BACKFLOW PREVENTION PROGRAM

TORONTO WATER:
ENVIRONMENTAL MONITORING & PROTECTION

An Overview Of Toronto's Program Dedicated To
Protecting Our Potable Water Systems

Topics

- Background
- What Is Backflow? Backpressure? Backsiphonage?
- Property Types – ICIs and Multi-residential
- Hazard Categories
- Schedule 5 & Compliance Deadlines
- Premise Isolation and BFP Device Testing
- Fire System Protection
- Surveying a Facility
- Device Installation & Building Permits
- Certified Tester/Installer/Surveyor Documents & Schedule 6
- Device Testing, Test Reports, & Device Tags
- Responsibility of the Owner
- FAQ
- How to Contact the City

Background

- In 1998, 6 municipalities amalgamated as one city, which created the need for one by-law to protect the new City Of Toronto.

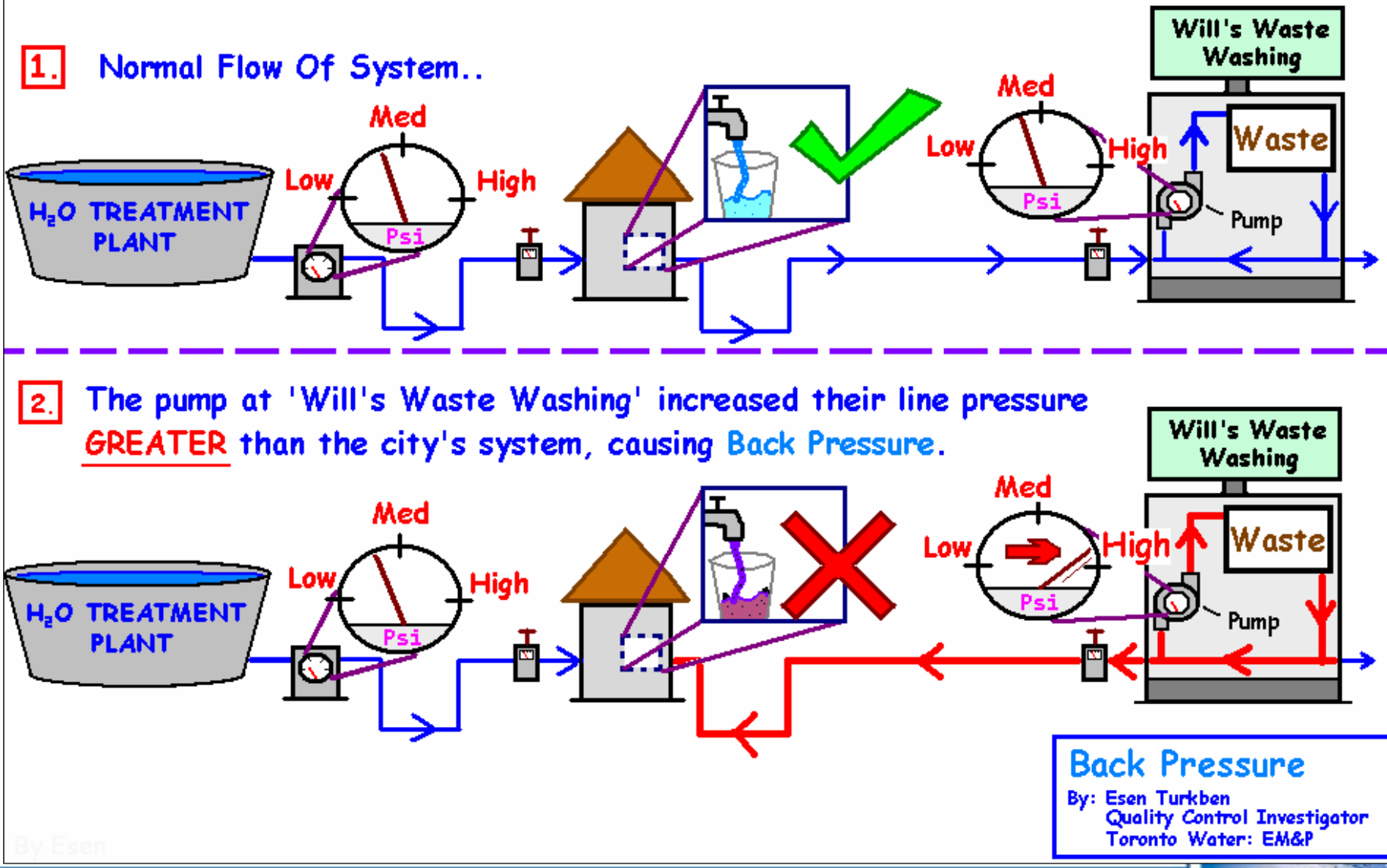
- After the Walkerton water pollution tragedy, The MOE ***Safe Drinking Water Act*** greatly influenced the direction of our Water Supply Bylaw – "..municipalities to take all reasonable approach to protect water supply".

What Is Backflow?

