



Lead Service Lines in the City of Montreal

Long term vision, execution and key takeaways

Great Lakes and St. Lawrence Cities Initiative
2016 Annual Meeting
June 16, 2016 - Niagara Falls

CHANTAL MORISSETTE

Director
City of Montréal Water Service

LEAD SERVICE LINES

City of Montreal

AGENDA

- ◉ Montreal by numbers
- ◉ Historical perspective
- ◉ Scope of the problem
- ◉ Citizen information campaign
- ◉ Research and evidence
- ◉ Current situation and beyond
- ◉ Closing remarks





CITY OF MONTREAL

CITY TERRITORY BY NUMBERS

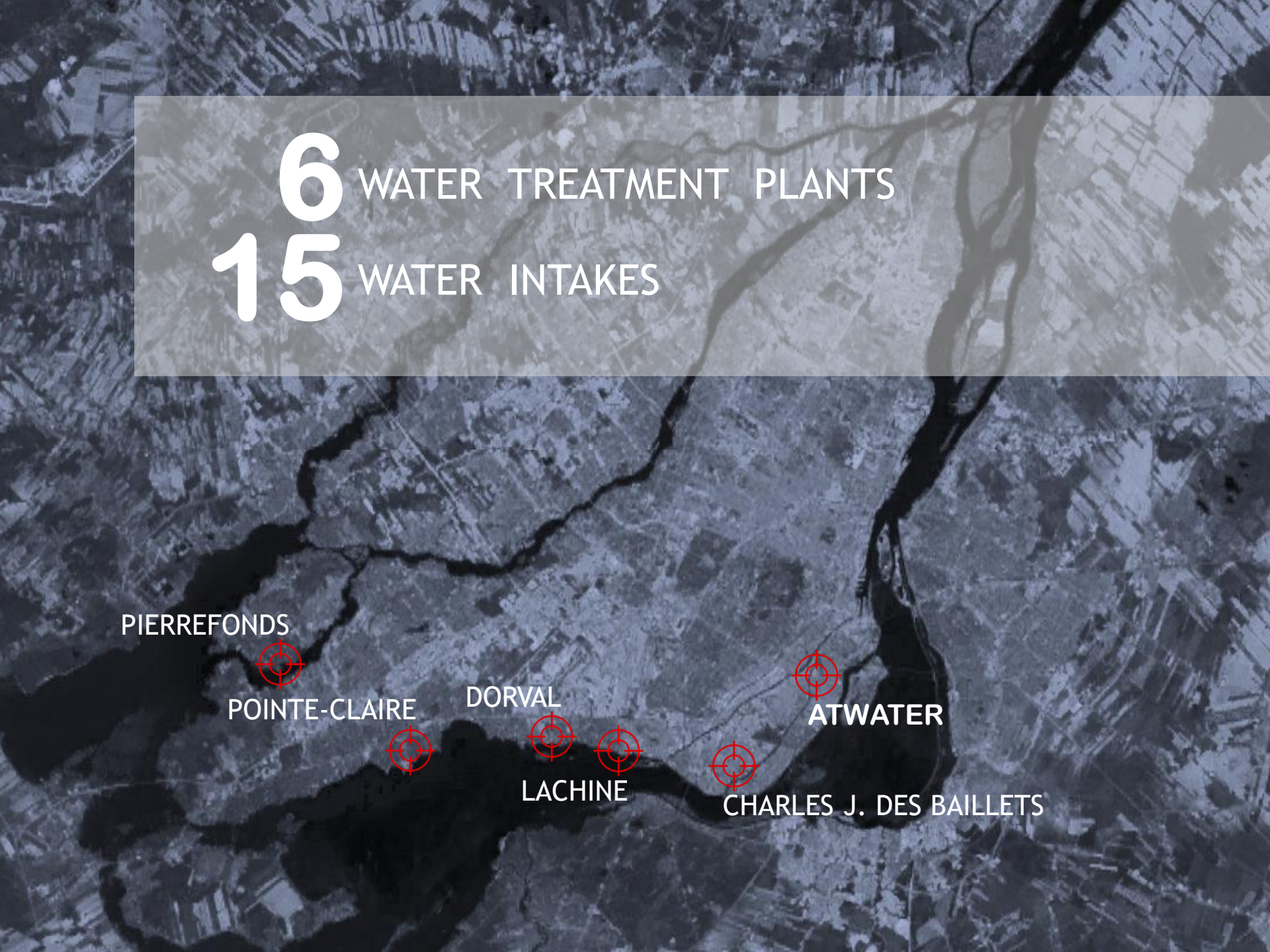
- 1.8 million citizens
- 19 boroughs
- 15 cities within the Island of Montreal

