



UNDERSTANDING YOUR SEWER

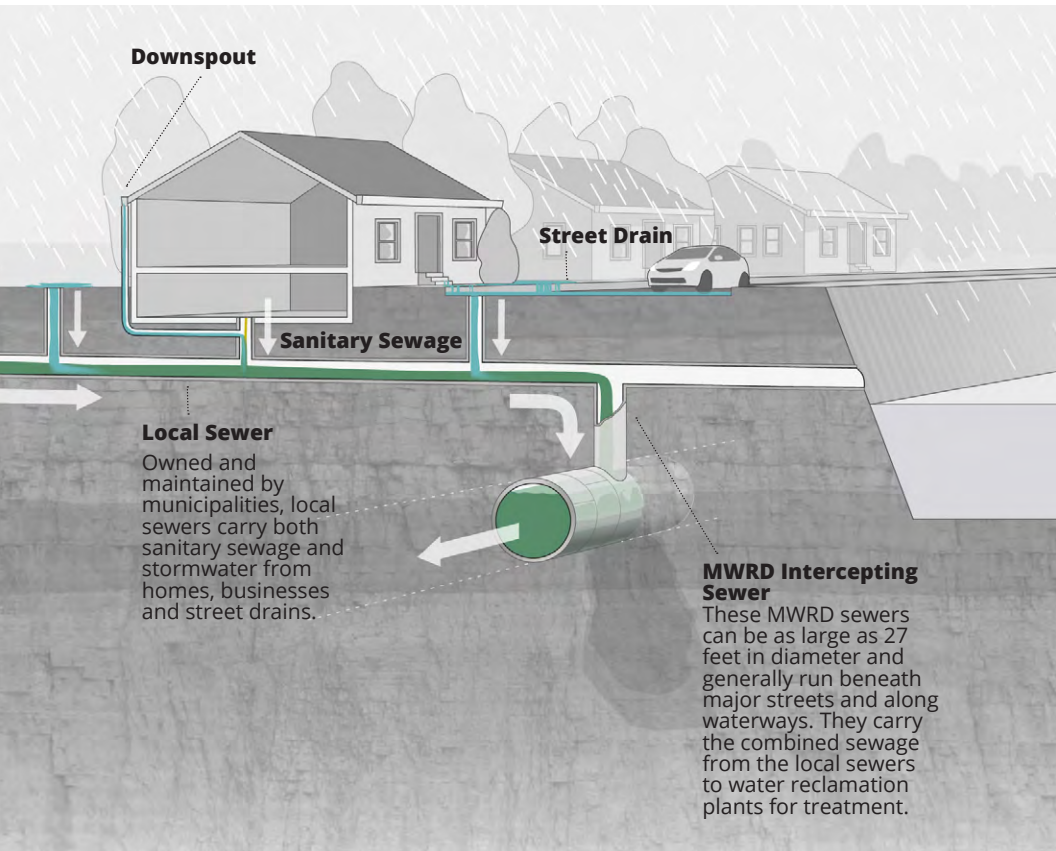
**An Introduction to the Chicago
Area's Combined Sewer Systems**



