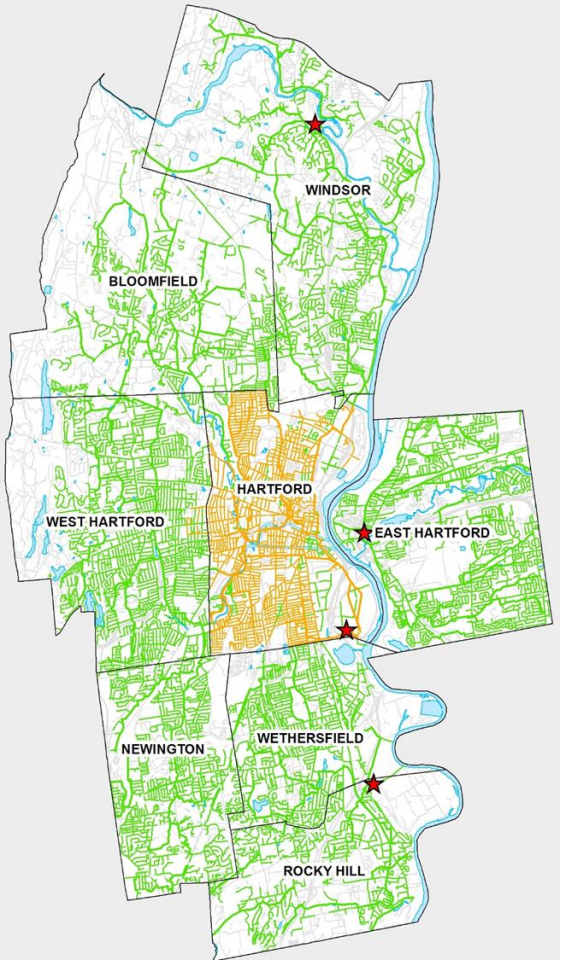
Sewer Backup Prevention and Reporting Program

MDC's assistance program to help customers avoid sewer backups in their homes and properties.

MDC's Sewer System

- 4 Water Pollution Control Facilities
- ~1,200 total miles of sewer
  - 187 miles are combined
  - Combined sewers located in Hartford and small portion of West Hartford
  - Remaining sewers are separated sewers

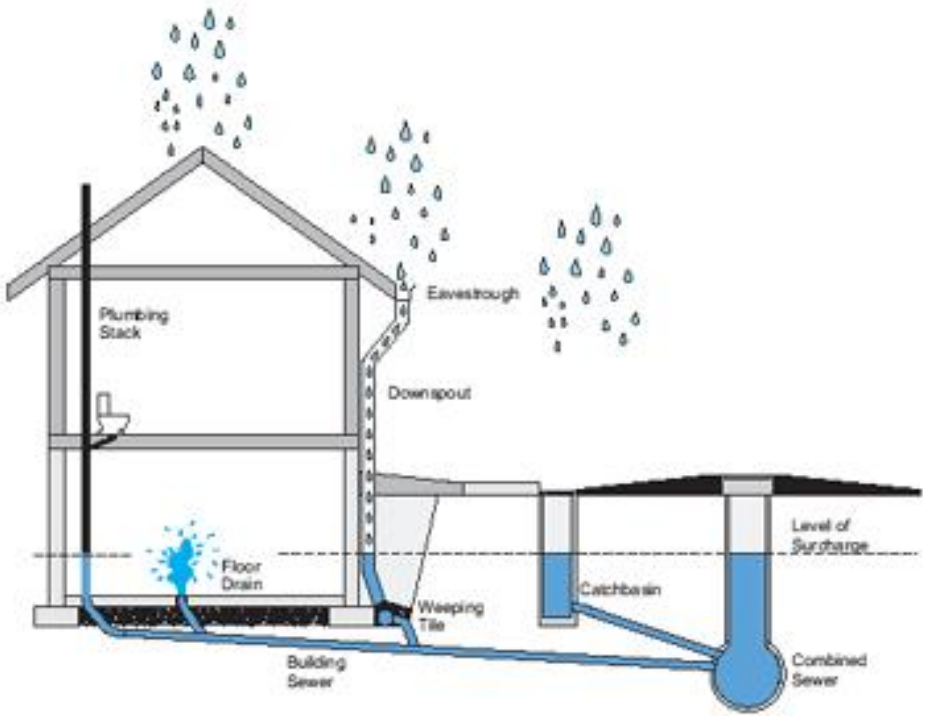


MDC Sewer Ordinance (S21)

- Except as specifically provided with reference to some particular sewer, sanitary sewers shall be used only for the conveyance and disposal of sanitary sewage as defined in Section S1b(2) of this ordinance and for diluted, water-carried industrial wastes which are not objectionable as provided hereinafter. Except as specifically provided for some particular sewer or location, no sanitary sewer shall be used to receive and convey or dispose of any storm or surface water, subsoil drainage, any large continuous flow of water seeping into buildings or excavations from soils or other underground sources, flows of natural springs, or ground waters, surplus from flowing wells, the discharge from roofs, roof conductors, yard drains, street or highway drains.