MUNICIPAL STAKEHOLDERS

- ⦿ Citizens
- ⦿ Public Health Department

PROVINCIAL STAKEHOLDERS

- ⦿ MDDELCC (sustainable development/environmental protection)
- ⦿ Ministry of municipal affairs



6 WATER TREATMENT PLANTS
15 WATER INTAKES

PIERREFONDS

POINTE-CLAIRE

DORVAL

LACHINE

ATWATER

CHARLES J. DES BAILLETS



WATER TREATMENT PROCESS

- ◉ Screening
- ◉ Chemical Treatment - Coagulation
- ◉ Sand Filtration
- ◉ Disinfection - Ozonation
- ◉ Disinfection - Ultraviolet Light
- ◉ Disinfection - Chlorination

4300 KM WATER MAINS (2672 Miles)
315 000 SERVICE LINES



HISTORICAL PERSPECTIVE

Timeline

2001: Lead standard: 50 $\mu\text{g/L}$ - 10 $\mu\text{g/L}$ (after 5 minutes of flushing)

2004: A resident (living in Wartime house in borough of Saint-Laurent) contacted the City because of lead in tap water ($[\text{Pb}] = 16 \mu\text{g/L}$)

2005: **First sampling initiative**

- ◉ Low lead concentration in water filtration plants and on several points of the water distribution system ($< 2 \mu\text{g/L}$)
- ◉ Lead concentrations below standard in schools & hospitals ($< 10 \mu\text{g/L}$)
- ◉ 69 % of Wartime houses had lead concentration above the standard ($< 10 \mu\text{g/L}$, max = $38 \mu\text{g/L}$)

HISTORICAL PERSPECTIVE

Timeline

2006: ACTION PLAN

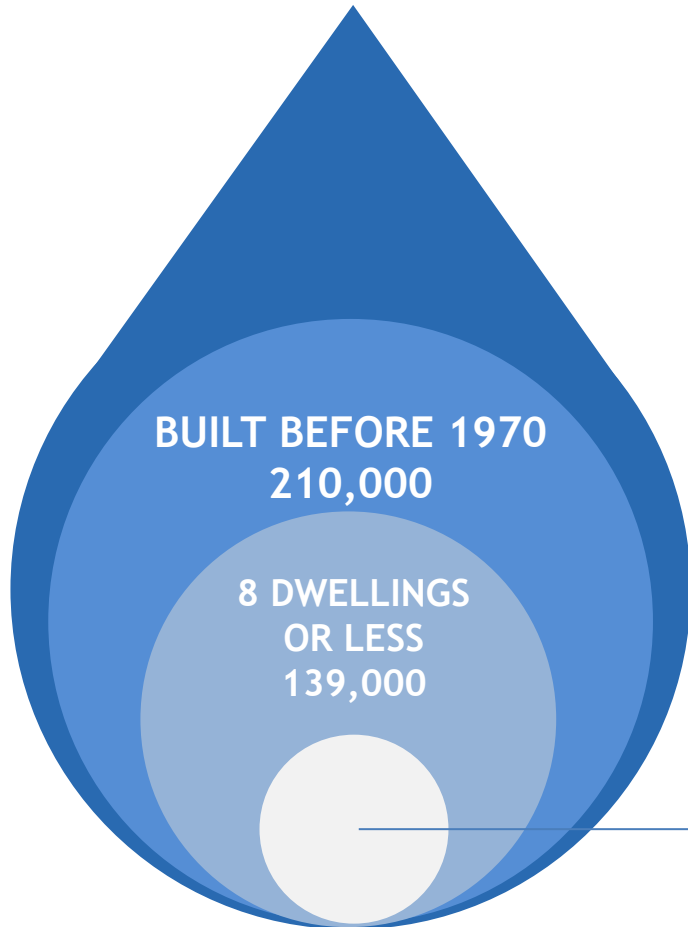
- ◉ Determine scope of problem
- ◉ Inform citizens
- ◉ Take action