**Metropolitan Water
Reclamation District
of Greater Chicago**

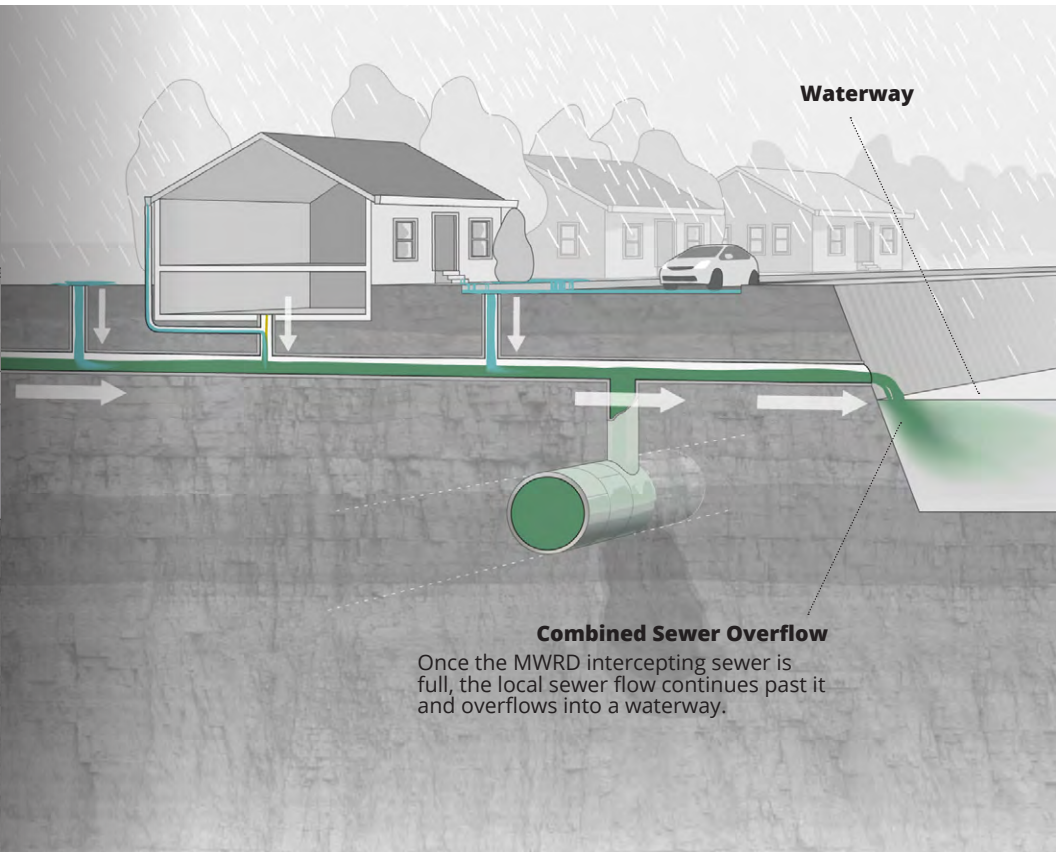
What is a combined sewer?

In a combined sewer system, sanitary sewage and stormwater drain into the same pipes. Homes, businesses and street drains are connected to the local sewers, which are owned and maintained by municipalities. Local sewers flow by gravity into the Metropolitan Water Reclamation District of Greater Chicago (MWRD) intercepting sewers, which then convey the flow to MWRD water reclamation plants for treatment.



What is a combined sewer overflow?

If the intercepting sewers and water reclamation plants reach capacity during heavy rain, the local sewer continues to drain, or "overflow," to a waterway.



Illustrations not to scale.

Why do our sewers overflow into waterways?

They were designed that way. Most local sewers in the Chicago area (and in other older cities around the world) were built over 100 years ago, before wastewater treatment existed. They were designed to drain sanitary flow and a limited amount of stormwater directly to the river.

Most of these local sewers are required to carry much more water today than they did when they were first put into service, and as a consequence, they can exceed their flow capacity, causing backups.

Early Chicago Area Sewers

Less Rainfall

Rainstorms were generally less intense than the record-breaking storms the Chicago area has seen in recent years.

More Open Space

Water was allowed to pool and gradually soak into the ground in open areas that are now developed.

Less Wastewater

Without dishwashers, washing machines, garbage disposals, and other appliances, each home produced less wastewater than today.

More Absorbent Ground

More unpaved land allowed water to soak into the ground, rather than being directed into the sewers.

