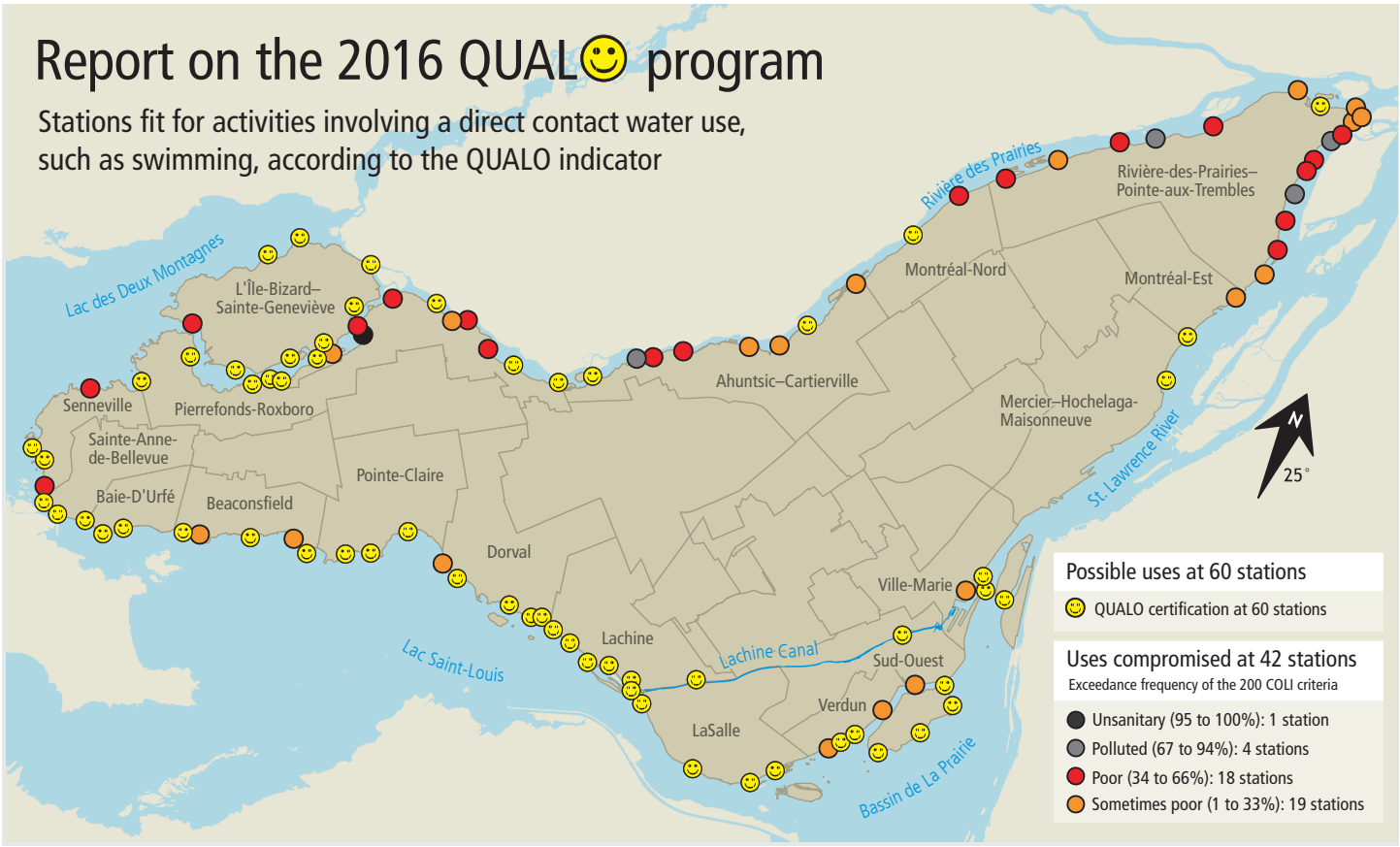
Although rainfalls were relatively infrequent throughout the summer, they negatively impacted the quality of shoreline waters nonetheless, since at least three rainfall events exceeding 30 mm occurred during the sampling period. Of the program's 102 stations, 60 obtained the QUALO certification, or 59% of them, compared to 50% in 2015. This percentage replicates the average obtained since the beginning of the program initiated in 1999. The year 2016 thus marks a return to the historic mean for the quality of shoreline waters.