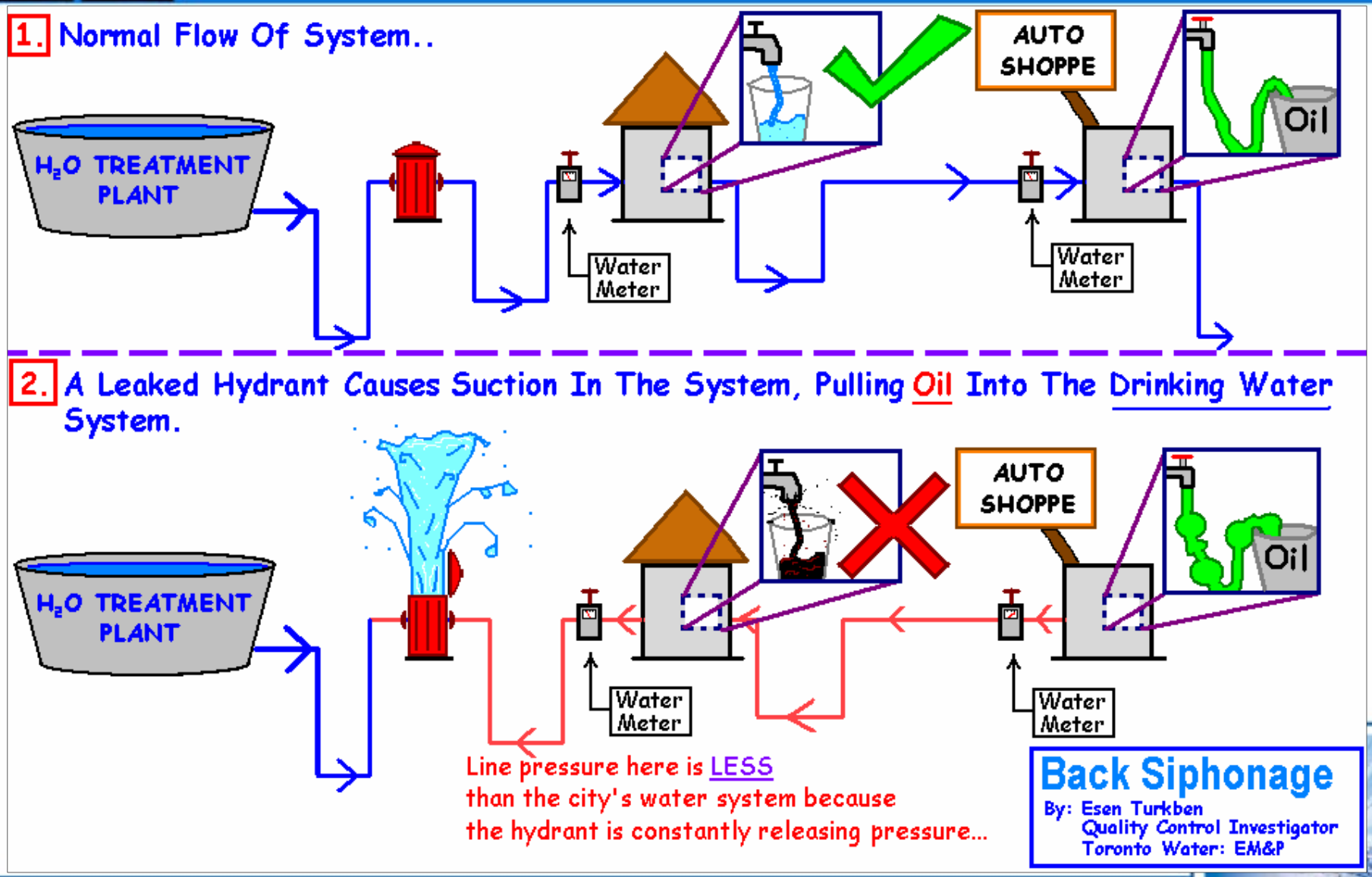
- Backflow is the undesired reversal of water flow against normal direction.

- **Backflow** occurs as a result of Back Pressure or Back Siphonage.
  - Back Pressure occurs when the pressure in a private water system is *greater* than the pressure in the City's water supply system.
  - Back Siphonage occurs when the pressure in the water supply-system is lower than a private-systems' pressure. This can result in the reversal of flow between the public and private system.

Back Pressure



Back Siphonage



Property Types
ICIs and Multi-residential

- **Industrial** – Factory, plant or facility of manufacturing (meat processing, auto-parts production, metal plating)
- **Commercial** – Retail facility (mall, hair salon)
- **Institutional** – Educational facility (university, college, school, hospital)
- **Multi-Residential** – All housing with 5 or more units

Hazard Categories

- Toronto based its BFP Program on the Canadian Standard Association (CSA) B64 Backflow Prevention Standard.
- The backflow hazard levels in ICI and multi-residential properties can be classified as:
  - Severe Hazard Creating a danger to health.
  - Moderate Hazard Aesthetic qualities have been reduced and under certain conditions can create a danger to health.
  - Low Hazard Nuisance that can only reduce the aesthetic qualities of water.

Schedule 5 & Compliance Deadlines

Schedule 5 in the By-law lists the industry sectors and associated backflow hazard levels…

TORONTO MUNICIPAL CODE
WATER SUPPLY

SCHEDULE 5 TO CHAPTER 851
BACKFLOW PREVENTION DEVICE FOR PREMISE ISOLATION
INSTALLATION DATES BASED ON INDUSTRY SECTOR
[Amended 2008-12-03 by By-law No. 1250-2008]

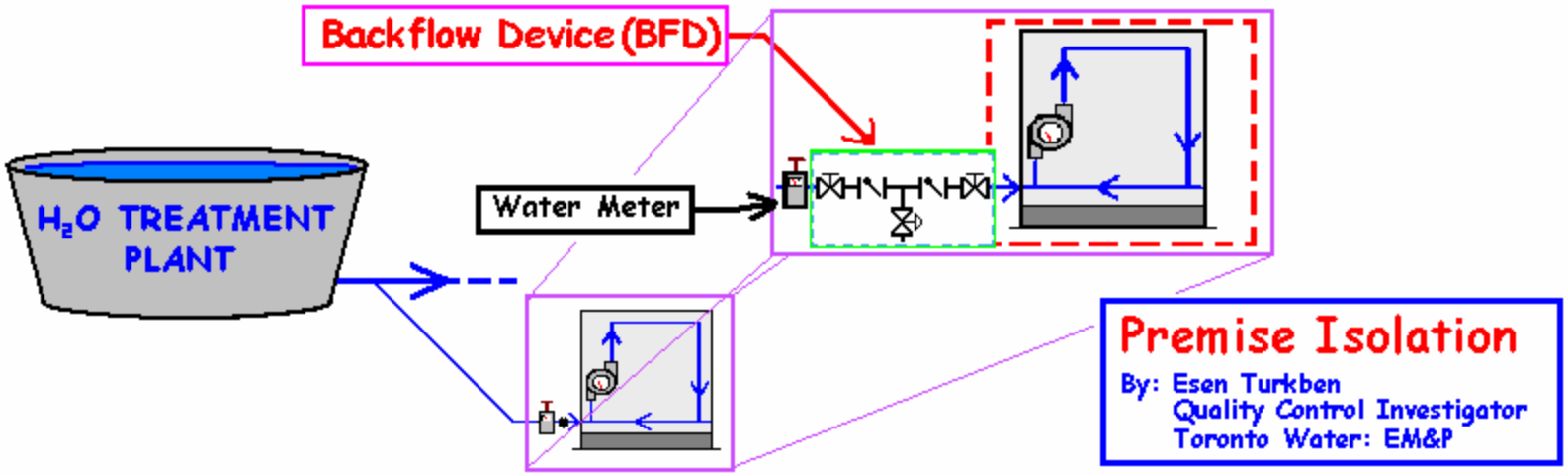
Industry Sector	Hazard Level	Installed By
Aircraft Manufacturing	Severe	December 31, 2008
All Printing Industry (excluding dry digital printing)	Severe	December 31, 2008
Automobile Manufacturing	Severe	December 31, 2008
Beverage Manufacturing	Severe	December 31, 2008
Breweries	Severe	December 31, 2008
Car Washes	Severe	December 31, 2008
Chemical Manufacturing	Severe	December 31, 2008
Cosmetic Product Manufacturing	Severe	December 31, 2008
Distilleries	Severe	December 31, 2008
Dry Cleaners	Severe	December 31, 2008