No Intercepting Sewers

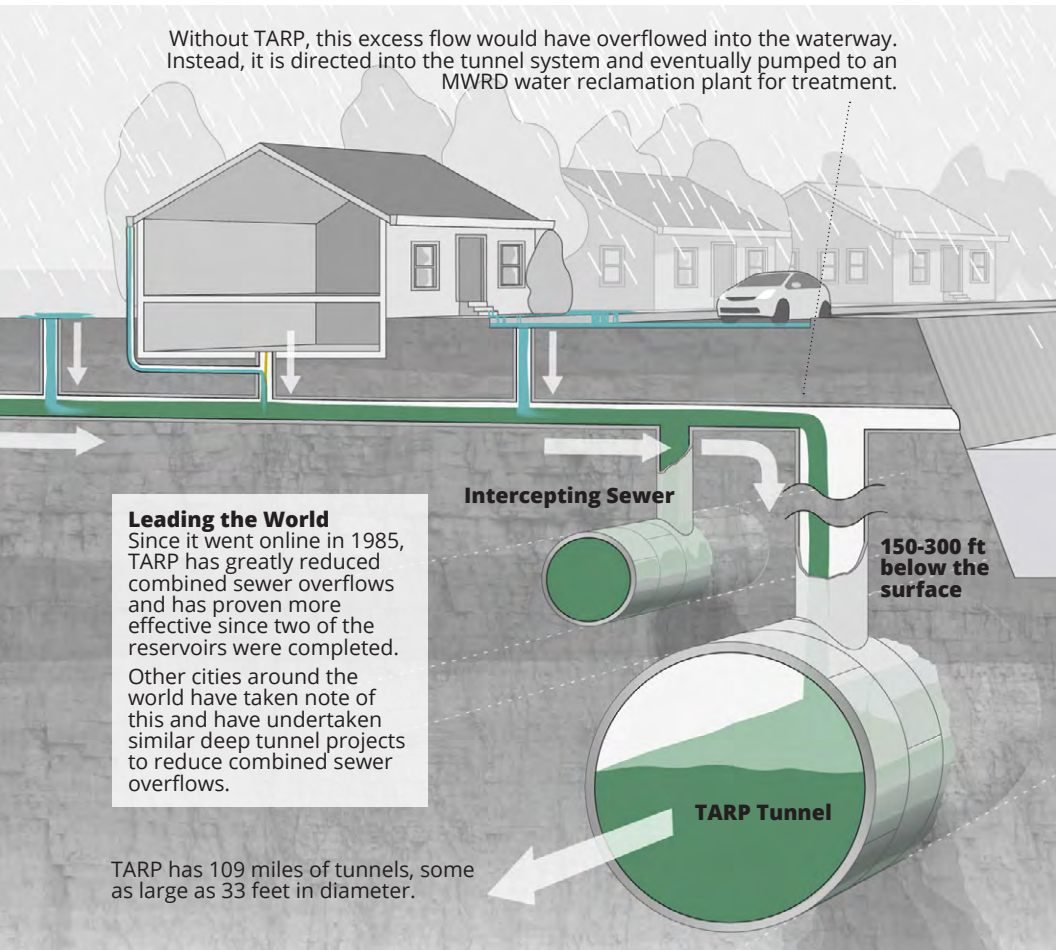
Until the MWRD built intercepting sewers and treatment plants in the early part of the 20th century, local sewers flowed directly into waterways.

What is the purpose of the “Deep Tunnel,” or TARP (Tunnel and Reservoir Plan)?

The MWRD’s Tunnel and Reservoir Plan (TARP) or “Deep Tunnel” system is designed to reduce flooding and pollution caused by combined sewer overflows.

TARP tunnels act like very large intercepting sewers, capturing the excess flow from the combined sewers before it can reach the waterway. Excess flow is stored in the tunnels but will also be sent to the large storage reservoirs. The “tunnels” portion of TARP was completed in 2006 and is fully operational. The “reservoir” portion of TARP is currently under construction. The stormwater captured by TARP is eventually pumped to the MWRD water reclamation plants for treatment.

Without TARP, this excess flow would have overflowed into the waterway. Instead, it is directed into the tunnel system and eventually pumped to an MWRD water reclamation plant for treatment.