Evolution of the total percentage of QUALO stations since the beginning of the program in 1999



With respect to the COLI criteria for direct water uses:

- 78% of samples respected the 200 criteria allowing for direct water uses (swimming);
- 7% of samples exceeded the 1000 criteria, thereby compromising indirect water uses (sport fishing, boating).



Report by water body

Rivière des Prairies: 41% QUALO

The river's sampling days were relatively spared by rainfalls since no more than 2% of the samples were taken while it was raining (versus 34% in 2015). With a score of 41%, the percentage of stations having obtained their QUALO certification was slightly lower than the average for this sector since the beginning of the program in 1999, but significantly greater than that obtained in 2015 (28%). Local improvements in water quality were also observed at 6 of the 37 stations. The stations located in the Rive-Boisée (Pierrefonds-Roxboro) and Cheval-Blanc (Rivière-des-Prairies–Pointe-aux-Trembles) parks obtained the worst results for the river, respectively with 15 and 8 exceedances of the 1000 COLI criteria.

Île Bizard: 88% QUALO

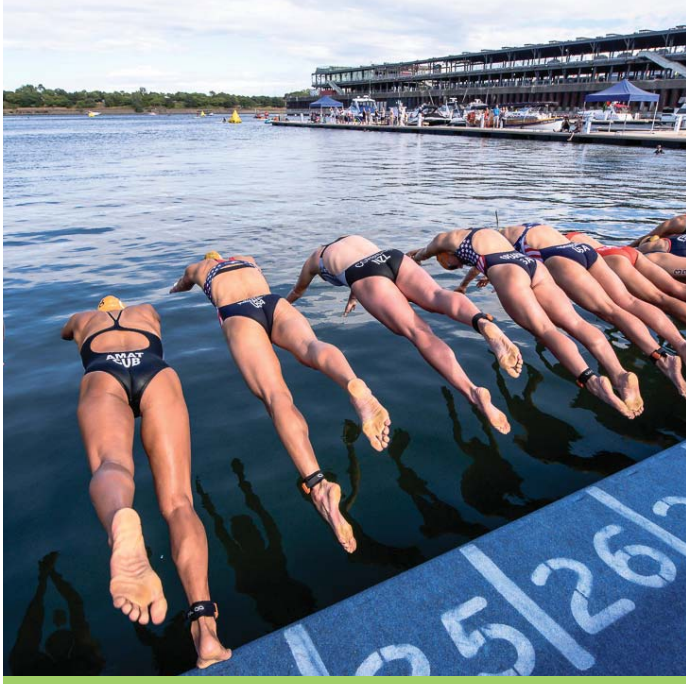
As is often the case, the quality of the shoreline waters of this sector was very good and the absence of rainfalls during the sampling activities may have played a favorable role in these results. Of the eight stations surrounding Île Bizard, just one station located at the western end of the island was not QUALO certified, given four slight exceedances of the 400 COLI criteria. However, no exceedances of the 1000 COLI criteria were reported.

Lac Saint-Louis: 84% QUALO

The percentage of QUALO certified stations earned the year 2016 the 3rd rank in terms of the best results garnered since the program's inception in 1999. However, four stations were downgraded, two of which because of the poor quality of the waters discharged by the Saint-James and Denis streams. Similarly to last year, downgrades were observed at Angell Park with three exceedances of the 400 COLI criteria as well as at Godin Park owing to three results exceeding 1000 COLI.