TORONTO MUNICIPAL CODE
WATER SUPPLY

Industry Sector	Hazard Level	Installed By
Apartment Buildings (five units or more, with shared single-service connection)	Moderate	June 30, 2009
Commercial Premises (excluding dry retail operations)	Moderate	June 30, 2009
Fire Stations	Moderate to Severe	June 30, 2009
Funeral Homes/Cemetery	Moderate to Severe	June 30, 2009
Golf Courses	Moderate to Severe	June 30, 2009
Hotel & Motel	Moderate	June 30, 2009
Schools (elementary, junior high, senior high)	Moderate	June 30, 2009

Premise Isolation

- **Premise Isolation:** is the isolation of water located within a building, structure or property from the waterworks or water supply.



- Toronto allows two types of premise isolation devices to be installed:

  - For a Severe Hazard: a Reduced Pressure Principle Assembly (RP).

  - For a Moderate Hazard: a Double Check Valve Assembly (DCVA).

BFP Device Testing

- **BFP Devices shall be:**
  - Tested upon first installation
  - Annually
  - Tested upon cleaning, relocating, repairing & servicing

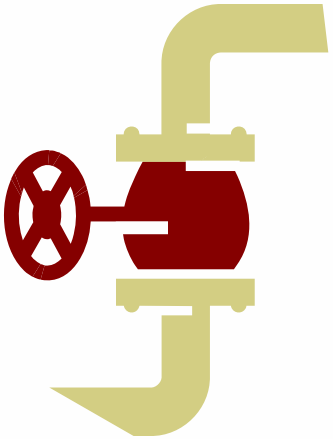
- Test reports shall be submitted by **the Owner** to the City within 7 days.

- Tests shall be conducted by an *Authorized Person* on a city designated form, available on our website.

Fire System Protection

• A Fire System, for the purposes of this By-Law, should only be addressed if…

➢ There is anti-freeze, foam injection, and/or other *chemical additives*.



➢ If a Fire System is connected to any auxiliary water sources.

Surveying A Facility

- **The forms can be downloaded at:**
  http://www.toronto.ca/water/protecting_quality/backflow_prevention/forms.htm

TORONTO Water

Backflow Prevention Survey Report

Environmental Monitoring & Protection Unit - 30 Dee Avenue, Toronto, Ontario M4N 1B8 - Fax: 416-394-6718 * - E-Mail - backflow@toronto.ca

1. To be Submitted by the Property Owner of an Industrial, Commercial, Institutional, or Multi-Residential facility which has MORE THAN ONE water service connection, or as required by the General Manager.
2. This Backflow Prevention (BFP) survey form is for PREMISE ISOLATION ONLY.
3. All backflow prevention devices shall be located downstream of the water meter unless otherwise authorized by the General Manager.
4. All bypass or parallel arrangements must have the same level of protection as the main water service line which is being bypassed.
5. A City Of Toronto building permit number is required for any installations or modifications made to a facilities plumbing system.
6. This survey must be conducted by an Authorized Person under City of Toronto Water Supply By-law, Municipal Code Chapter § 851-93 (Schedule G). An Authorized Person must prove their qualification by submitting copies of their required documentation to the City Of Toronto.

Facility Address:	Facility Postal Code:	Property Owner Name:	Owner E-mail:
Owner Phone Number:	Owner Fax Number:	Property Owner Address:	Owner Postal Code:

The Number Of City Of Toronto Water Service Connections At This Facility:

What Is The Top Floor Static Water Pressure?

Facility Type: ☐ Industrial ☐ Commercial ☐ Institutional ☐ Multi - Residential

Property Type (As per Schedule 5):

Please Provide A System Sketch (As Many As Needed) At The End Of This Survey. Include All Piping & Devices Such As: Multiple City Of Toronto Water Meter's, Branch Connection's, Hose Connection's, Split's, Or Multiple BFP Devices For Premise Isolation.