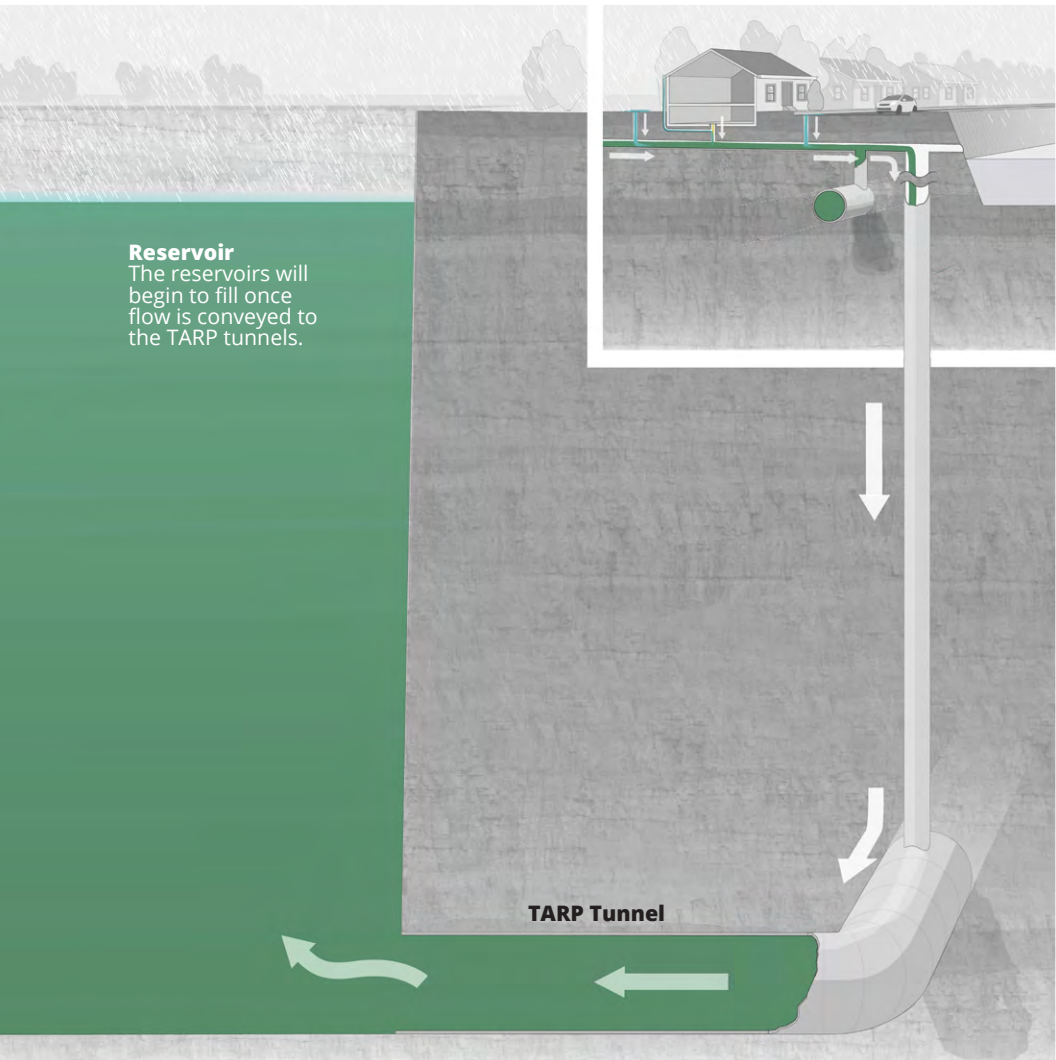


Leading the World
Since it went online in 1985, TARP has greatly reduced combined sewer overflows and has proven more effective since two of the reservoirs were completed. Other cities around the world have taken note of this and have undertaken similar deep tunnel projects to reduce combined sewer overflows.

TARP has 109 miles of tunnels, some as large as 33 feet in diameter.

How will the reservoirs help?