Bassin de La Prairie: 81 % QUALO

Owing to the construction works on the Champlain Bridge, the station located at the foot of the bridge was moved 200 metres upstream. The quality of the waters of this new station is also a reflection of the influence of the spillovers of the Saint-Pierre overflow structure. The percentage of QUALO certified stations increased to 81%, slightly above the average obtained for this sector since the program's launch in 1999 (78%). The quality of the waters of the Bassin de La Prairie was less affected by the heavy rainfalls that occurred in the summer of 2016 relative to those in 2015.



Montréal International Triathlon

Last August 7, 2016, 1,007 participants from 28 countries accepted an invitation by the Montréal International Triathlon under the auspices of the International Triathlon Union (*ITU*). Disputed in the heart of the Old Port of Montréal, the Triathlon distinguished itself through its urban circuit, with its swimming heat in the Jacques-Cartier Basin and running and cycling in the streets of Old Montréal.

Credit: © Araujo Wagner / ITU

St. Lawrence River: 25% QUALO

Again this year, the percentage of QUALO certified stations was significantly less than the sector's average since the beginning of the program (46%). The heavy rainfalls observed on three occasions during the sampling tours undoubtedly resulted in a deterioration of shoreline waters following the spillovers of untreated wastewaters at the various overflow structures. The Old Port station, which was QUALO certified since 1999, lost its certification owing to three exceedances of the 1000 COLI threshold. Inversely, the two stations located at each extremity of the Promenade-Bellerive Park were QUALO recertified. After more than 10 years of good quality, they were decertified in 2015. The 11 other stations downstream were all decertified, including those of the Clémentine-De La Rousselière and Pierre-Payet parks with exceedances of the 200 COLI criteria respectively of 70 and 75%.

RUISSO: a continuous improvement

In 2016, the sampling focused on 24 streams and inland waters, and relied on a total of 50 stations, the same number as in 2015. These stations were sampled on seven occasions between May 9 and November 9. A total of 345 water samples were collected for analysis purposes and 8,363 physicochemical and bacteriological analysis results were used to calculate the RUISSO index (RI) at each of the stations. On the basis of the RI results calculated, one notices that the water quality in 2016 improved in 9 of the 24 streams and inland waters, remained stable in 11 of them and deteriorated in the other 4. The overall improvement is likely explained by the drier summer season experienced in Montréal in 2016.

Evolution of the water quality of streams and inland waters*

* The percentage obtained is based on the same 45 stations that were sampled in the past five years. From 2015 to 2016, the percentage of stations whose quality was characterized as "excellent, good or fair" increased from 36 to 47%, the percentage of stations whose quality was rated "poor" declined from 27 to 18% and the percentage of stations with a "polluted" water quality decreased from 38 to 36%.

As in the past, the water bodies that are supplied by an aqueduct system, artesian wells or the waters of the St. Lawrence River are generally of good quality. Accordingly, the waters of the Lacoursière and Dr-Bernard-Paquet parks were characterized as being "excellent" whereas five other water bodies were rated "good", particularly urban ponds and certain marshes.

This year, the "fair" category comprises six water bodies. The Bois-de-l'Île-Bizard Nature Park Marsh and La Fontaine Park Pond as well as the O'Connell and Bouchard streams joined the Des Battures Lake and the À l'Orme River in this category.

Evolution of the characterization of streams and inland waters according to the RUISSO index*

Streams and inland waters	Deficiency in water	RI 2015	RI 2016	Evolution **
Lacoursière Park Pond	0%	1	1	=
Dr-Bernard-Paquet Park Pond	0%	2	1	+
Angrignon Park Pond	14%	1	2	=
Lachine Canal	0%	2	2	=
Beaver Lake	0%	2	2	+
De La Brunante Basin	0%	2	2	=
Des Sources Nature Park Marsh	0%	2	2	–
La Fontaine Park Pond	0%	2	3	=
Bois-de-l'Île-Bizard Nature Park Marsh	0%	2	3	–
Des Battures Lake	0%	3	3	=
À l'Orme River	5%	3	3	=
O'Connell Stream	0%	4	3	+
Bouchard Stream	0%	4	3	+
Terra-Cotta Stream	0%	4	4	=
William Cosgrove Centennial Park Lake	0%	4	4	+
Pinel Stream	14%	4	4	–
Saint-James Stream	0%	5	4	+
Bertrand Stream	2%	4	4	+
Denis Stream	0%	5	4	+
Meadowbrook Stream	0%	5	5	=
Château-Pierrefonds Stream	0%	5	5	+
De Montigny Stream	0%	5	5	=
Coulée Grou	43%	4	5	=
Pointe-aux-Prairies Nature Park Marsh	14%	4	5	–