Combined Sewer Systems

(Hartford)



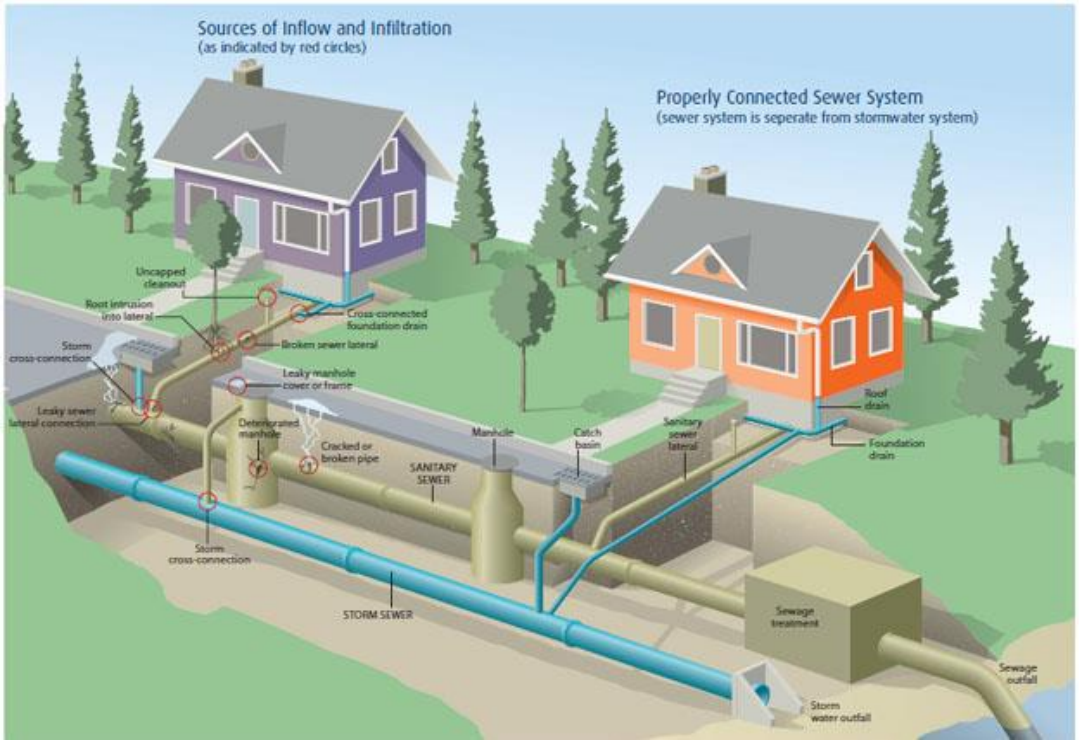
Combined Sewer Systems are piping systems that share one pipe for both storm and sanitary sewer flows. Combined sewer systems are common in older cities constructed prior to the Clean Water Act of 1972. Combined systems are typically supplemented with regulated overflows to relieve the sewer during heavy rain events. MDC has been actively working over the past two decades to reduce the occurrences and volume of overflows through its Clean Water Project.

Why don't Sewer Backups occur during every storm?

Combined systems are typically designed to handle small to moderate storm events and are also supplemented by the regulated overflows to prevent the sewers from exceeding their capacity. In areas of combined system community that do have separate storm and sewer pipes, backups can still occur as flow from other non-separated areas flow through the separated area causing the capacity of the pipe to be exceeded.

Separated Sewer Systems

(Bloomfield, East Hartford, Newington, Rocky Hill, Wethersfield, West Hartford, Windsor)



Separated Sewer Systems are piping systems with separate storm and sanitary sewer pipes. The purpose of having separate pipes is to convey only sanitary or storm water in the respective pipes. By accomplishing this level of separation, capacity issues in the sanitary sewer during storm events are eliminated and will perform similarly as during dry days.

Then why do Sewer Backups occur in Separated Systems?