Please complete for each Water Service Connection:

Service Connection 1 BFP1

Service Connection Use:	Location of Service Connection:	Size of Service Line (Diameter):	Water Meter Serial #: / Water Meter Account #:	The Water Meter Account # Can Be Found On Any Water Bill Payments.
Hazard Classification:	Is a BFP Device Installed? (If No, please provide a recommendation for the type of device required, along with the make and model.) ☐ Yes ☐ No	Is There A Branch Connection, Hose Connection, Or A Split Between The Water Meter & The BFP Device? ☐ Yes ☐ No	Is the BFP Device Installed After The Water Meter? ☐ Yes ☐ No	Physical Condition of the BFP Device: ☐ Good ☐ Leaking ☐ Damaged
(Fire System's Only) Is There Foam or Chemical Addition? ☐ Yes ☐ No	Type of BFP Device:	Manufacturer:	Model: / Serial #:	BFP Device Size: / Orientation of the BFP Device: ☐ Horizontal ☐ Vertical
Is There a Detector Check Valve? ☐ Yes ☐ No	Does the location where the BFP Device is installed have adequate drainage? ☐ Yes ☐ No	If Applicable, Please provide a recommended date for the installation of the device (YYYY/MM/DD):	Is there a BFP device installed in parallel? If yes, please provide the details of the BFP below. ☐ No ☐ Yes	
Is there a Bypass for the meter? ☐ Yes ☐ No / Is there a Water System Drain at the Meter? ☐ Yes ☐ No	Remarks:			

Service Connection 1 BFP2

Type of BFP Device:	Manufacturer:	Model:	Serial #:	BFP Device Size:	Remarks:

Service Connection 2 BFP1

Service Connection Use:	Location of Service Connection:	Size of Service Line (Diameter):	Water Meter Serial #: / Water Meter Account #:	The Water Meter Account # Can Be Found On Any Water Bill Payments.
Hazard Classification:	Is a BFP Device Installed? (If No, please provide a recommendation for the type of device required, along with the make and model.) ☐ Yes ☐ No	Is There A Branch Connection, Hose Connection, Or A Split Between The Water Meter & The BFP Device? ☐ Yes ☐ No	Is the BFP Device Installed After The Water Meter? ☐ Yes ☐ No	Physical Condition of the BFP Device: ☐ Good ☐ Leaking ☐ Damaged
(Fire System's Only) Is There Foam or Chemical Addition? ☐ Yes ☐ No	Type of BFP Device:	Manufacturer:	Model: / Serial #:	BFP Device Size: / Orientation of the BFP Device: ☐ Horizontal ☐ Vertical
Is There a Detector Check Valve? ☐ Yes ☐ No	Does the location where the BFP Device is installed have adequate drainage? ☐ Yes ☐ No	If Applicable, Please provide a recommended date for the installation of the device (YYYY/MM/DD):	Is there a BFP device installed in parallel? If yes, please provide the details of the BFP below. ☐ No ☐ Yes	
Is there a Bypass for the meter? ☐ Yes ☐ No / Is there a Water System Drain at the Meter? ☐ Yes ☐ No	Remarks:			

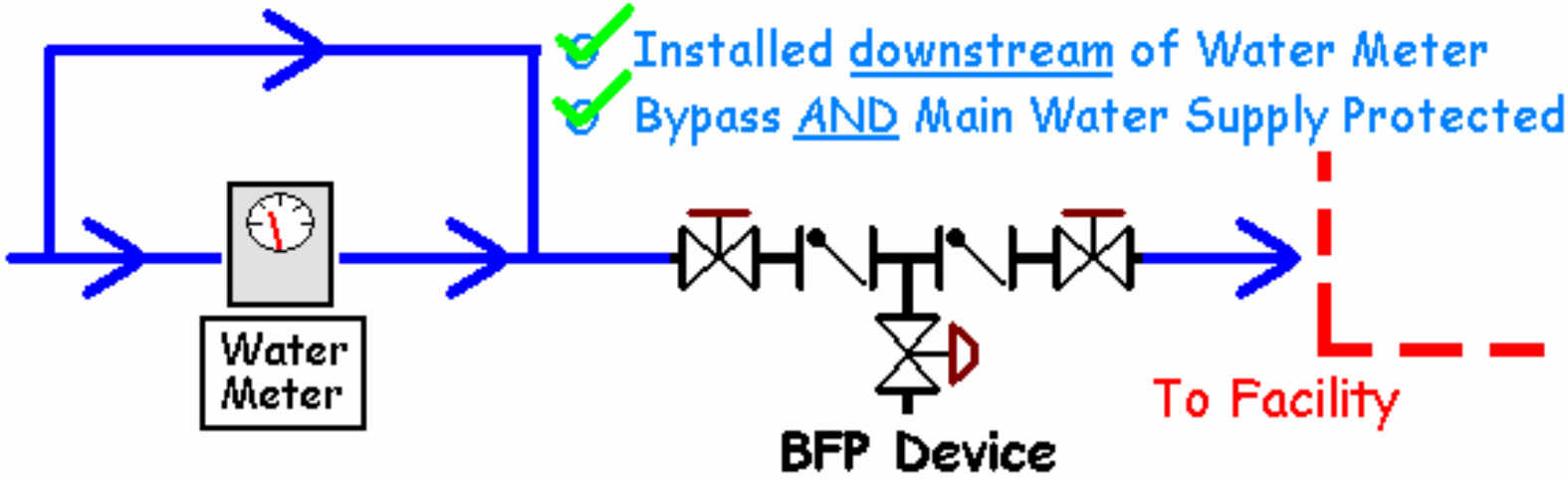
Service Connection 2 BFP2

Type of BFP Device:	Manufacturer:	Model:	Serial #:	BFP Device Size:	Remarks:

Last Revised: June 2010 Page 1 of 3 * Sending personal information by fax is not a secure means of transmission

BFP Device Installation

- Premise isolation backflow prevention devices should be installed in compliance with Building Code Act, CSA B64 Series Standard and manufacturer specifications.
- A City of Toronto **Building Permit** is Required.
- The device should be installed <u>downstream</u> of the water meter.



Building Permits

Permits can only be obtained over the counter at one of the four building division locations, depending on where the work is being done in the City...

Toronto City Hall *100 Queen Street West* *416-392-7539*	*North York Civic Centre* *5100 Yonge Street* *416-395-7000*
Etobicoke *2 Civic Centre Court* *416-394-8002*	*Scarborough Civic Centre* *150 Borough Drive* *416-396-7526*

Tester Documents

A comprehensive list of requirements can be found at…

http://www.toronto.ca/water/protecting_quality/backflow_prevention/testers.htm

Some of the key documents include:

- City of Toronto Business License
- The Plumbers License
- The OWWA CCCS, or Equivalent
- Test Kit Calibration Certificate (valid within one year)


Schedule 6 in the by-law

The Schedule 6 in the By-law lists persons who are qualified/authorized to conduct backflow prevention survey and device testing.

