



***Legionella* Prevention** — Vancouver Building By-law Amendments
Standing Committee on City Finance and Services

Development, Buildings and Licensing | June 10, 2020

Agenda

- **Background — Public Health Protection**
Legionnaires' disease: severe and preventable
- **Review Phase 1 — Outbreak Response**
Operating permit program
(December 5, 2018 Report)
- **Propose Phase 2 — Outbreak Prevention**
Verification and validation of maintenance
(June 10, 2020 Report)

Presenters

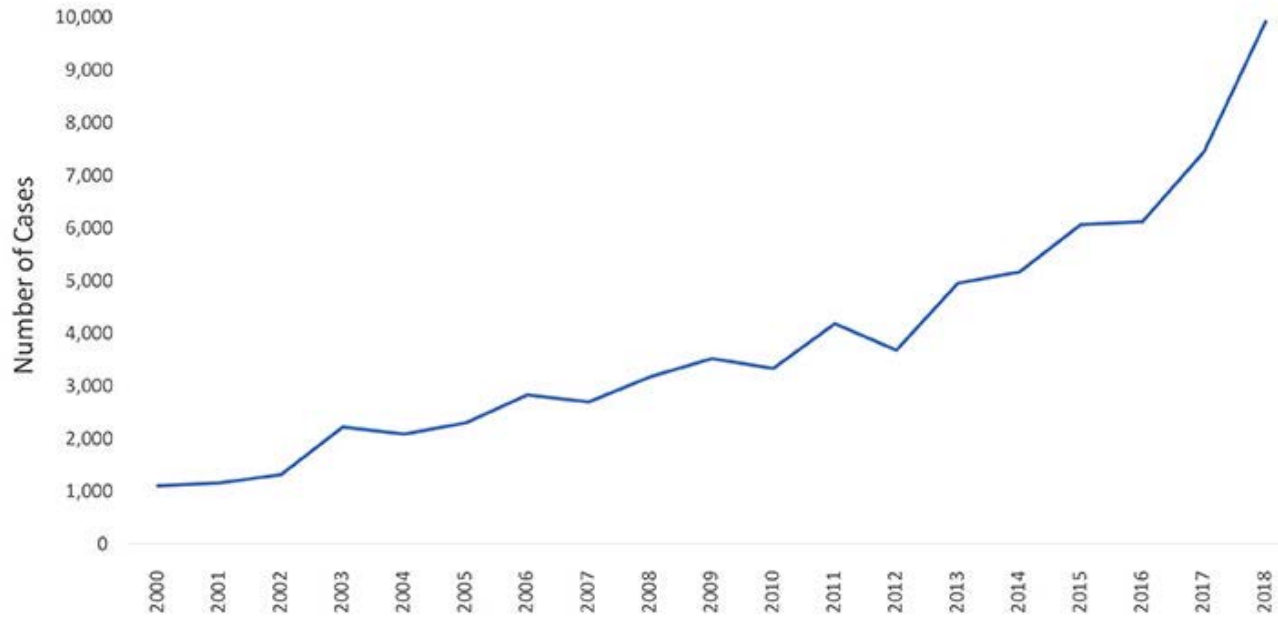


- **Jessie Adcock**, MBA
City of Vancouver
General Manager, Development, Buildings and Licensing
- **Dr. Michael Schwandt**, MD MPH CCFP FRCPC
Vancouver Coastal Health Authority
Medical Health Officer
Regional Lead for Health Protection
- **Phillip White**
City of Vancouver
Manager, Plumbing and Mechanical Inspections
- **Christopher Radziminski**, MASc PEng RPBio
City of Vancouver
Building Policy Engineer

Available for Questions

- **Patrick Ryan**, MSc PEng
City of Vancouver
Chief Building Official
- **Arne Faremo**, CPHI(C)
Vancouver Coastal Health Authority
Environmental Health Officer
(On secondment to Development, Buildings and Licensing)
- **Daniel Roberge**, PEng
City of Vancouver
Director of Water & Sewers – Design, Construction & Operations
- **Andrea Becker**, PEng
City of Vancouver
Branch Manager, Waterworks Design

Legionnaires' disease is on the rise in the United States 2000-2018



9x
increase
since
2000

estimates that the number of persons with Legionnaires' disease in the United States ranges from **52,000 to 70,000 each year**



August 2019

Consensus Study Report
HIGHLIGHTS

Management of *Legionella* in Water Systems

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Sources: cdc.gov/legionella/images/national-incidence.jpg and
nap.edu/catalog/25474/management-of-legionella-in-water-systems



By **Antonia Zerbisias** Special to the Star
Fri., Feb. 21, 2014 | ⌚ 2 min. read

135 cases, 23 fatalities

In this 2005 file photo, medical workers at Rouge Valley Centenary Hospital treat a patient from Seven Oaks Home for the Aged, where there was an outbreak of legionnaires disease. **RON BULL / TORONTO STAR FILE PHOTO**



Source: thestar.com/news/gta/2014/02/21/seven_oaks_home_for_the_aged_class_action_suit_reaches_12_million_settlement.html