RI categories

- Excellent (RI-1)
- Good (RI-2)
- Fair (RI-3)
- Poor (RI-4)
- Polluted (RI-5)

* Taking into account all parameters, the RI determines the water quality category of each of the stations. The category of a water body is determined by calculating the average of the RIs obtained at all of its stations.

** The evolution was characterized as stable (Evolution: =) when the reading of the RI from one year to another revealed a variance of less than 5 points. Thus, a water body can remain in the same RI category (20 points by category) even though it may have evolved by more than five points, as was the case for Beaver Lake.

Despite the change in category from good to fair, the water quality of the marsh of the La Fontaine Park remained stable. As for the water quality of the O'Connell and Bouchard streams, it improved significantly, resulting in an upgrade of its characterization from poor to fair.

As far as the À l'Orme River is concerned, the results obtained at the tributaries from Baie-D'Urfé and Sainte-Anne-de-Bellevue remained stable. However, while the waters from Baie-D'Urfé were of excellent quality, those from Sainte-Anne-de-Bellevue, on the contrary, showed a phosphorus enrichment. Poor results were also found near another supplied tributary, this time by rainwaters from Kirkland residential sectors. The presence of high fecal coliform values (an average of nearly 8,000) indicate the likely persistence of illicit connections, despite the corrections that were performed.

The streams and inland waters with a water quality characterized as "poor" are generally affected by pollution issues, such that the indexes calculated are more or less stable over the years. Illicit connections are present in many of the water traps that supply them. This is the case of the Bertrand, Denis, Pinel, Terra-Cotta and Saint-James streams as well as the William Cosgrove Centennial Park Basin. The water quality of the Denis and Saint-James streams improved in 2016, their index having passed from the "polluted" to the "poor" category.

Finally, certain water bodies suffer from a chronic or occasional deficiency of their water supply. This is particularly the case for the Pinel Stream, the Pointe-aux-Prairies Nature Park Marsh and the Coulée Grou. A reclassification of the water quality from "poor" to "polluted" was obtained for the last two of these water bodies. The Meadowbrook, De Montigny and Château-Pierrefonds streams complete the listing of polluted water bodies. The waters of the De Montigny Stream, fed by the drainage waters of the Anjou industrial sector fared particularly badly (fecal coliforms, suspended matters and total phosphorus). And although the quality of the waters of the Château-Pierrefonds Stream improved somewhat, they still remained polluted.

PLUVIO: more and more Ic corrected

The PLUVIO program was launched in 2007 to identify, locate and correct problems related to illicit connections (Ic) on the territory of the agglomeration of Montréal. Over the years, some 570 problem sectors, that is to say street segments that may have been affected by Ic, were identified by the RSMA in over 100 stormwater sewer networks, which totalled some 8,500 civic addresses.

The territory of Montréal has 588 stormwater networks. Of the 190 problem networks, more than half were exempt from Ic, either because the contamination was of a diffuse or animal origin (84) or because the Ic were corrected (13). As for the 93 other networks, our screening and correction efforts will continue over the next few years.