Item	Function	Professional Engineer with CCCS Certification	Certified Engineering Technologist with CCCS Certification *	Licensed Master Plumber with contractor's licence and with CCCS Certification	Journeyman Plumber with CCCS Certification †	Apprentice plumber with CCCS Certification ‡	Fire system sprinkler fitter with CCCS Certification	Industrial Millwright with CCCS Certification	Irrigation System Installer with CCCS Certification
1	Carry out cross-connection / backflow prevention device survey	V	V	V	V				
2	Install, relocate, or replace backflow prevention device			V	V	V			
3	Repair backflow prevention device	V	V	V	V	V			
4	Test backflow prevention device	V	V	V	V	V	V	V	V
5	Complete Items 1, 2, 3, and 4 in relation to fire protection systems	V	V	V	V	V	V		
6	Complete Items 3 and 4 in relation to lawn sprinkler systems	V	V	V	V	V			

V	*Authorized to perform function.*
*	*Required to be under the direction of a Professional Engineer*
†	*Required to be employed by a licensed plumbing contractor*
‡	*Required to be employed by a licensed plumbing contractor and under the direct supervision of a journeyman plumber or master plumber*
CCCS	Cross Connection Control Specialist, Note: **Please refer to § 851-8.F for the criteria for acceptable CCCS Certification**

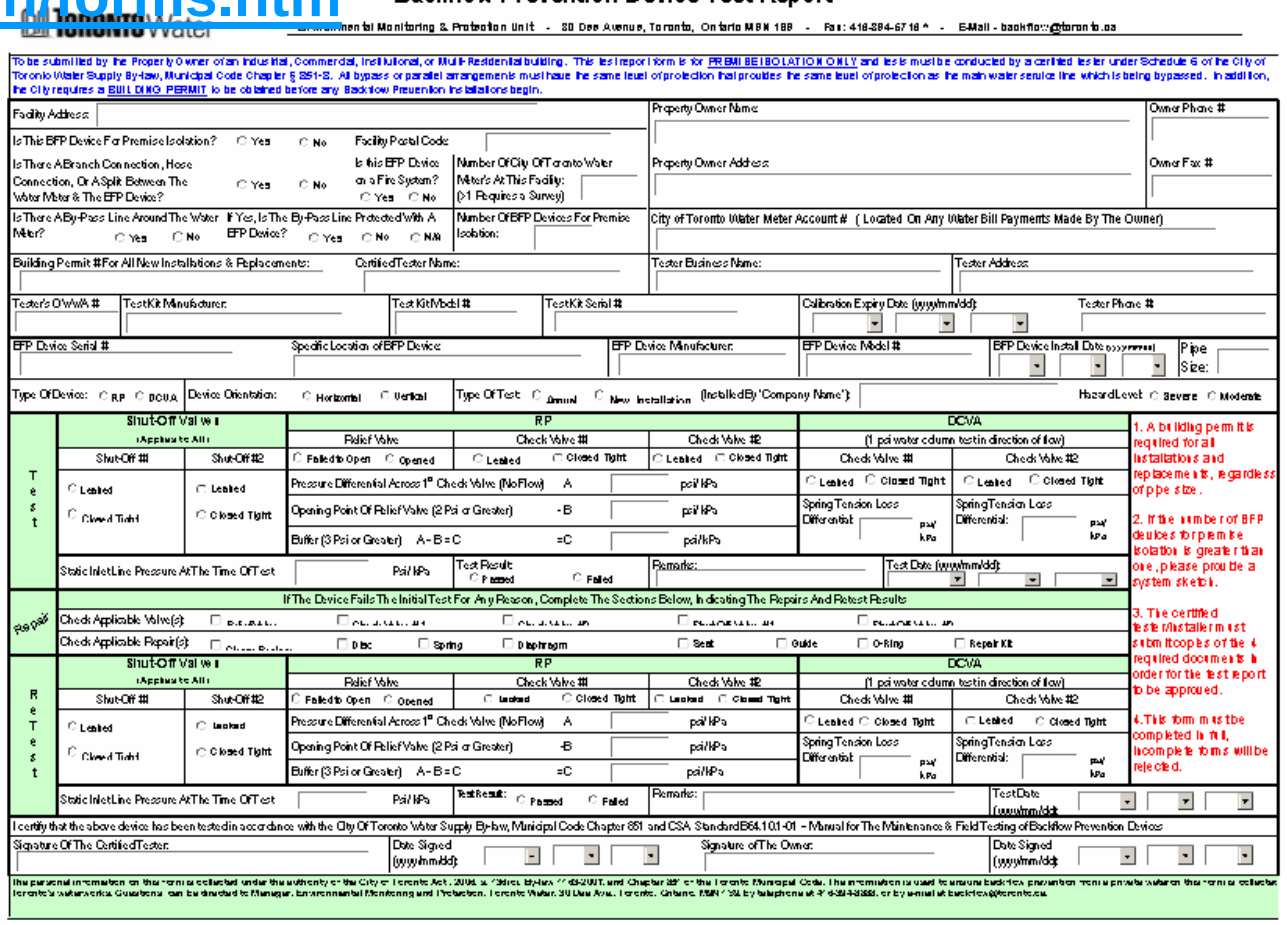
Test Reports

Test report acceptance Criteria:

- Is the test report complete?
  - E.g. Owners information, test date, Signature of owner etc
- Is the information Accurate?
- Has the tester provided all of his required documents?

