# Thornton Reservoir

*Thornton Reservoir has a capacity of 7.9 billion gallons.*

Referred to as the "Grand Canyon of Chicago's South Suburbs," the Thornton Reservoir is the largest combined sewer reservoir in the world, designed to provide up to 7.9 billion gallons of storage to protect the quality of the Calumet River area waterways and mitigate flooding by reducing basement backups and addressing overbank flooding from nearby Thorn Creek. The Metropolitan Water Reclamation District of Greater Chicago (MWRD) completed the reservoir in 2015 as part of the Tunnel and Reservoir Plan (TARP), also known as the "Deep Tunnel." Its sheer size has helped nearly eliminate combined sewer overflows (CSOs) by collecting this stormwater and sewage before it can be conveyed to the Calumet Water Reclamation Plant five miles north to be transformed into clean water and released into the Little Calumet River. Thornton Reservoir is so large that it could fit six Soldier Field stadiums inside it, or fill 144 million rain barrels, enough to circle Earth 3.64 times when laid end to end.

The vast reservoir is fed by a 36.7-mile Calumet Tunnel System that holds up to 630 million gallons of water and serves a 91-square-mile area of combined sewers that were constructed to collect both stormwater and sewage. Following the adoption of TARP in 1972, the first section of the Calumet Tunnel, the Cal-Sag Channel Leg (186 million gallons), was completed in 1986. From there, the MWRD completed the 140th Street and Indiana Leg of the tunnel (236 million gallons) in 1996, and the Torrence Avenue Leg (141 million gallons) and Little Calumet Leg (59 million gallons) in 2002 and 2006 respectively. The Thorn Creek Overflow Tunnel was connected to the Thornton Reservoir in September 2022, directing storm flows from Thorn Creek and completing the system.

## An instant impact

The Thornton Reservoir benefits 556,000 people living on the Far South Side of Chicago and 13 surrounding suburbs. Located in South Holland, Ill., the reservoir is in the northern lobe of the Thornton Quarry, which is divided from the southern half of the quarry by the Tri-State Tollway (I-294/I-80). Since becoming operational in 2015, the reservoir in its first decade captured approximately 62 billion gallons of combined sewage and prevented it from entering local waterways. The reservoir has captured over 99 percent of the volume of water that enters the system since the reservoir was placed into service, and there has not been a CSO since 2020.

## History

The Thornton Reservoir is part of the Thornton Quarry which dates to the 1860s. The reservoir was chosen for the location because the bedrock comes nearly all the way to the surface. Hanson Material Service, now known as Heidelberg Materials, excavated the bedrock and this aggregate was sold and used for road and building construction. The MWRD constructed the Thornton Reservoir in two stages. The first stage, a temporary flood control reservoir called the Thornton Transitional Reservoir (TTR), was completed in March 2003 in the west lobe of Thornton Quarry. The TTR provided overbank flood relief for nine communities and captured more than 58 billion gallons of floodwater during 83 fill events before it was decommissioned in 2022.

## Constructing gates, tunnels and the world's largest combined sewer reservoir

Excavation on the Thornton Reservoir was completed in 2013. To seal the reservoir, two mining haul tunnels were plugged with concrete and a dam made of roller compacted concrete was constructed under the tollway. Around the perimeter of the reservoir, holes were drilled up to 500 feet deep as part of a grout curtain that ties into an impermeable natural layer of shale.

About 1,000 feet into the tunnel, two-wheel gates isolate the tunnels from the reservoir when necessary. In total, there are four gates that weigh approximately 100 tons. A concrete apron constructed in front of the tunnel controls erosion by withstanding the force of the water coming out of the tunnel at velocities of up to 30 feet per second. The MWRD has also installed and invested heavily in odor control technology and monitoring systems. Building the world's largest reservoir of its kind is not void of unforeseen challenges when there is

**Thornton Reservoir and Calumet Tunnel System**

- **Service area:** 91 square miles
- **Tunnels:** 0.63 billion gallons (BG) capacity, 36.7 miles
- **Thornton Reservoir:** 7.9 BG capacity

**Benefiting Communities:**

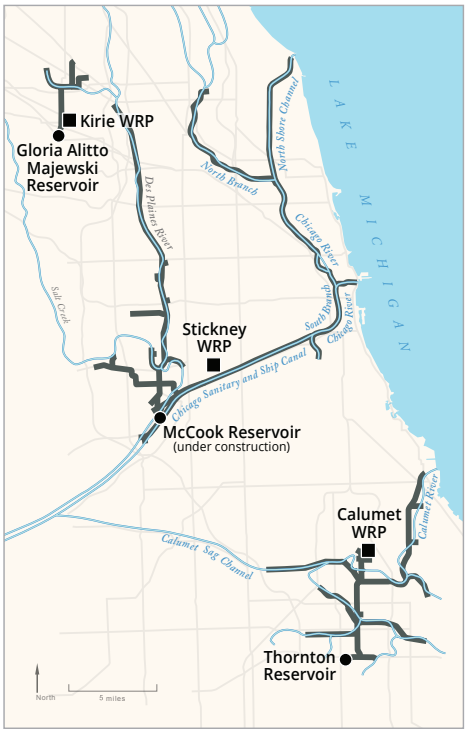
Blue Island, Burnham, Calumet City, Calumet Park, Chicago, Dixmoor, Dolton, Harvey, Lansing, Markham, Phoenix, Posen, Riverdale, South Holland

*The 36.7-mile Calumet TARP tunnel system captures combined sewer overflows and carries water to Thornton Reservoir.*

no blueprint to follow. But because of TARP, water quality in local waterways has improved with increasingly healthy and diverse fish populations and new recreational demand.

Other cities around the world have taken note of TARP's success and are now undertaking similar projects.

## TARP Tunnels and Reservoirs




## How TARP Works