Backups are due to many sources connected to the Sanitary Sewer, but can be summarized by either **Infiltration** or **Inflow**. **Infiltration** is groundwater that enters sanitary sewer pipes through holes, breaks, joint failures, connection failures, footing drains and other openings. **Inflow** is surface water that enters the sanitary system from yard and roof drains, sump pumps, storm cross-connections to the sanitary sewer (catch basins) and through holes in manhole covers.

What Causes Basements to Flood during Storm Events

- MDC's separated sanitary sewer piping network is designed to handle sanitary wastewater flow, not storm water or groundwater. During very heavy rainfalls, due to the number of private connections of sump pumps, foundation drains, roof leaders, the separated sanitary sewer system can become overwhelmed by the additional storm water and groundwater introduced into the system. When that happens, stormwater and sewage in the sewer system can be forced back up and into basements as the sewer pipes in the street become overwhelmed.
- In most cases, the MDC sewer system can handle the increases in volume due to the excess storm water and groundwater without flooding. However, flooding will occur when the volume exceeds the capacity of the sewer system.

What Causes Sewer Blockages

- **Failure of Main Sewer** - **Blockage** within the pipe due to soil settlement, tree roots, grease buildup and other debris or **Pipe Collapse**.
- **Failure of Service Lateral** – Blockage or Pipe Collapse

Note: Customer's are responsible for maintenance of their service laterals, which includes removal of blockages for the entire length of the lateral and repair of a material defect in the pipe within the limits of the customer's property. If the material defect is located within the public right-of-way and requires excavation to repair, MDC will make the repair on behalf of the customer.

What Should Customers Do If the Sewer Backs Up?

If you are experiencing a sewer backup, have limited or no sewer service within your home or notice water bubbling out of a sewer manhole in the street, you may be experiencing a sewer back up or some other internal plumbing issue. Please call the MDC Command Center at (860)278-7850 and press 1 immediately.

While every effort will be made to respond to your backup problem as quickly as possible, you should be aware of what to do while help is on the way:

- Avoid using toilets, sinks, showers, washing machines, dishwashers, etc. Since wastewater from these appliances has nowhere to go, your backup will only get worse.
- Minimize contact with the wastewater backing up in your home. After the problem has been resolved, wash basement walls and floors with a disinfectant.
- Never operate or disconnect an electrical appliance or main fuse box while standing in water. Play it safe! Call your local electric utility if you need your power shut off.
- If possible, move your valuables to the upper floors of your home, and notify your insurance company if damage occurs.

MDC's Response to Sewer Backups

- After receiving your call, the MDC will dispatch emergency responders to investigate the sewer issue. For your guidance please read the 37A form to assist you until our first responders arrive at your location.
- If it is determined that the backup is due to a **blockage** in the MDC's main sewer, MDC will immediately dispatch the sewer department crew to restore service, by cleaning and/or repairing the main sewer.
- If, however, MDC determines the blockage is not in the main sewer, we will inform you that the **blockage** is in the sewer lateral (the sewer pipe that runs from your house to the main sewer) and the 37A form will be given to you and clearly explained. Since ownership and maintenance of the sewer lateral is the homeowner's responsibility, MDC staff will discuss your options as outlined in the 37A form.

Why are Basements Effected?

- During rain events and snow melts, the volume of water may go beyond the capacity sanitary sewer pipe. In this event the excess volume will relieve itself at lowest relief point nearest the capacity exceedance.
- Most common relief points are unprotected plumbing fixtures in basements which include:
  - Foundation Drains
  - Basement Bathrooms (Toilet, Sink, Shower, Bathtub)
  - Slop Sink/Washing Machine Drains
  - Floor Drains
  - Open Cleanout Caps
  - Sump Pumps connected to sanitary sewer

MDC's Ongoing Work to Resolve System Backups

- For the past 15 years, MDC has ramped up its maintenance activities as part of our Capacity, Management, Operations and Maintenance (CMOM) program to improve the system's overall capacity through cleaning, inspection, repairs and lining of sewers as part of the current US EPA Consent Decree to eliminate Sanitary Sewer Overflows.
  - Cleaning activities have addressed portions of the system that have accumulated sediment;
  - Inspection activities have identified pipes with defects such blockages due to roots and pipe collapses;
  - Repair activities have included replacement of sections of pipe to eliminate blockages;
  - Lining of pipes have addressed pipe segments that are near failure and/or have significant infiltration due to open joints or cracks. Lining of pipes also reduces sediment and grease buildup in sanitary sewers.
  - These are ongoing activities and will continue as MDC has adopted them into our normal operations.
  - Improving maintenance access to entire sanitary sewer collection system via Vegetation Management Program (VMP) across all existing sanitary sewer easements. Approximately 100 miles of sanitary sewers are being addressed by this program.