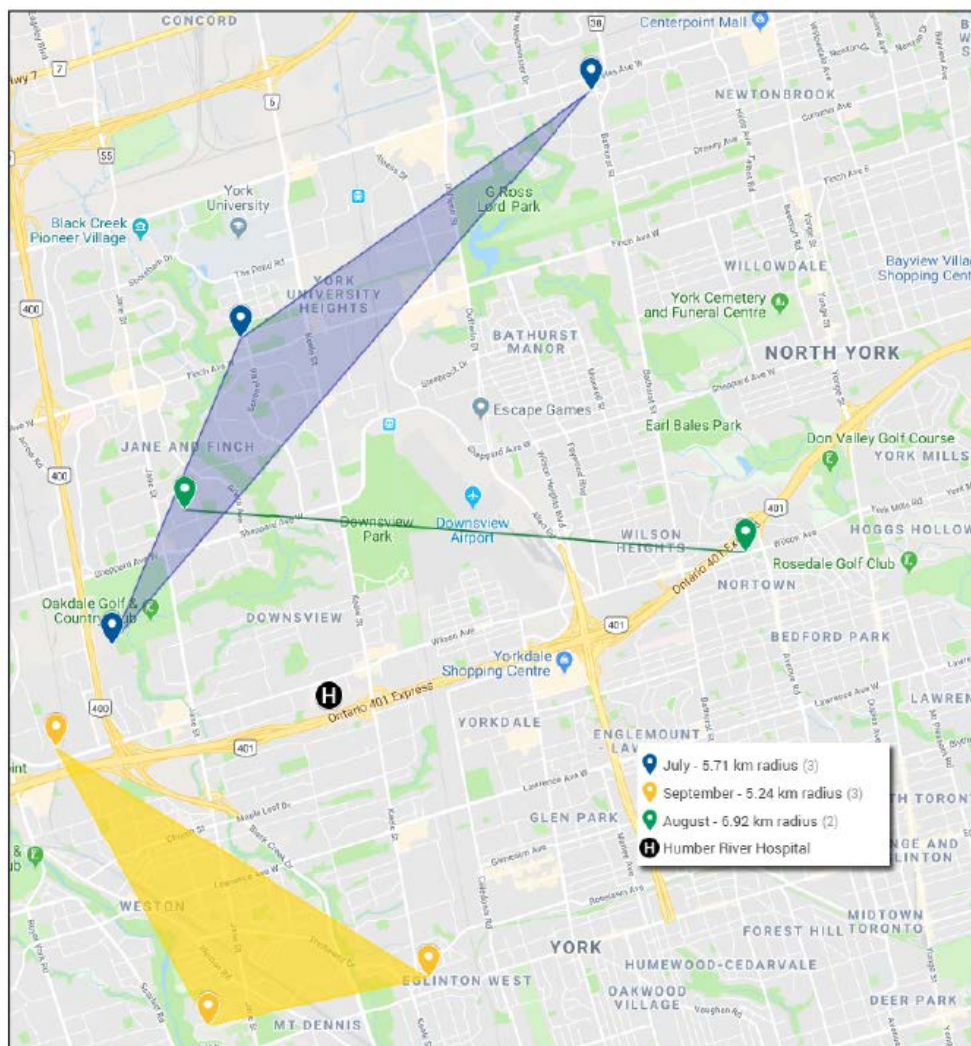


Figure 1. Legionnaires' disease outbreaks in North York, ON in summer, 2018. Colored pins represent the patients' residential addresses.

“... **at least three outbreaks** occurred in North York, ON in the summer of 2018.”

“Out of 33 patients tested, 9 (**28%**) were positive for *Legionella*.”

“... we believe that ... **testing of all summertime cases of pneumonia** for Legionellosis will significantly benefit community health.”

COURT FILE NO.: 05-CV-299031CP [Toronto]

DATE: 20090415

**ONTARIO
SUPERIOR COURT OF JUSTICE**

[48] Dr. Stout provided her opinion that the circumstances of the outbreak as described in the October 21 press release from Toronto Public Health strongly suggest that Toronto failed to implement reasonable maintenance and monitoring procedures in accordance with accepted industry standards (the “ASHRAE Guidelines”) to minimize and control *Legionella pneumophila* in the cooling tower.

FLINT'S DEADLY WATER

SEPTEMBER 10, 2019 // 54:47

FLINT WATER PLANT



How *Legionella* affects building water systems and people

1. Internal and external factors can lead to *Legionella* growth in building water systems.

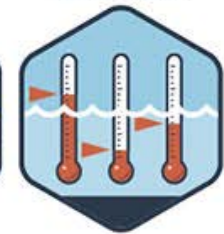
Construction



Biofilm



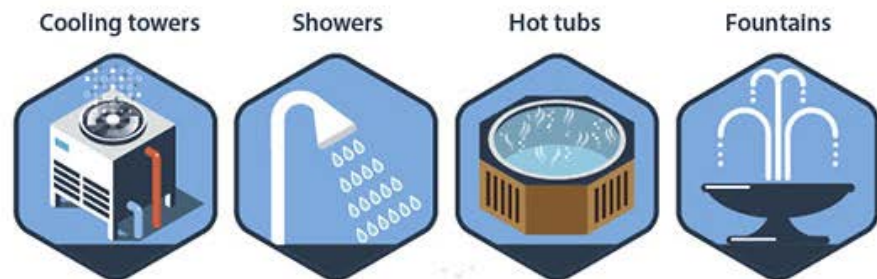
Water temperature fluctuations



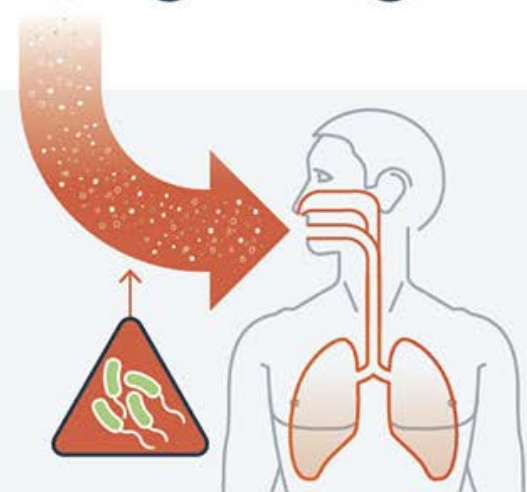
2. *Legionella* grows best in large, complex water systems that are not adequately maintained.