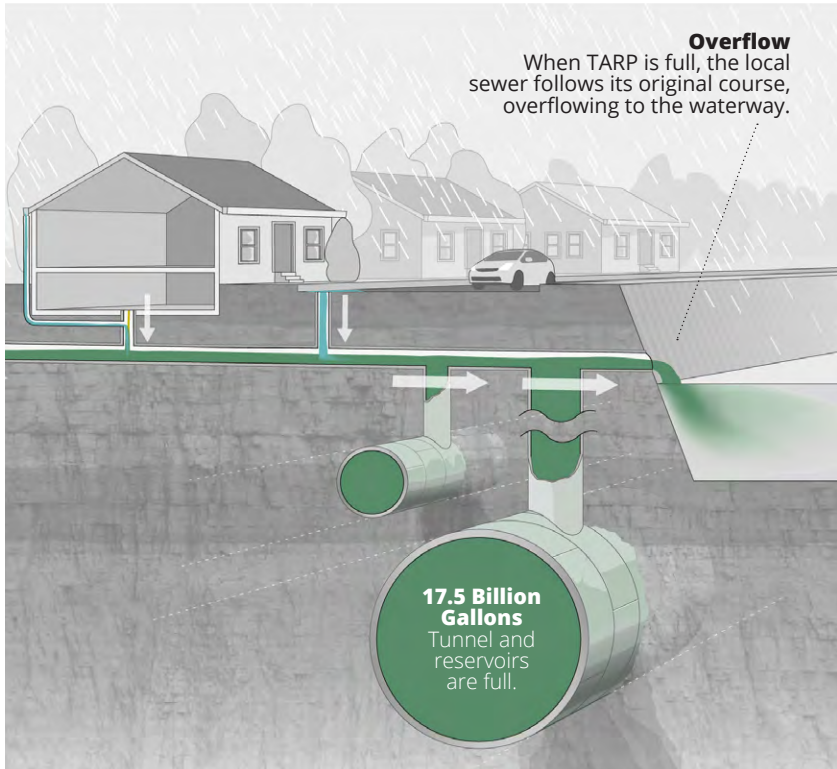
The reservoirs will increase the storage capacity of TARP and will capture and store combined sewage that would otherwise overflow into the waterways. The TARP system includes three reservoirs to receive and store the flow from the tunnels during heavy storms. Two of the three reservoirs are complete and the first stage of McCook Reservoir is in service, with a second stage still under construction. When the reservoirs are complete, the system will have a total capacity of 17.5 billion gallons.



What if TARP is full?

Although it is one of the largest civil engineering projects ever undertaken, TARP capacity is not unlimited and can fill during intense storms. When TARP is full, the local sewers overflow by gravity into the waterways, as they did before TARP was built.

The tunnels currently are used for storage and can hold 2.3 billion gallons. When totally complete, the reservoirs will add 15.15 billion gallons of capacity, but it will still be possible for the system to fill during extreme storms.



What causes sewer backups?

Backups are usually caused by insufficient flow capacity at some point in a sewer system. The system cannot drain as quickly as it is being filled.

One way to understand the concept of flow capacity and the difference between normal sewer flow and a sewer backup is to imagine a kitchen sink being filled with water.

Normal Flow

If the faucet is turned on and there are no obstructions in the sink, the water flows into the sink and exits through the drain. The flow from the faucet is slow enough for the drain to keep up, and as a result the water never spills over the edge of the sink.



Backup

If the faucet is still turned on and you quickly pour a large pan of water into the sink, the drain can not empty the sink as quickly as it is being filled and the water level rises until it overflows. This does not mean the sink or drain is somehow defective; it only means its flow capacity has been exceeded.