MDC Consent Decree Summary

- Consent Decree Field Investigations
  - SSES Investigations
  - SSO Pilot Study
  - CMOM Program
    - Routine Pipe Inspections & Cleaning
    - Sanitary Sewer Easement Maintenance
- Sewer Capacity Analysis
  - USEPA Based SWMM Model Utilized per Consent Decree
    - Updated/calibrated from 2007-2014
    - Maintained by MDC's CWP Program Management Consultant
    - Utilized for evaluation of Consent Decree Solution Alternatives
- Recommendations
  - Mainline (aka sanitary sewer) Rehabilitation
  - Additional Inflow and Infiltration (I/I) Removal (private property)
  - Capacity Improvement Projects
- Incorporated into Integrated Plan (December 2018)

What Programs are Available to Assist Customers?

Sewer Backup Prevention & Reporting Program

- Primary goal is to educate customers on sewer back-up prevention, provide backwater valve devices to protect plumbing fixtures, remove inflow and infiltration sources from the sewer system through sump pump disconnections and to identify areas of the system that require further investigation or maintenance.
- Program Details:
  - Install backwater valve devices on sinks and washing machine drains and other above floor fixtures to building code standards. (All Towns)
  - Replace Footing Drain Back Water Valves (Hartford Only)
  - Remove and cap old footing drain and backwater valves and install a sump pump to redirect groundwater infiltration out of the sanitary sewer system (Separated System Member Towns Only)
  - All work is performed by licensed contractors, permitted through the local building department and free for customers.
- MDC will also provide input on how to address unprotected fixtures with drains below the floor which include showers, bathtubs and toilets. It's the customer's responsibility to bring these fixtures into compliance with local plumbing code to provide full protection for the basement.

Other Programs Available to Assist Customers

Service Lateral Replacement Program

- Primary goals are to provide affordable financial assistance to customers to replace existing sewer service connections prior to them failing and resulting in a backup and to replace services that contribute groundwater infiltration to the sewer system.
- Program Details (All Member Towns):
  - Each customer is allotted $10,000 for the replacement/rehabilitation costs
  - The full length of the sewer lateral must be replaced or rehabilitated
  - Must be built/rehabilitated to MDC standards
  - Homeowners will repay the MDC over a 15 or 20 year period with a 6% interest rate, with no prepayment penalties.

Responsibilities of the MDC and the Towns to ensure Building Code Compliance and Protection against Backups

- Intention of Universal Conformance to the 2015 International Building Code
  - Protect individual fixtures and branch lines with backwater devices while leaving the main sewer drain/stack unobstructed
  - Allow devices above manhole frame level to drain freely during a backup event
  - Limits flows through the back water valve to reduce wear and tear/maintenance and risk of failure
- For plumbing, standard is 2015 International Plumbing Code
- Applicable sections for backwater valves include:
  - Section 715 – Sanitary Sewer Backwater Valves
  - Section 1101.9 – Storm Drain Backwater Valves (References Section 715)