Test Reports (part 2)

- **The forms can be downloaded at:**
  http://www.toronto.ca/water/protecting_quality/backflow_prevention/forms.htm



Backflow Prevention Device Test Report

Environmental Monitoring & Protection Unit - 30 Dee Avenue, Toronto, Ontario M8N 1B8 - Fax: 416-394-6718 - E-Mail - backflow@toronto.ca

To be submitted by the Property Owner of an Industrial, Commercial, Institutional, or Multi-Residential building. This test report form is for PREMISE ISOLATION ONLY and test is must be conducted by a certified tester under Schedule 6 of the City of Toronto Water Supply By-law, Municipal Code Chapter § 851-8. All bypass or parallel arrangements must have the same level of protection that provides the same level of protection as the main water service line which is being bypassed. In addition, the City requires a BUILDING PERMIT to be obtained before any Backflow Prevention Installations begin.

Facility Address | Property Owner Name | Owner Phone #
Is This BFP Device For Premise Isolation? Yes No | Facility Postal Code | Property Owner Address | Owner Fax #
Is There A Branch Connection, Hose Connection, Or A Split Between The Water Meter & The BFP Device? Yes No | Is this BFP Device on a Fire System? Yes No | Number Of City Of Toronto Water Meters At This Facility: (>1 Requires a Survey)
Is There A By-Pass Line Around The Water Meter? Yes No | If Yes, Is The By-Pass Line Protected With A BFP Device? Yes No N/A | Number Of BFP Devices For Premise Isolation: | City of Toronto Water Meter Account # (Located On Any Water Bill Payments Made By The Owner)
Building Permit # For All New Installations & Replacements: | Certified Tester Name: | Tester Business Name: | Tester Address:
Tester's OWWA # | Test Kit Manufacturer: | Test Kit Model # | Test Kit Serial # | Calibration Expiry Date (yyyy/mm/dd): | Tester Phone #
BFP Device Serial # | Specific Location of BFP Device: | BFP Device Manufacturer: | BFP Device Model # | BFP Device Install Date (yyyy/mm/dd) | Pipe Size:
Type Of Device: RP DCVA | Device Orientation: Horizontal Vertical | Type Of Test: Annual New Installation (Installed By 'Company Name'): | Hazard Level: Severe Moderate

Test	Shut-Off Valve (Applicable All)		RP			DCVA	
	Shut-Off #1	Shut-Off #2	Relief Valve	Check Valve #1	Check Valve #2	(1 psi water column test in direction of flow) Check Valve #1	Check Valve #2
	Leaked / Closed Tight	Leaked / Closed Tight	Failed to Open / Opened	Leaked / Closed Tight	Leaked / Closed Tight	Leaked / Closed Tight	Leaked / Closed Tight
			Pressure Differential Across 1st Check Valve (No Flow) A	psi/kPa		Spring Tension Loss Differential: psi/kPa	Spring Tension Loss Differential: psi/kPa
			Opening Point Of Relief Valve (2 Psi or Greater) -B	psi/kPa			
			Buffer (3 Psi or Greater) A - B = C =C	psi/kPa			
	Static Inlet Line Pressure At The Time Of Test: psi/kPa		Test Result: Passed Failed	Remarks:		Test Date (yyyy/mm/dd):	

Repair — If The Device Fails The Initial Test For Any Reason, Complete The Sections Below, Indicating The Repairs And Retest Results

Check Applicable Valve(s): [illegible] | Check Applicable Repair(s): [illegible] Disc Spring Diaphragm Seat Guide O-Ring Repair Kit

Re-Test	Shut-Off Valve (Applicable All)		RP			DCVA	
	Shut-Off #1	Shut-Off #2	Relief Valve	Check Valve #1	Check Valve #2	(1 psi water column test in direction of flow) Check Valve #1	Check Valve #2
	Leaked / Closed Tight	Leaked / Closed Tight	Failed to Open / Opened	Leaked / Closed Tight	Leaked / Closed Tight	Leaked / Closed Tight	Leaked / Closed Tight
			Pressure Differential Across 1st Check Valve (No Flow) A	psi/kPa		Spring Tension Loss Differential: psi/kPa	Spring Tension Loss Differential: psi/kPa
			Opening Point Of Relief Valve (2 Psi or Greater) -B	psi/kPa			
			Buffer (3 Psi or Greater) A - B = C =C	psi/kPa			
	Static Inlet Line Pressure At The Time Of Test: psi/kPa		Test Result: Passed Failed	Remarks:		Test Date (yyyy/mm/dd):	

1. A building permit is required for all installations and replacements, regardless of pipe size.
2. If the number of BFP devices for premise isolation is greater than one, please provide a system sketch.
3. The certified tester/installer must submit copies of the 4 required documents in order for the test report to be approved.
4. This form must be completed in full, incomplete forms will be rejected.

I certify that the above device has been tested in accordance with the City Of Toronto Water Supply By-law, Municipal Code Chapter 851 and CSA Standard B64.10.1-01 - Manual for the Maintenance & Field Testing of Backflow Prevention Devices

Signature Of The Certified Tester: | Date Signed (yyyy/mm/dd): | Signature of The Owner: | Date Signed (yyyy/mm/dd):

The personal information on this form is collected under the authority of the City of Toronto Act, 2006, s. 8 [illegible] and Chapter 851 of the Toronto Municipal Code. The information is used to ensure backflow prevention requirements are met. This form is collected by Toronto Water. Questions can be directed to Manager, Environmental Monitoring and Protection, Toronto Water, 30 Dee Ave., Toronto, Ontario, M8N 1B8 by telephone at 416-394-8888, or by email at backflow@toronto.ca

Last Revised: May 2010 — Page 1 of 1 — *Sending personal information by fax is not a secure means of transmission

Test Reports (part 3)