SCOPE OF THE PROBLEM

Criteria for the possible presence of a LSL

TOTAL NUMBER OF BUILDINGS

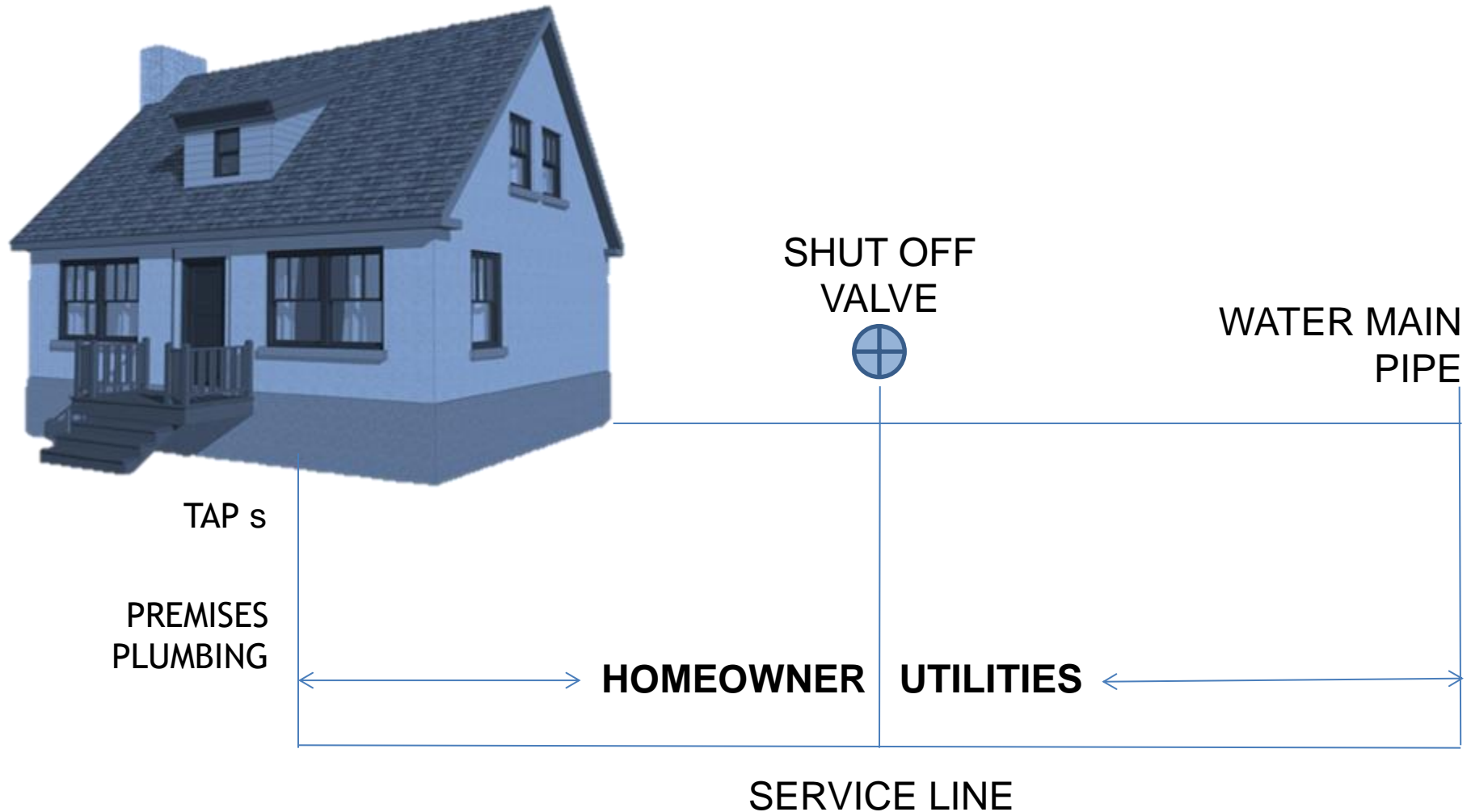
315,000



POSSIBLE PRESENCE OF LSL
69,000 BUILDINGS

SCOPE OF THE PROBLEM

Homeowner and public responsibility



2007

Citizen information campaign

- Press conference
- Letter to citizens with prevention tips
- Information hotline launch
- Website launch
- Information leaflet distribution



2007 Citizen information campaign

After replacing the public side LSL

- Informed citizens about the the private section
- Recommendations to reduce lead concentrations
 - Flushing
 - Remove and clean aerators regularly
 - Use bottled/filtered water (expectant mothers or children <6 yrs old)
 - Replace the private section of LSL



LET THE COLD WATER RUN FOR AT LEAST 15 MINUTES BEFORE DRINKING IT.