3. Water containing *Legionella* is aerosolized through devices.



4. People can get Legionnaires' disease when they breathe in mist or accidentally swallow water into the lungs containing *Legionella*. Those at increased risk are adults 50 years or older, current or former smokers, and people with a weakened immune system or chronic disease.



www.cdc.gov/legionella

01/12/2018



Health

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Reminder to clean cooling towers to manage exposure to bacteria causing legionnaires' disease

18 May 2020

“There has been an increase in cases of Legionnaires’ disease across the Sydney metropolitan area this autumn ...

“Early symptoms of Legionnaires’ disease can be similar to symptoms of COVID-19 ...”

135 cases, 4 fatalities



Surrey Walmart reopens after legionnaires' disease outbreak



14 cases (7 in ICU), 2 fatalities

Fraser Health Authority confirms 7 cases under investigation; no health risk inside mall, says owner

CBC News · Posted: Sep 07, 2018 2:50 PM PT | Last Updated: September 8, 2018



Cooling Towers

In our experience, the absence of a cooling tower registry created delays in identifying the location of cooling towers to allow a timely investigation of possible sources of cases or outbreaks of legionella. The availability of a cooling tower registry early in our recent investigation would have likely shortened the outbreak duration by two weeks or more. Registration and maintenance requirements under a by-law would strengthen our capacity to ensure that regular inspections and testing of these systems be done and that adequate

Medical Health Officer
Fraser Health

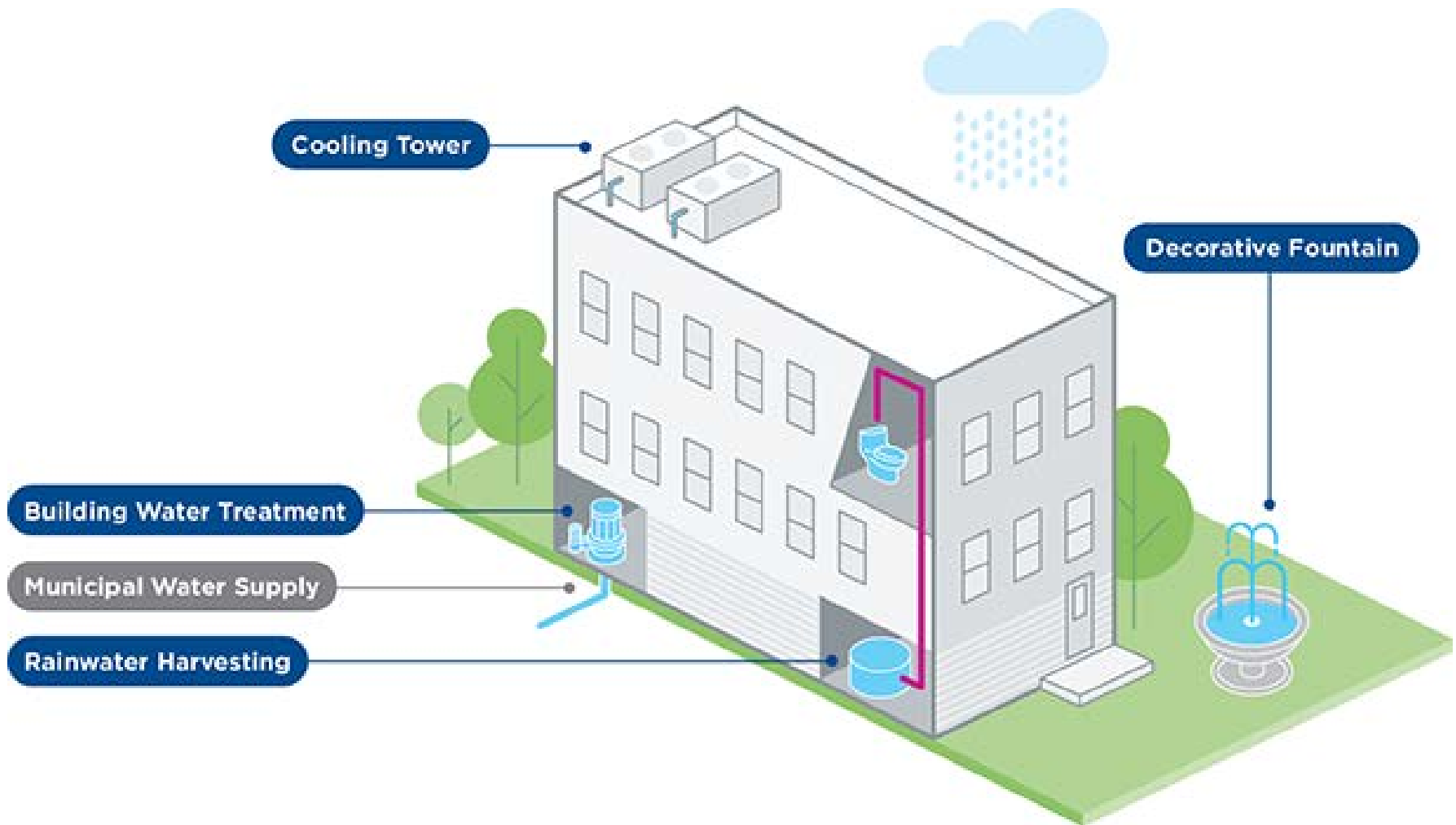
400 – 13450 102nd Avenue
Surrey, BC V3T 0H1
Canada

Tel: (604) 930-5404
Fax: (604) 930-5414
www.fraserhealth.ca



Source: Letter from Dr. Ingrid Tyler, Medical Health Officer and Oonagh Tyson, Regional Director, Health Protection, Fraser Health Authority to Sadhu Johnston, City Manager, City of Vancouver (November 9, 2018). council.vancouver.ca/ctyclerk/cclerk/20181205/documents/cfsc2.pdf

Review — Phase 1: Operating Permits



December 5, 2018 Report (passed unanimously)