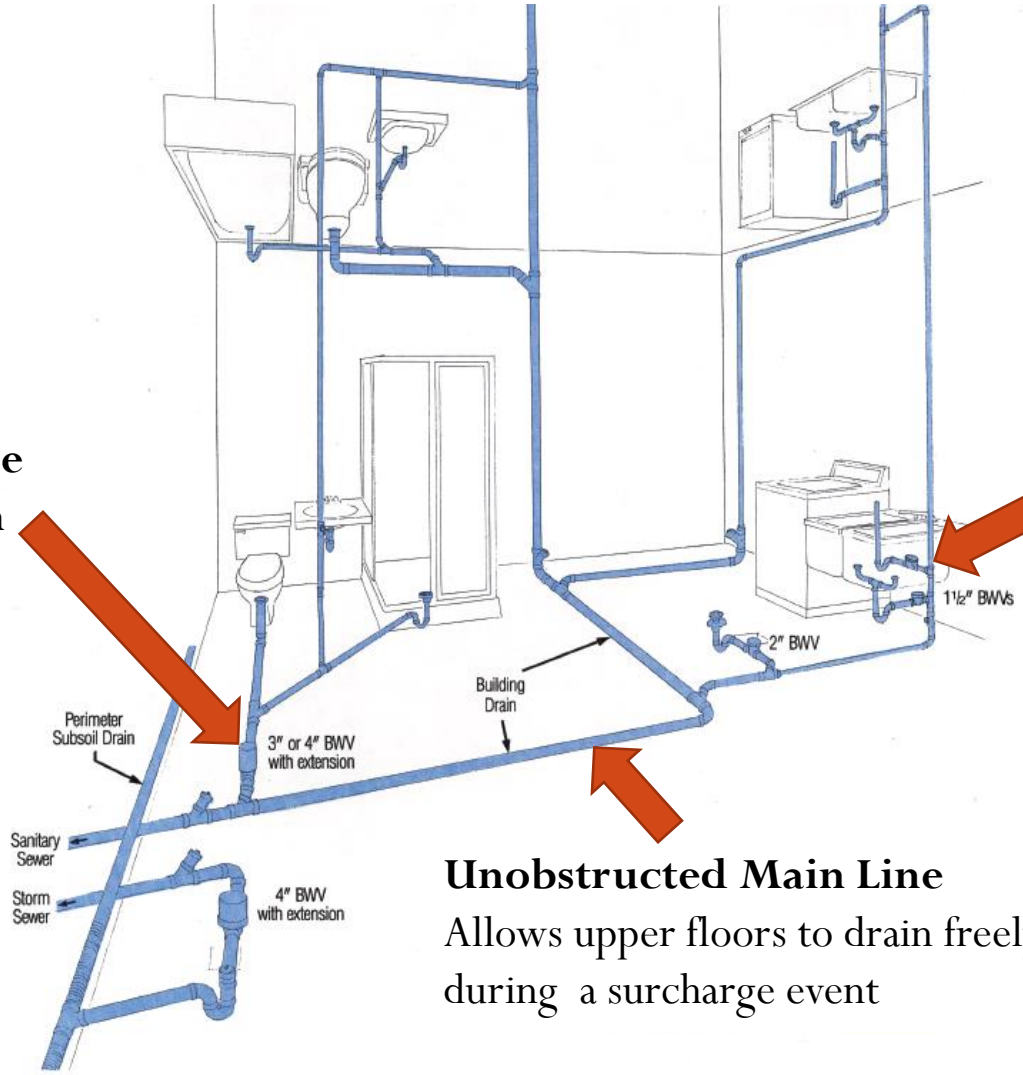
Section 715 – 2015 Plumbing Code

- **715.1 Sewage Backflow.** Where plumbing fixtures are installed on a floor with a finished floor elevation below the elevation of the manhole cover of the next upstream manhole in the public sewer, such fixtures shall be protected by a backwater valve installed in the building drain, or horizontal branch serving such fixtures. Plumbing fixtures installed on a floor with a finished floor elevation above the elevation of the manhole cover of the next upstream manhole in the public sewer shall not discharge through a backwater valve.
- Exception: In existing buildings, fixtures above the elevation of the manhole cover of the next upstream manhole in the public sewer shall not be prohibited from discharging through a backwater valve.

Section 715 – 2015 Plumbing Code

- **715.2 Material.** Bearing parts of backwater valves shall be of corrosion-resistant material. Backwater valves shall comply with ASME A112.14.1, CSA B181.1 or CSA B181.2.
- **7.15.3 Seal.** Backwater valves shall be so constructed as to provide a mechanical seal against backflow.
- **7.15.4 Diameter.** Backwater valves, when fully opened, shall have a capacity not less than that of the pipes in which they are installed.
- **7.15.5 Location.** Backwater valves shall be installed so that access is provided to the working parts for service and repair.