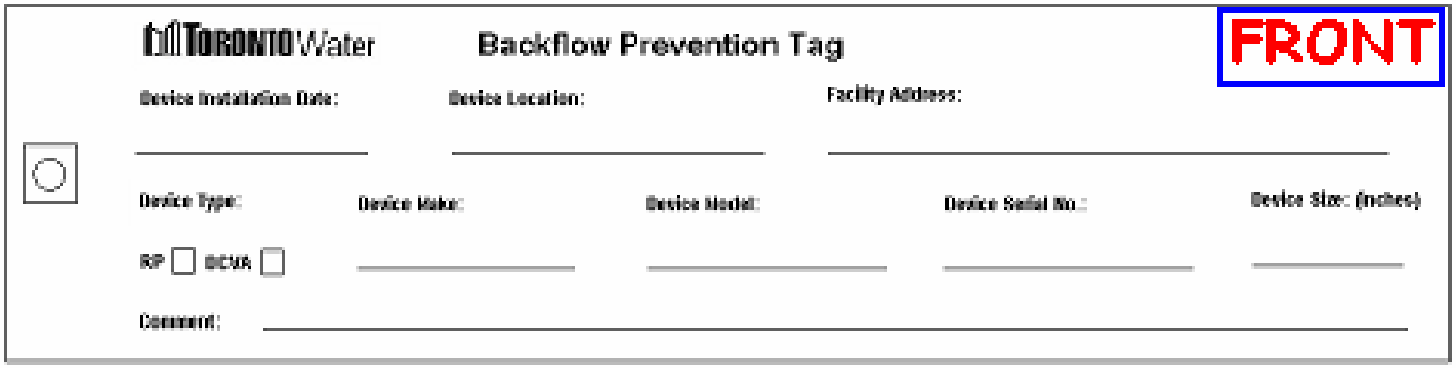
Submissions can be done by:

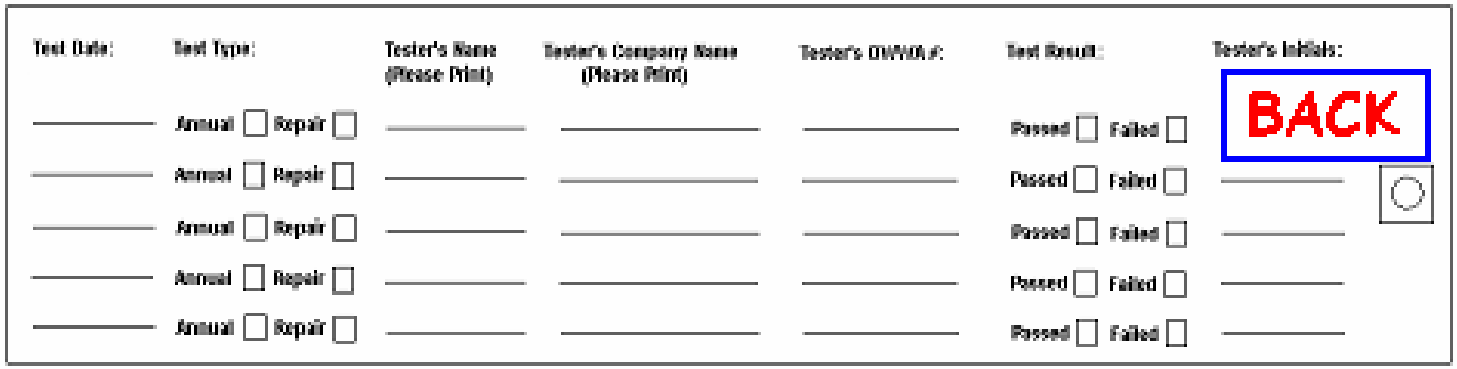
1) email to backflow@toronto.ca
2) Faxed to 416-394-5716
3) Mailed to:

Backflow Prevention Program
Environmental Monitoring & Protection
Toronto Water
30 Dee Avenue, Toronto, Ontario
M9N 1S9

Device Tags

- A Sample Device Tag Has Been Provided. This Can Be Found At: http://www.toronto.ca/water/protecting_quality/backflow_prevention/forms.htm
- Testers/Installers are encouraged to personalize these tags, without losing any of the original information.





Device Tags (part 2)

- Premise isolation backflow prevention devices shall be legibly marked with:
  - The address of the property and location
  - Device type and installation date
  - Manufacturer, serial number and size
  - Test Date, Tester's initials, printed name, certificate #, and tester's employer name

- All piping between the water meter and the premise isolation backflow prevention devices is clearly labelled "**No connection permitted**".

Responsibility of Property Owner

- Submit Survey (if required).
- Plumbing building permit.
- Installation by an Authorized Person (see schedule 6).
- Get the device Tested by a Certified Tester.
- Contact the building division to request final inspection by the plumbing inspector, in order to close the permit.
- Submit a copy of the test report to Toronto Water and keep another copy for your records.

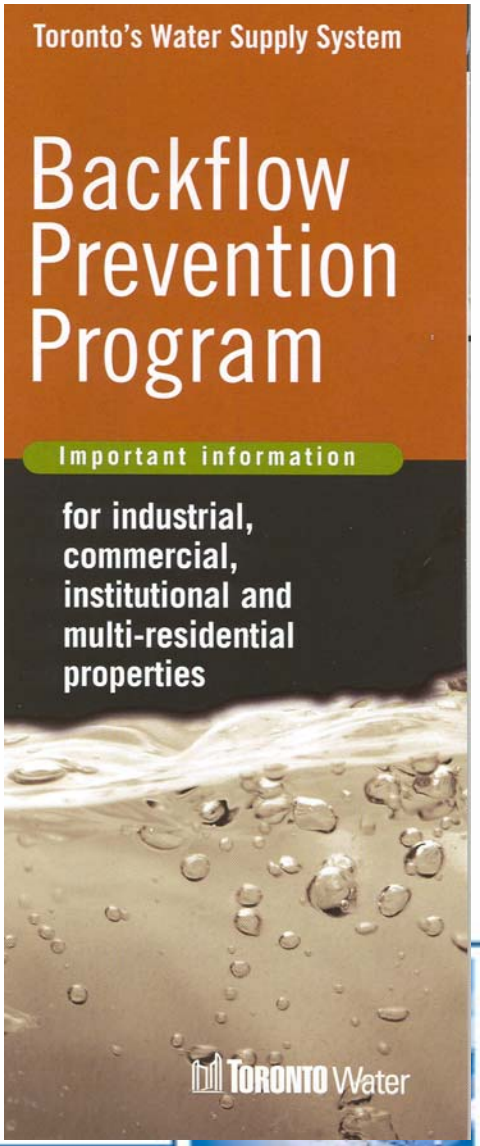
BFP Brochure

- The Backflow Prevention Brochure provides information of the City of Toronto's Backflow Prevention Program