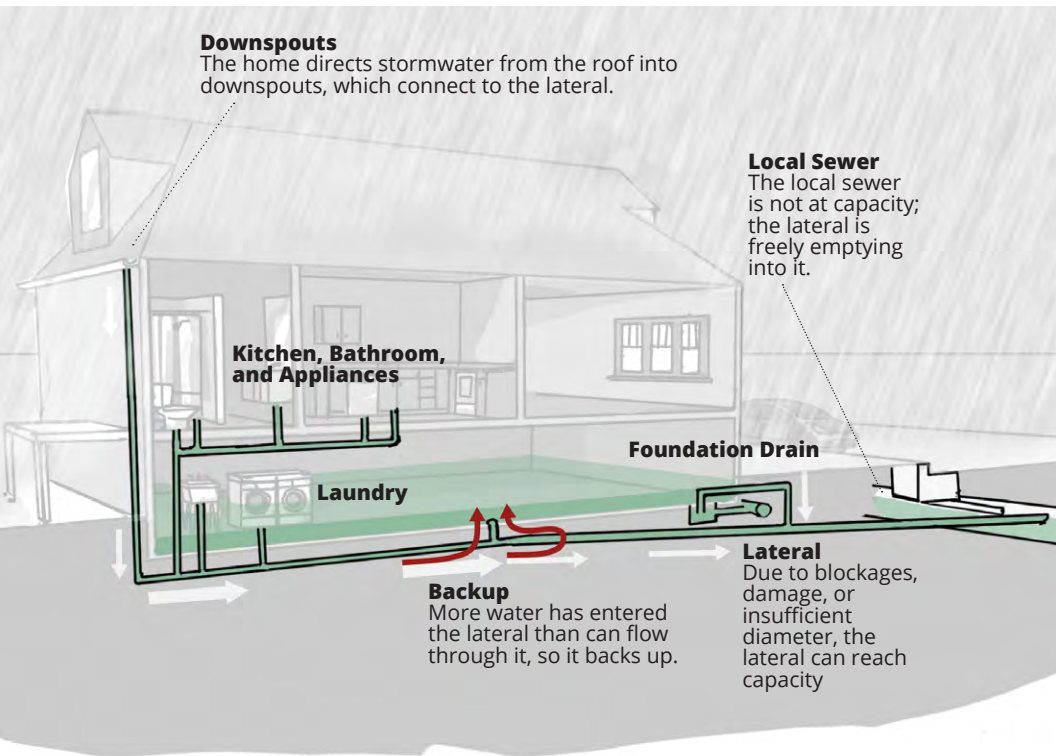


What is a lateral connection?

A lateral connection is the pipe that connects your home to the local sewer system. Your lateral connection—which is usually 6 inches in diameter and runs from your house to the local sewer under your street—is your property and it is your responsibility to maintain it.

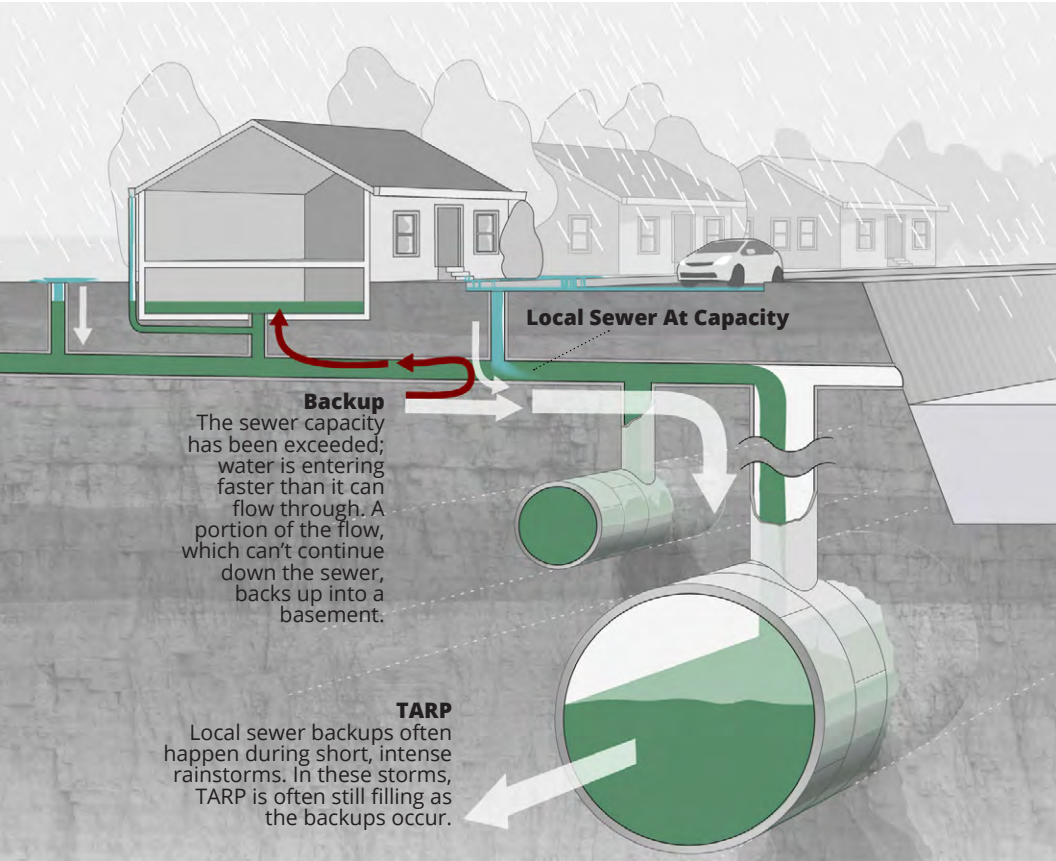
If your lateral connection is clogged with debris, damaged, or flowing at capacity, a storm can cause a backup on your property even if the local sewer is not at capacity. Regular cleaning and maintenance by a qualified, experienced plumber are required to keep the system operating efficiently.