The replacement of the municipal portion of your lead water service connection may cause lead particles to accumulate in your home's plumbing.

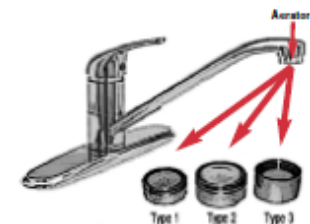
Please follow these four steps before drinking water from your faucets:

- 1- Let the water run from your property's outdoor faucet or the one closest to the water intake (basement) for 15 minutes at maximum flow rate.
- 2- Remove the aerator from the main faucet (usually the kitchen) and let the water run for 15 minutes at maximum flow rate.

Over the next two weeks

- 3- Remove and clean the aerators from your faucets regularly before drinking water.
- 4- If you have not turned on the taps for a few hours, for example in the morning and after work, let the water run for a few minutes until it becomes cold or cool (in summer) before drinking it.

Some faucets may be different than the one illustrated below, or equipped with aerators that are not easily accessible. We suggest that you use a faucet **with an aerator** that can be cleaned during this period or drink filtered or bottled water until the faucets have been cleaned. Please read the safety tips in the enclosed brochure.



To eliminate a potential source of lead in your drinking water, we suggest that you replace the water service connection on your property which could still contain lead. For more information, please read the enclosed brochure.

If you have questions, please call 311 or visit the Montréal website at ville.montreal.qc.ca/eaudemontreal

LSL REPLACEMENTS

In order of priority

Utilities LSL replacements with other work

- ◉ Main water pipe rehabilitation
- ◉ Main water pipe reconstruction
- ◉ Road reconstruction

Citizen application

- ◉ Citizens can apply to the city to have the remaining utilities section replaced once they have replaced homeowner side.

2008 - NEW SAMPLING PROTOCOL

New portable device offers rapid detection

City of Montreal tests new portable device for LSL detection - 2008-2009

- On-site measurement of lead at the tap
- Results in 3 minutes
- Low cost



2012 - RESEARCH PROJECT

Impact on blood levels

CWN Study evaluates the impact of drinking water on blood lead levels (BLL) of children aged 1-5 in Montreal

- 306 participants
- Drinking water flowing through LSL is not a negligible source of exposure to lead and may be a persistent significant contributor to children's BLL
- The risk of having blood lead levels higher than 5 $\mu\text{g}/\text{dL}$ is more elevated in Wartime houses (mean: 4,5 $\mu\text{g}/\text{dL}$)

2013 - RESEARCH PROJECT

Impact of partial LSL replacement

2013-2015 CWN study on the impacts of partial LSL replacements on lead release in drinking water

- ◉ Galvanic corrosion: Acute particulate lead release (pilot-scale results)
- ◉ Frequency and duration of phenomenon not validated at full-scale: study in Montreal

Recruitment & enrollment of 35 single-family homes for a 6-20 months monitoring:

- ◉ Including worst-case wartime homes with very long LSLs

Conclusions:

- ◉ **Decrease** of lead release over long-term after PLSLR
- ◉ **Lead concentrations are still high** or over regulatory levels for households with long LSLs (private side), especially wartime homes
- ◉ **Short-term increase of particulate Pb in water** - Importance of flushing immediately after & in the weeks following replacement work (full and partial)

2016 - TODAY AND BEYOND

Current situation and Action Plan

Accelerate the LSL replacement program according to the following guidelines:

- ◉ Pair with capital investment program
- ◉ Replace all LSL in wartime houses in next 5 years
- ◉ Encourage citizens to replace the homeowner side of the LSL
- ◉ Replace the utilities side of LSL when homeowner side replaced by citizen

Heighten citizen awareness and reach out with timely communication pieces

- ◉ July mail campaign to occupants where LSL suspected in home
- ◉ Information leaflet with recommendations
- ◉ Website updated with information video streaming

CONCLUDING REMARKS

Summary and final words

- LSL REPLACEMENT PROGRAM BEING FAST TRACKED
- PUBLIC AWARENESS TO INCREASE HOMEOWNER REPLACEMENT
- STAY THE COURSE WITH NEW REGULATION GUIDELINES

MEASURE TWICE,
CUT ONCE...



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