- To obtain a copy of the brochure:

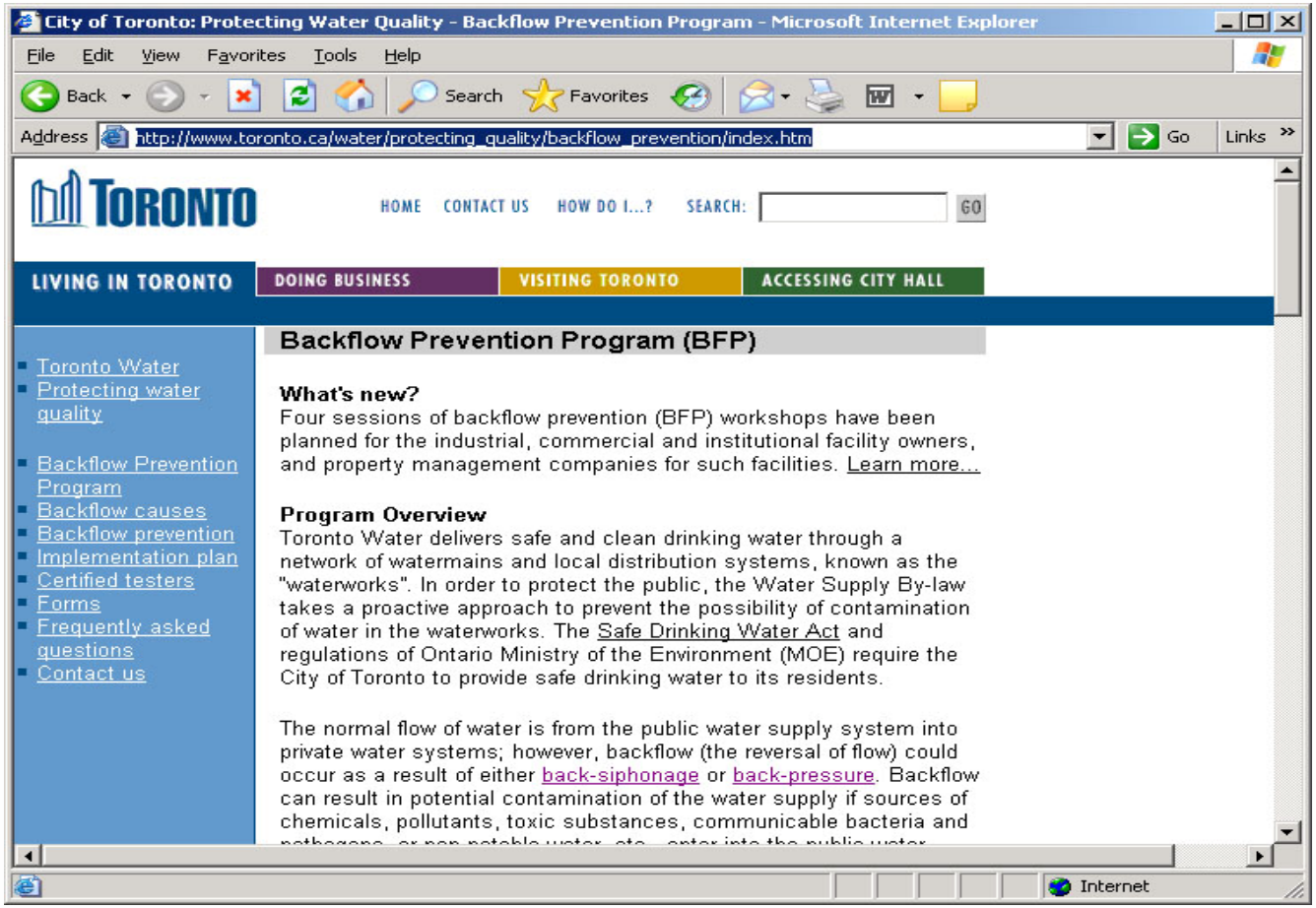
  - Go to … http://www.toronto.ca/water/protecting_quality/backflow_prevention/pdf/bfp_brochure.pdf

  – Send a request to backflow@toronto.ca
  – Call 416-394-8888
  – Drop by a civic centre for pick-up



The City's BFP Website

The City's BFP website can be accessed at:
www.toronto.ca/water/backflow



Frequently Asked Questions

Here are a few common FAQs…

1. **When did the Backflow Prevention Program begin?**
   The City of Toronto's Water Supply Bylaw (Municipal Code, Chapter 851) was enacted on October 22, 2007 and came into effect on January 1, 2008.
2. ***Why are there various compliance dates?***
   The city would like to protect the water supply from the most severe hazard first, followed closely by those sites that pose a lower hazard.
3. ***Why are homes not covered by this bylaw?***
   Single family homes are considered a low hazard and no protection is required in the bylaw. However, homeowners can help to protect our water supply and the water within their own homes by installing backflow prevention devices on their garden hoses.

FAQ (Cont…)

4. Is a building permit required to install a backflow prevention device?

Yes, the Water Supply Bylaw Chapter 851 requires a building permit for projects involving new or altered plumbing, including backflow prevention devices.

- **For more FAQs, please visit…**
  http://www.toronto.ca/water/protecting_quality/backflow_prevention/faqs.htm
- **For all other inquiry's, the City's contact info is on the next slide…**

How to Contact the City

- **Call 311 to report an emergency incident such as a spill or backflow event.**
- **For a general inquiry, concern, issue, or failure /non-compliance of backflow protection, contact:**
  - Backflow Prevention Program

    Environmental Monitoring & Protection
    Toronto Water
    30 Dee Avenue, Toronto, Ontario

    M9N 1S9
    Tel: 416-394-8888

Or, you can send your email inquiry to:

- backflow@toronto.ca