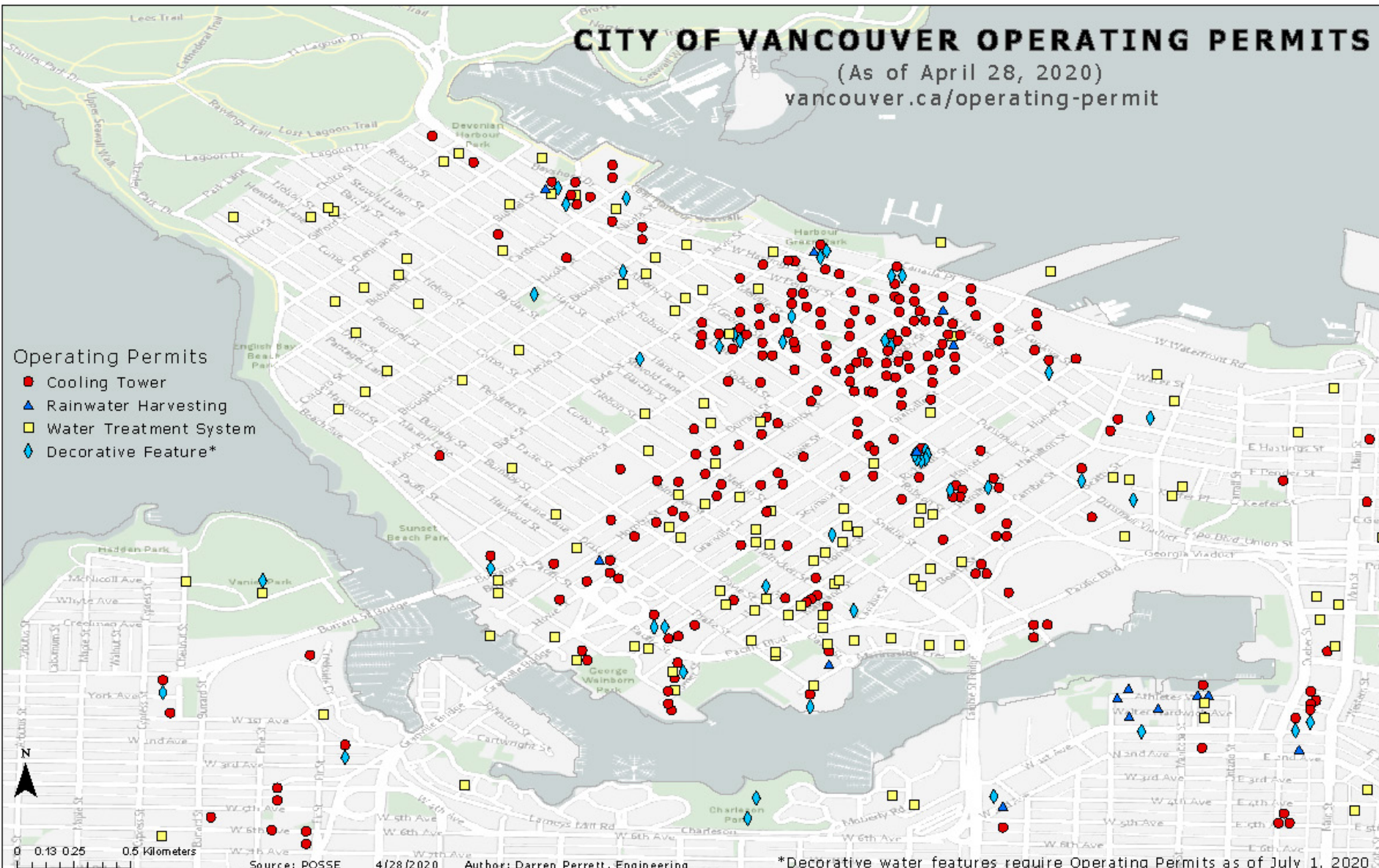
CITY OF VANCOUVER OPERATING PERMITS

(As of April 28, 2020)

vancouver.ca/operating-permit

Operating Permits

- Cooling Tower
- ▲ Rainwater Harvesting
- Water Treatment System
- ◆ Decorative Feature*