A house with a roof that is 800 square feet can send about 500 gallons of water to its lateral connection during a one inch storm. During storms, water enters the sewer system from a home's roof via downspouts. Appliances, kitchen and bathroom drains also add to the flow volume.



Sewer Backups

Sewer backups may not be limited to an individual property. When a lot of rain falls in a concentrated area over a short period of time, stormwater may enter sewers faster than it can flow through them, exceeding their flow capacity. When this happens, some of the combined sewage cannot reach TARP or the waterway quickly enough and it can back up into streets and unprotected basements.



What you can do to prevent sewer backups

- Have a qualified, experienced plumber who guarantees their work inspect your basement. To protect your home from sewer backups, have a check valve or overhead sewer installed. These are valuable home improvements that will prevent sewer backups if properly installed.
- Disconnect your home's downspouts so they drain onto pervious (absorbent) surfaces instead of into the sewer system. It is important to make sure the disconnected downspout does not direct water toward your foundation or a neighbor's foundation. Consider directing flow to a rain barrel or rain garden area. Your neighbors are likely served by the same local sewer, so encourage them to do the same.
- You can connect downspouts to rain barrels (available at cost from the MWRD) to save the rainwater for reuse.
- Consider replacing your driveway and other paved areas on your property with pervious surfaces that can absorb stormwater.
- Don't flood yourself. Have your lateral connection inspected for blockages or damage that could cause basement backups.

For more information about preventing backups, search for "sewer backup prevention" at cityofchicago.org and fema.gov.

What your municipality and the MWRD are doing to prevent sewer backups

- The MWRD and your municipality are committed to working together to prevent problems with the sewer systems.
- The MWRD and your municipality regularly inspect, maintain, and clean sewers to ensure they are operating properly.
- The MWRD is completing the last remaining TARP reservoir. The McCook Reservoir Stage II will provide an additional 6.5 billion gallons of storage, in addition to 3.5 billion gallons of capacity already made available through Stage I.
- The MWRD is working with municipalities and non-governmental organizations to adopt green infrastructure. Technologies such as porous pavement, rain gardens, native plant landscaping, bio-swales, green roofs, and greenways allow stormwater to be absorbed into the ground instead of flowing into the sewer system. Reducing the burden on the sewer system will help reduce sewer overflows and the likelihood of backups.



The Metropolitan Water Reclamation District of Greater Chicago (MWRD) produced *Understanding Your Sewer* to provide an overview of the combined sewer systems in the Chicago area and explain how they operate during rainstorms.

The MWRD welcomes public understanding of this vital infrastructure and encourages our residents to become informed participants in the discussion about sewers, stormwater and flooding.

For additional information about the MWRD's operations, intercepting sewers, treatment facilities, TARP, and more, contact MWRD Public Affairs at 312.751.6633, go to mwrdd.org, or write to public.affairs@mwrdd.org.



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