Status of the 588 stormwater networks in 2016

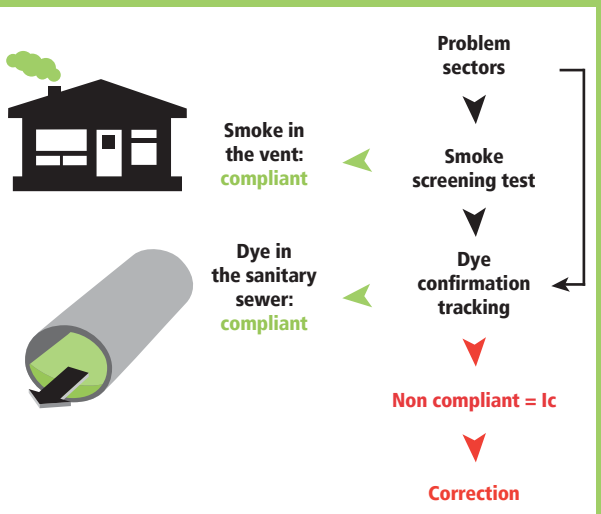
Non problematic networks		398	
Problematic networks		190	
Details of the problematic networks			
No illicit connection (Ic)	84		97
Corrected	13		
Awaiting corrections	53		93
Awaiting screening	40		
Total		**190**	

RSMA screening activities in 2016

The RSMA focused its screening efforts on 75 sectors distributed among 17 stormwater networks where corrections had been implemented or to screen sectors where no Ic had been detected during the detailed screening of buildings. In these 75 sectors, 47 proved to be corrected or exempt of any Ic whereas 28 required a more extensive screening to detect buildings having an Ic. These sectors were located in the territories of Anjou, Beaconsfield, Dollard-des Ormeaux, Dorval, Kirkland, Pierrefonds-Roxboro, Pointe-Claire, Rivière-des-Prairies–Pointe-aux-Trembles and Sainte-Anne-de-Bellevue.

On the other hand, the screening conducted in 2016 allowed for the delimitation of 20 new problem sectors in 9 of the 17 stormwater networks that were analysed. These sectors, which total 490 civic addresses, will require further screening to identify the illicitly connected buildings.

Smoke and a dye to screen for Ic*



* An illicit connection (Ic) is a connection or defect that allows sanitary wastewaters to seep elsewhere than in a domestic or combined sewer network, for instance in a storm sewer network, on the ground, in a ditch or in a water body, with the exception of septic tanks.

Progress of Ic screening and correction

Of the 90,000 civic addresses or so served by separate (sanitary) sewer networks and mainly located at the extremities of the island, almost 73,000 of them are located in networks screened by the RSMA. Since the inception of the program, 19,145 addresses have been detected and of these 17,744 had no Ic (93%). Of the 1,401 civic addresses that were liable to have been affected by Ic, 384 addresses deemed non compliant after the smoke screening test require further analysis through dye confirmation tracking. 1,017 addresses were confirmed as being illicitly connected.

The table below presents the progression of the Ic correction work accomplished since the beginning of the PLUVIO program.

Progress of the Ic correction program

	Cities	Boroughs	Total
Ic confirmed	293	724	1,017
Ic corrected	223	182	405
Not corrected	70	542	612

Clearing of the shoreline area along the Bertrand stream

It is regrettable that even in 2016, the Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains (*Politique de protection des rives, du littoral et des plaines inondables*) of the *Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques* is not always respected as shown in this drastic clearing of vegetation from the banks of the Bertrand Stream near the Bois-de-Liesse Nature Park. In this case, the Ministère issued a notice of violation ordering the owner to submit a remediation plan for this rare and vulnerable environment, when it would have been much easier to protect the shoreline area from the onset.

Before
July 2015

After
Septembrer 2016

ville.montreal.qc.ca/rsma

FOR FURTHER INFORMATION

The reader is invited to consult the RSMA's Web site at **rsma.qc.ca** and Ville de Montréal's open data at **donnees.ville.montreal.qc.ca**.

VILLE DE MONTRÉAL

PRODUCTION
Service de l'environnement
Division du contrôle des rejets industriels
Réseau de suivi du milieu aquatique

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