Source: POSSE

4/28/2020

Author: Darren Perrett, Engineering

*Decorative water features require Operating Permits as of July 1, 2020



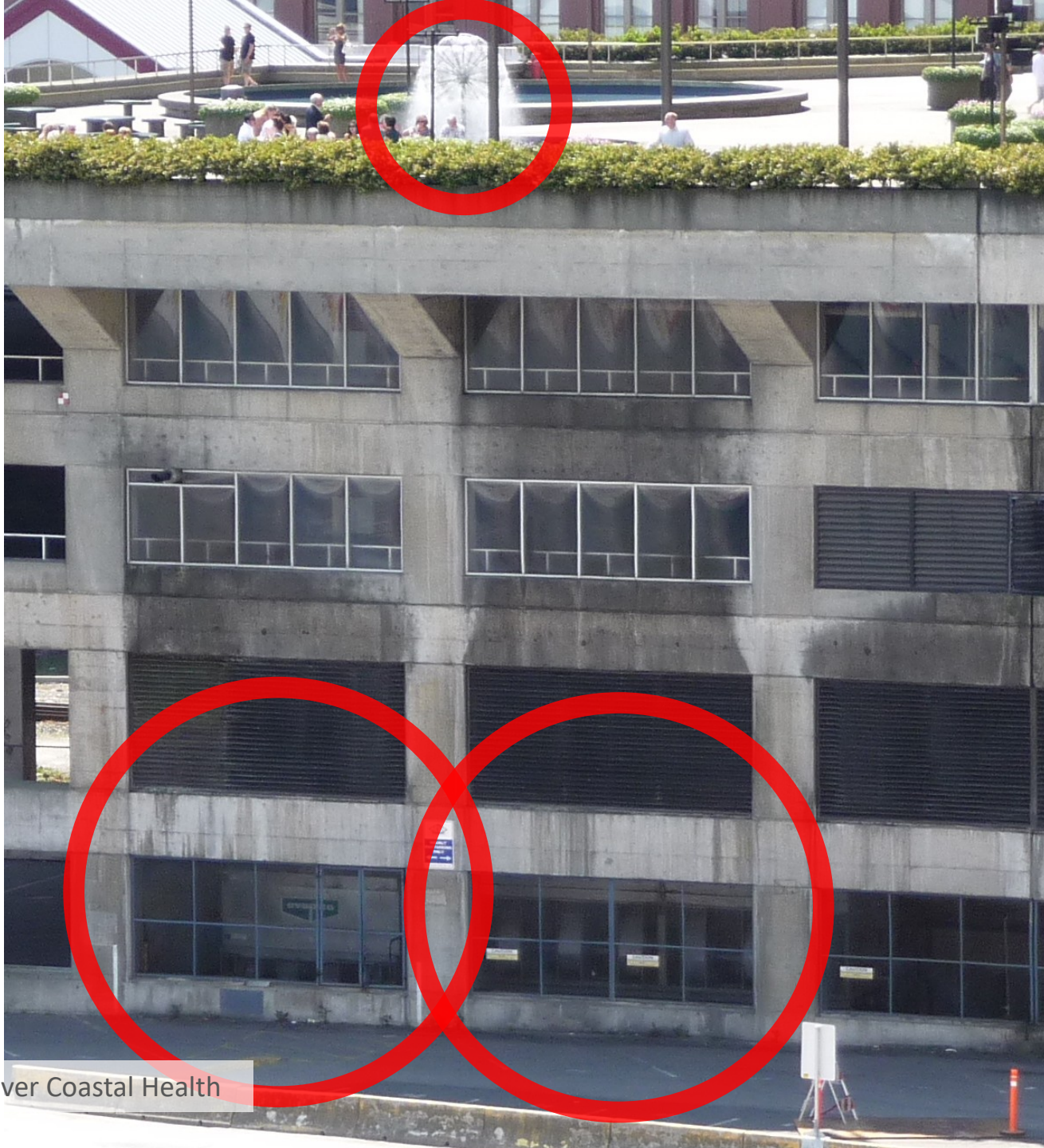
Source: Vancouver Coastal Health



Source: Google Earth



Source: Bolld Real Estate Management, bolldpm.com/properties/river-district-1103-3557-sawmill-crescent-vancouver-bc/111



Source: Vancouver Coastal Health



Source: City of Vancouver



Source: City of Vancouver



Centers for Disease Control and Prevention

CDC 24/7: Saving Lives, Protecting People™

Nationally, water management programs are being implemented but aren't yet widespread, according to Dr. Breyse, who added promising developments include the:

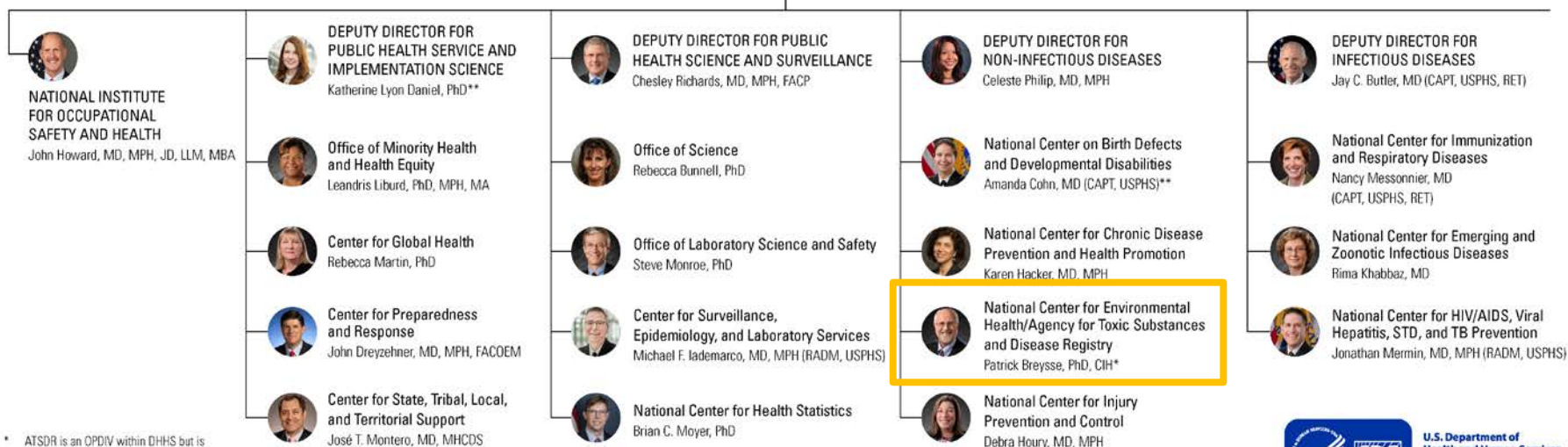
- Centers for Medicare & Medicaid Services June 2017 memo requiring water management plans in hospitals and long-term care facilities
- Cooling tower registry and regulation in New York City and throughout New York state, as well as the potable water regulations in health care facilities in New York state
- Cooling tower and decorative fountain registry in Vancouver, Canada

(September 2019)



CDC Organizational Chart

May 14 2020



* ATSDR is an OPDIV within DHHS but is managed by a common director's office.