Code Compliant Plumbing



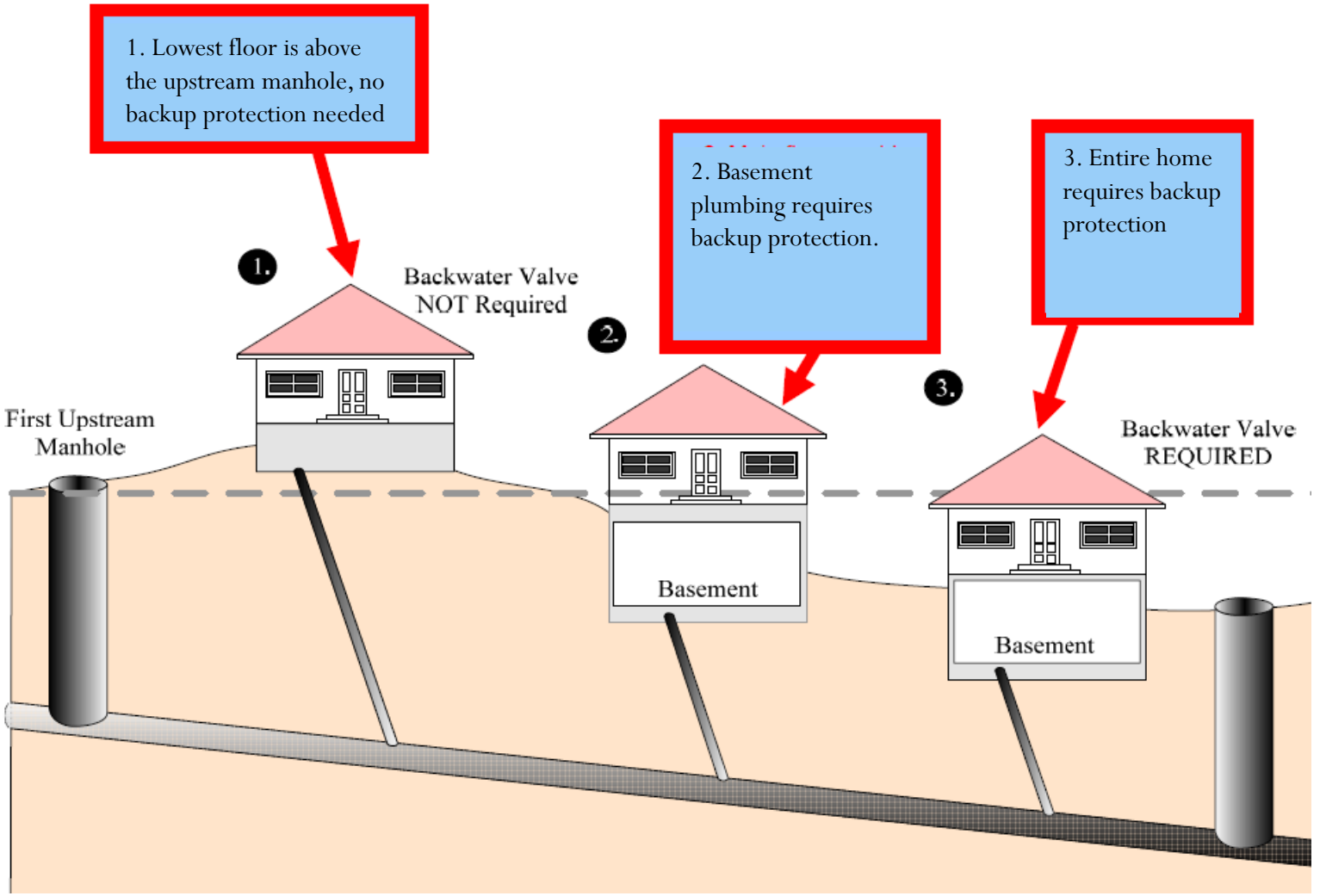
Branch line protection

Individual fixture protection

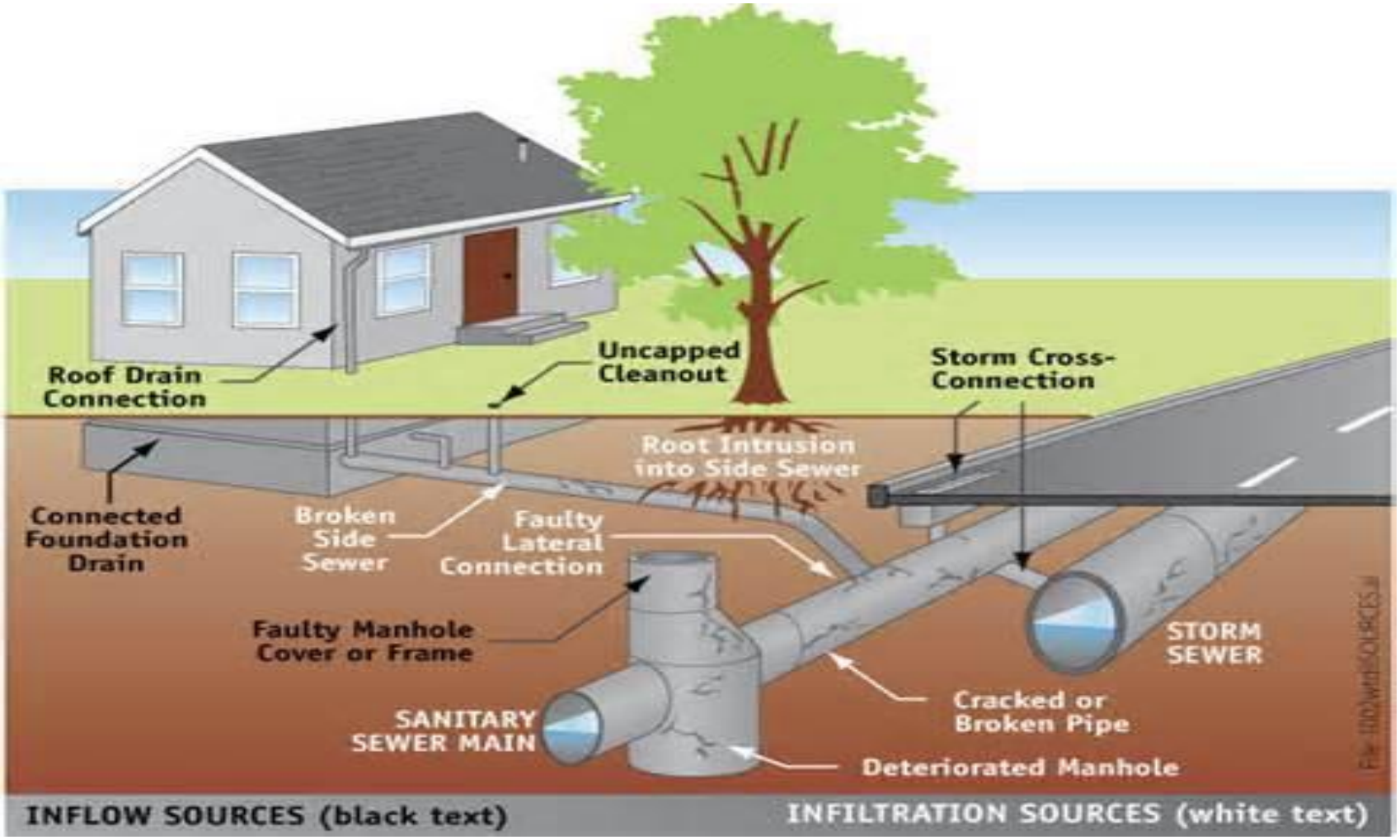
Unobstructed Main Line

Allows upper floors to drain freely during a surcharge event

When Backup Protection is Needed



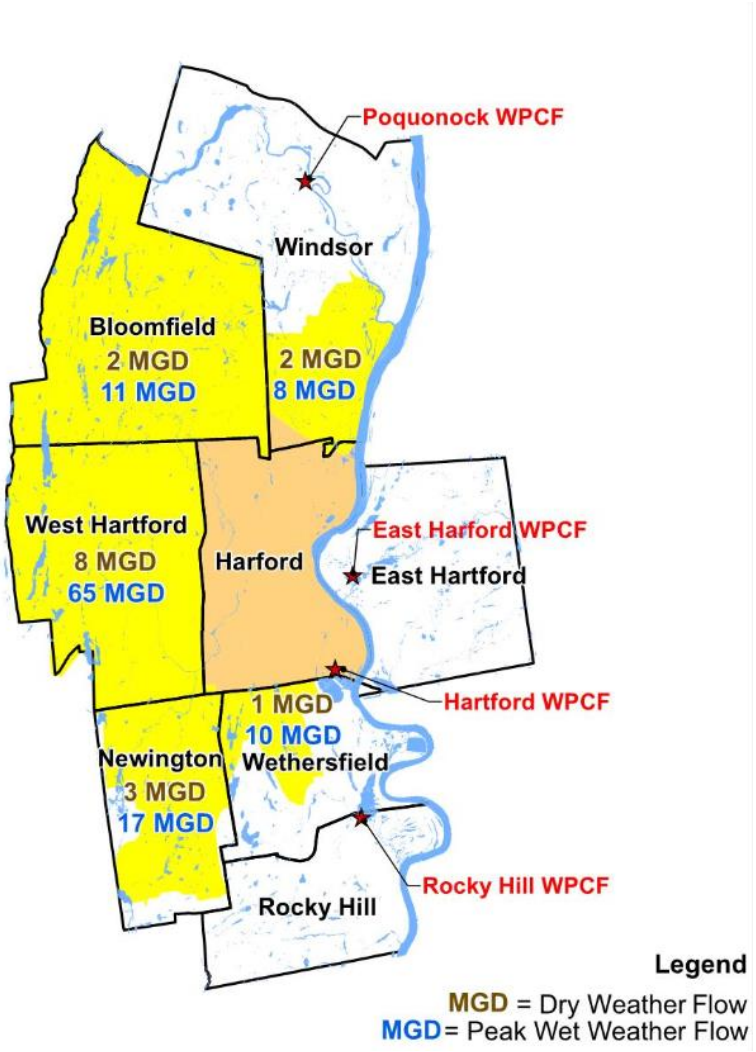
Inflow and Infiltration Sources