** Acting position



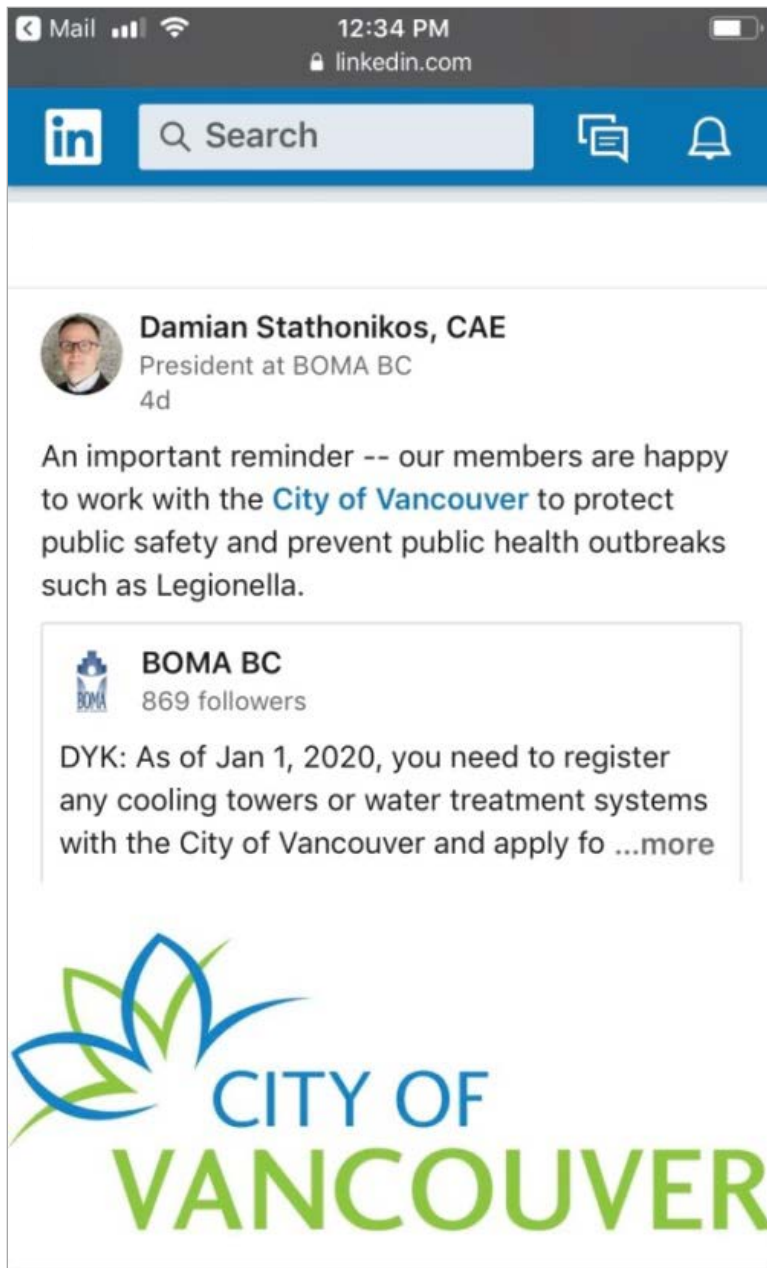
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention



“The City of Vancouver is a true leader
in North America in advancing
public health measures in urban water systems ...”

— Nils Moe, Executive Director, USDN

(March 2020)



(January 2020)

VANCOUVER

Member Enews
Information for members to be in the know

DINE OUT VANCOUVER FESTIVAL

CITY OF VANCOUVER NEW OPERATING PERMITS REQUIRED

As of January 1, 2020, requirements are in effect to register cooling towers, building water treatment systems, and rainwater harvesting systems. This requirement will also apply to decorative water features as of July 1, 2020.

[Permit Information](#)

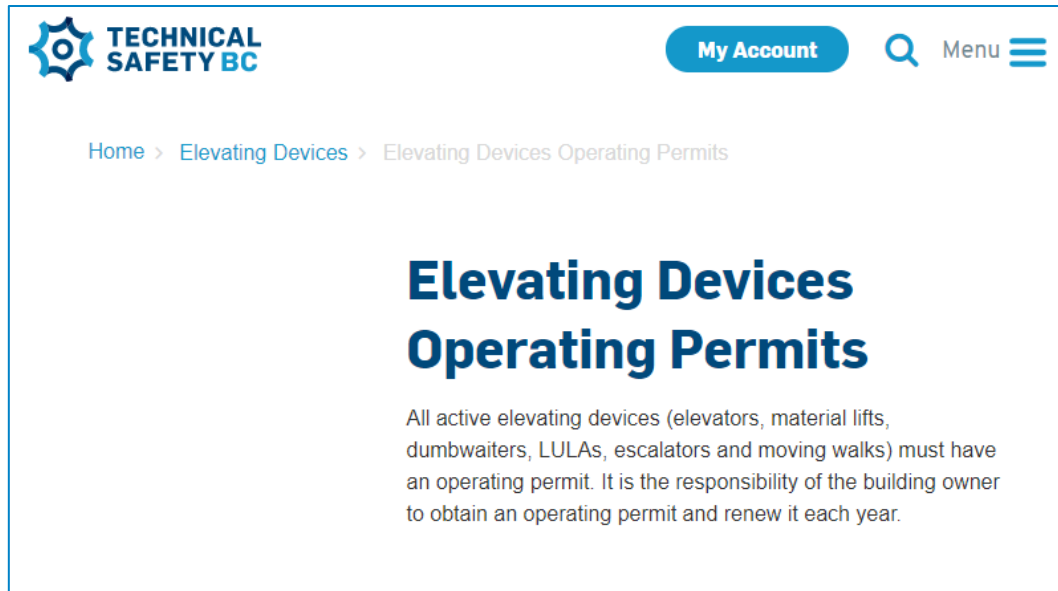
(January 2020)

Cooling Towers

As of **January 1, 2020**, all new & existing cooling towers and evaporative condensers require an *operating permit*.

- vancouver.ca/operating-permit
- Published on the public VanMap (GIS-based).
- *Chief Building Official* to be notified within 30 days of changes.

For comparison:



The screenshot shows the Technical Safety BC website. At the top left is the logo with a gear icon and the text 'TECHNICAL SAFETY BC'. At the top right is a blue button labeled 'My Account', a magnifying glass icon, and the word 'Menu' next to a hamburger menu icon. Below the header is a breadcrumb trail: 'Home > Elevating Devices > Elevating Devices Operating Permits'. The main heading is 'Elevating Devices Operating Permits' in a large, bold, dark blue font. Below the heading is a paragraph of text: 'All active elevating devices (elevators, material lifts, dumbwaiters, LULAs, escalators and moving walks) must have an operating permit. It is the responsibility of the building owner to obtain an operating permit and renew it each year.'

Decorative Features

As of **July 1, 2020**, all new & existing decorative water features require an *operating permit*.

- vancouver.ca/operating-permit
- **Includes:** indoor and outdoor features.
- *Chief Building Official* to be notified within 30 days of changes.
- **Exempt:** single/dual family homes, triplexes, fourplexes and systems with an operating permit under the *BC Pool Regulation*.

Third Person Dead From Legionnaires' Outbreak in Chicago Hotel

Officials tie outbreak to main fountain in lobby of JW Marriott hotel

Published Aug 31, 2012 at 5:46 PM | Updated at 8:41 PM CDT on Sep 1, 2012



114 cases, 3 fatalities

Design

Office of Facilities Planning
Department of Veterans Affairs

Facilities Standards Service
Office of Construction & Facilities Management

CFM

INDOOR WATER FEATURES, DECORATIVE FOUNTAINS: RECOMMEND NON - USE

ISSUE:

Incidents of healthcare-associated infection by *Legionella* bacteria, the causative agent of Legionnaires' disease, have been linked to contaminated interior water features. Patients, visitors, and staff who are immunocompromised are particularly vulnerable and, if infected, can have a high mortality rate ^(1,2,3,4,5).

DISCUSSION:

Recently published articles highlight the risk of indoor water features in healthcare facilities. In one report, an indoor water feature in the lobby of a mid-west US hospital was linked to 8 cases of Legionnaires' disease; none of the 8 cases were inpatients at the facility at the time of exposure and some were visitors that likely just passed by the water feature on their way through the lobby ^(2,4,6). In another report, 2 immunocompromised inpatients developed Legionnaires' disease after exposure to a contaminated water feature in a radiation oncology suite ^(1,8). The fountain had been shut down for 5 months and then operational for 4 months prior to the disease cluster. In both situations, routine maintenance, cleaning and disinfection procedures did not prevent *Legionella* contamination or growth.

CONCLUSION:

Indoor fountains and other water features present a risk in healthcare facilities ^(1,4,6) and should not be included in new VA healthcare interior design solutions. Where these features are currently installed, adaptive reuse of the space for another form of positive healing environment reinforcement should be considered.

ACKNOWLEDGEMENTS:

This Design Alert was developed by a mutual collaborative effort which included the following Participants:

- CFM-Office of Facilities Planning,-Facilities Standards Service
- National Infectious Diseases Service (NIDS).
- National Center for Patient Safety

FOR ADDITIONAL INFORMATION:

Contact Zoltan John Nagy, AIA-NCARB-AAH, Facilities Standards Service at Zoltan.Nagy@va.gov.

(continued)

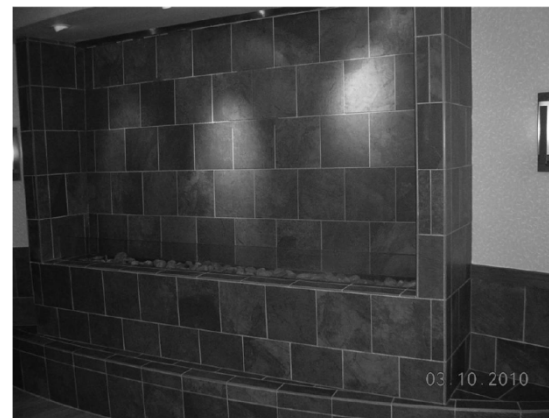
April 19, 2012
003C2B-DA-138



O'Loughlin *et al.* (2007)

BMC Infect Dis 7: 93

18 cases



Haupt *et al.* (2012)