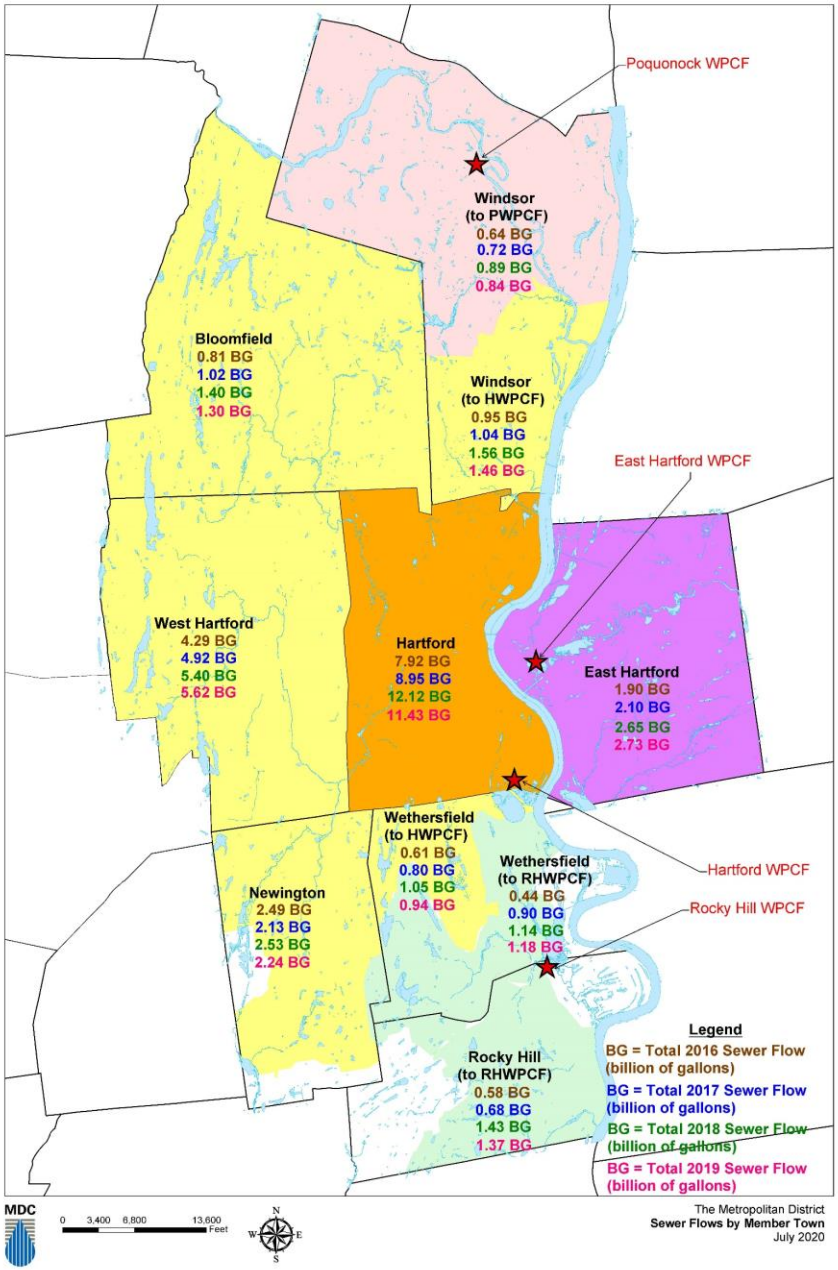
Typical Dry and Wet Weather Flows by Town

(Inflow and Infiltration are sources of Wet Weather Increases)

- **Dry day** – no difference (household sewage plus some I/I)
- **Wet day** – no flow from catch basins/brooks, BUT still additional flow from I/I sources



HWPCF Sewershed Comparison



- Total HWPCF Separated Sewer Flows 2016-2019
  - West Hartford = 20.23BG
    - 47% Separated
    - 24% Total
  - Bloomfield = 4.53BG
    - 11% Separated
    - 6% Total
  - Newington = 9.39BG
    - 22% Separated
    - 11% Total
  - Wethersfield = 3.40BG
    - 8% Separated
    - 4% Total
  - Windsor = 5.01BG
    - 12% Separated
    - 6% Total
  - Hartford = 40.42BG
    - 49% Total