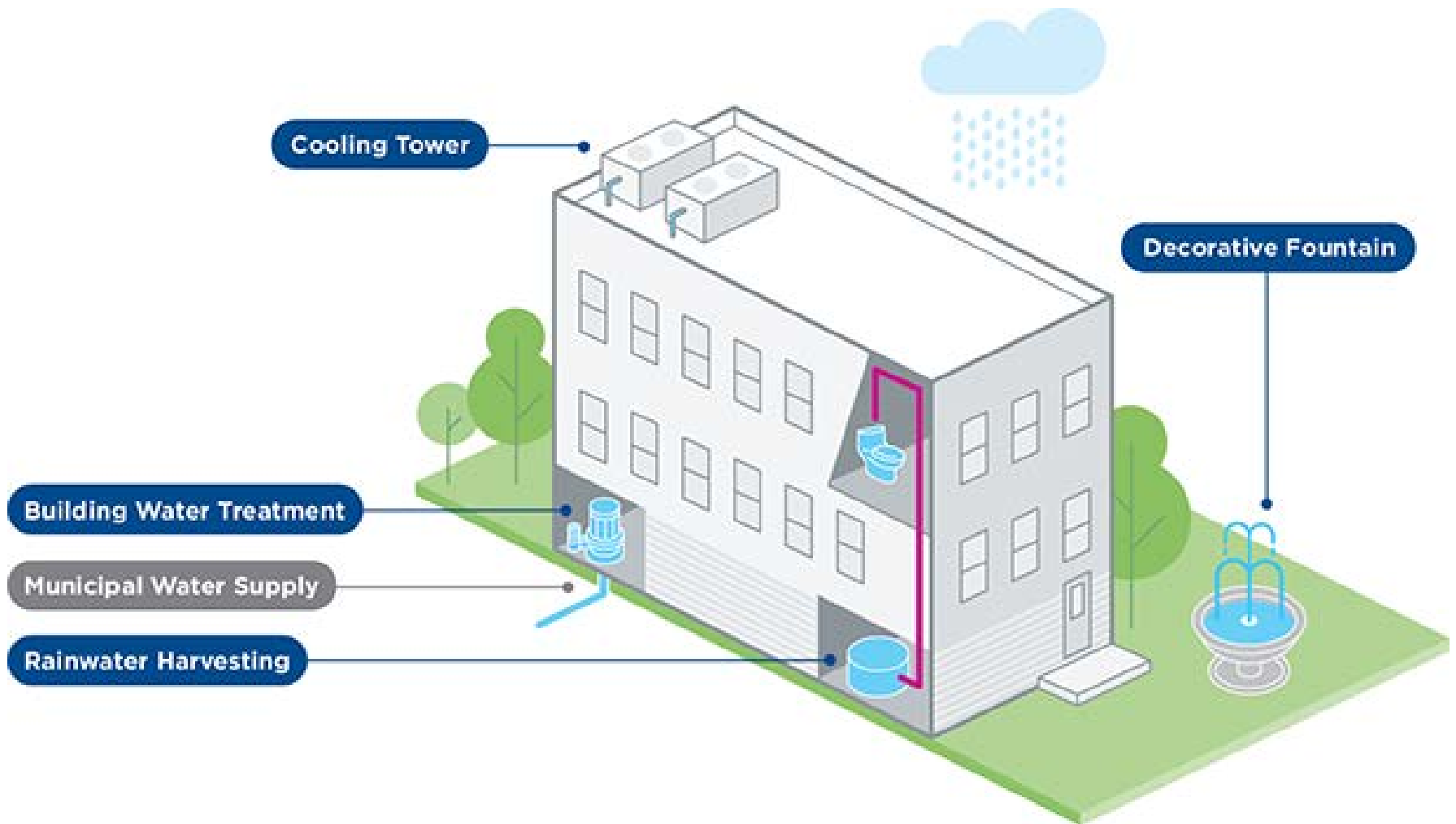
Infect Control Hosp Epidemiol 33: 185

8 cases



Source: City of Vancouver

Phase 2: Pro-active Measures




Cooling Towers

For comparison:

Part 5 — Technical Requirements

Division 1 — All Elevating Devices

Owner's operational and maintenance duties

- 21** (1) An owner must ensure that all new and existing elevating devices are operated in accordance with this regulation and the manufacturer's specifications.
- (2) An owner  must engage a licensed elevating device contractor to maintain a program of mandatory maintenance for the elevating device to ensure its safe working condition.

Proposals for Jan 1, 2021 & Jan 1, 2022

- **Require** a 1 year maintenance contract for new cooling towers.
- **Require** on site maintenance logs.
- **Require** *Legionella pneumophila* testing and reporting.
 - Monthly for cooling towers.
 - Every 2 months for decorative water features and non-potable water systems.
 - Prescribed corrective actions
(harmonised with the federal standard MD 15161 - 2013).
- **Require** a new **Building Water System Operator** certification (Environmental Operators Certification Program).
 - Launching fall 2020
 - 2 day course + exam (water quality, sampling, treatment)
 - Ongoing continuing education requirement



After Coronavirus, Office Workers Might Face Unexpected Health Threats

Stagnant plumbing systems in emptied commercial buildings could put returning employees at risk of Legionnaire's and other illnesses.

By Max Horberry

May 20, 2020, 1:39 p.m. ET

When you finally return to work after the lockdown, coronavirus might not be the only illness you need to worry about contracting at the office.

Lead

Health Canada **maximum** in drinking water: 5 ppb

West End Community Ctr: Little Sprout Preschool, kitchen tap: **17** ppb

Vancouver Aquatic Ctr: Pool deck, drinking fountain: **>100** ppb

- Internal
- External Deliverables (outside agencies):
 - Special events guidelines (VCH)
 - Post-COVID-19 advisory (VCH & City, WorkSafe BC, others)

Preprint. Version Uploaded April 8, 2020

Considerations for Large Building Water Quality after Extended Stagnation

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12 **Acknowledgement**

13 The authors appreciate insights provided by Pete Demarco (IAPMO), Billy Smith (ASPE), Dr.
14 David Dyjack (NEHA), Dr. Sheldon Masters (ESPRI), Élise Deshommes (Polytechnique
15 Montreal), Elizabeth Montagnino and Kyungyeon Ra (Purdue University), and Chris Radziminski
16 and Phil White (City of Vancouver). Feedback provided by several other public health and water
17 utility professionals is also appreciated.

Conclusion & Acknowledgements

- Health Authorities:
 - Vancouver Coastal Health (Randy Ash, Shelley Beaudet, Linda Dix-Cooper, [Arne Faremo](#), Jessica Ip, David Jantzen, Emily Peterson, [Michael Schwandt](#), Michael Wu)
 - BC Centre for Disease Control (Eleni Galanis, Linda Hoang, Natalie Prystajek, Christine Tchao, Esther Tong, Frankie Tsang)
 - U.S. Centers for Disease Control & Prevention (Laura Cooley, Claressa Lucas)
 - New York City Department of Health & Mental Hygiene (Christopher Boyd)
- City of Vancouver (Kimberley Beck, Darren Perrett)
- Public Services and Procurement Canada (Jeff Moffat)
- Granting Agencies & Funding:
 - Urban Sustainability Directors Network (Peer-Exchange Grant, Innovation Fund Grant)
 - NSF International (Alextia Armstrong, Christopher Boyd, Jason George, Dann Holmes, Robert Murphy, Andrew Ward)
 - Federation of Canadian Municipalities (Green Municipal Fund)