# Metropolitan Water Reclamation District of Greater Chicago

A UTILITY OF THE FUTURE


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**RECOVERING RESOURCES, TRANSFORMING WATER AND PROTECTING THE ENVIRONMENT**



THE METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

# The Utility for the Future You Can Rely On Every Day

As the Metropolitan Water Reclamation District of Greater Chicago (MWRD) celebrates 130 years of dedicated service to the residents of Cook County and the Chicago area, we at the MWRD continue to build on an accomplished record of reliability and ingenuity in protecting the area waterways, public health and the environment.

Throughout its history, the MWRD has made an indelible imprint on the Chicago area and the quality of life for all our residents. The MWRD established this reputation for unfaltering dependability and innovative leadership treating the region's wastewater, managing stormwater and protecting our water resources. While our generations of service are historically significant, there are many more exciting chapters on the horizon.

Since undertaking the extraordinary task of reversing the flow of the Chicago River to protect Lake Michigan, the MWRD engaged in more than a century of progress and continuous innovation to care for our water environment. Those early commitments were aimed at protecting the public's health and water resources, and while the MWRD maintains that same level of excellence at an exceptional value to taxpayers, we also pride ourselves in cleaning water in the face of an evolving system of water treatment. Today, we are met with a changing climate, record rain events and an increased use in impervious pavement across our flat terrain. As a result, we are continuously challenged to find comprehensive solutions to manage stormwater and prevent flooding, all while grasping emerging technologies to improve local water quality and protect a river that is soaring in popularity. To meet this demand, we are developing new systems to reduce nutrients in our water, decreasing greenhouse gas emissions, conserving and reusing water, recovering renewable resources, and maintaining a tradition of reliability and resourcefulness that has become a hallmark for our agency across the region.

As a utility of the future, the MWRD is also educating the communities it serves and working with stakeholders to create awareness for our water environment. By actively forming new partnerships, engaging the public and urging our communities to consider the countless ways we can all contribute to improving our water environment, we are taking a role of leadership, fostering collaboration, broadening our reach and magnifying our impact.

The perseverance of the MWRD is shown in the resiliency of Cook County. The MWRD continues to rise to the challenge to effectively manage stormwater and mitigate flooding, and that commitment is expected to continue for generations to come. This publication will highlight the many ways the MWRD has grown to become the utility of the future you can rely on every day. ✶







*In its daily role of recovering resources and transforming water, the MWRD is protecting the regional water environment and mitigating flooding through its 109 miles of tunnels serving the Tunnel and Reservoir Plan (above), recovering nutrients from water to be reused as fertilizer (above right) and processing biosolids to be reused as compost and other soil amendments to help grow plant life (bottom right).*





*Cleaner waterways spurred by the work of the MWRD has led to healthier aquatic life as well as increasing opportunity for economic development, recreational activity, transportation and social interaction along the Chicago River and the creation of the Chicago Riverwalk.*

# Financial Summary

The MWRD maintains a strong financial position with a AAA bond rating from Fitch Ratings and a AA+ bond rating from Standard & Poor's.



The MWRD performs incredibly important services for more than 5.25 million residents in Cook County, while striving to add value to that meaningful work at less than the cost of other utilities. Our task of treating 1.47 billion gallons of wastewater per day is critical to protecting public health and providing this service at an affordable rate is an added bonus to the communities we serve. Fitch Ratings highlighted the MWRD's role providing an essential service for the third largest metropolitan area in the country. Projected capital expenditures between 2018 and 2022 total $1.1 billion, which Fitch Ratings said, "equates to a very manageable approximately $70 per customer" living in the MWRD's 882.1-square mile-service-area.

A single-family residence across the country paid an average of $504 per year in 2018 for wastewater collection and treatment, also known as the sewer service charge, according to the National Association of Clean Water Agencies (NACWA) 2018 Cost of Clean Water Index. By contrast, the MWRD sewer service charge was $378.50. This average calculation of MWRD sewer service charge is based on the total levy divided by Equalized Assessed Valuation (EAV) of property within the MWRD's corporate limits as it applies to a home with an average value of $317,795.

Sewer service, however, is only part of the value that the MWRD provides to its constituents every day. In addition to meeting treatment obligations at our seven water reclamation plants (WRPs), managing stormwater for Cook County, completing vast Tunnel and Reservoir Plan (TARP) projects and maintaining navigable waterways, we also add value in unique ways:

- We have distributed more than 70,000 free tree saplings since April 2016 to assist in managing future stormwater.



- We have entered into agreements with local municipal partners and the Cook County Land Bank Authority to acquire 90 properties.



**70,000** FREE SAPLINGS *Distributed*

**5.25** MILLION *Residents Served*

**753** POUNDS *Drugs Collected*

**3,189** YARDS OF DEBRIS *Removed From Waterway*

**1.47** BILLION GALLONS *Wastewater Treated Daily*

- We generate approximately $23 million in income from real estate leases and easements, while also leasing land for a nominal fee to local park districts, forest preserve districts and municipalities to increase recreational access along the waterways.
- We are participating in groundbreaking research to understand the microbial health and composition of area waterways.
- We are performing more than 517,000 lab tests at the seven WRPs in 2020 that include chemical, biological and microbiological monitoring to improve operations and ensure the quality of local waterways and the biosolids we produce.
- We are managing a dynamic resource recovery program, capturing renewable energy from our own systems and reducing greenhouse gas emissions through new energy-efficient infrastructure.
- We utilize a strong asset management plan to maintain our facilities in an economically and environmentally sustainable manner.

The MWRD's 2020 budget is $1.15 billion. This supports day-to-day operations and general expenditures, bond redemption and interest, the MWRD's Retirement Fund, stormwater management activities, insurance and a Capital Improvement Program for designated projects and pay-as-you-go capital projects. The MWRD's current operations are funded primarily through property tax receipts. Other revenue sources include user charge revenues, personal property replacement tax receipts and land



rentals. The Capital Improvement Program is funded primarily through State Revolving Fund loans and general obligation bond sales. Guided by robust financial policies, the MWRD preserves a Corporate Fund reserve to provide for unexpected shortfalls in revenue or economic uncertainty. The MWRD is also committed to increasing the Retirement Fund funded ratio to 100 percent by 2050 and Other Postemployment Benefits Trust (OPEB) to a 100 percent funded ratio by 2027. The 2020 budget includes a planned equity transfer of $20 million to the Retirement Fund to provide advance funding to maintain growth in the Retirement Fund's funded ratio and a $5 million contribution to the OPEB Trust Fund. The MWRD also updated its Investment Policy in late 2019 to incorporate sustainability factors when evaluating investments. These investments ensure the long-term financial health of the MWRD. ✶

### WHERE MWRD MONEY COMES FROM



| | | |
|---|---|---|
| $462.0 M | 40.1% | Net Assets Appropriated |
| $328.2 M | 28.5% | Net Tax Sources |
| $230.2 M | 20.0% | State Revolving Fund Loans & Future Bond Sales |
| $43.0 M | 3.7% | User Charge Income |
| $35.9 M | 3.1% | Miscellaneous |
| $23.0 M | 2.0% | Land Rentals |
| $15.8 M | 1.4% | Grants |
| $12.7 M | 1.1% | Investment Income |
| $1.0 M | 0.1% | Sewer Permit Fees |
| **$1,151.8 M** | **100.0%** | **TOTAL** |

### WHERE MWRD MONEY GOES



| | | |
|---|---|---|
| $287.8 M | 25.0% | Construction & Design |
| $233.0 M | 20.2% | Bond Redemption & Interest Fund |
| $204.4 M | 17.7% | Plant Operations & Maintenance |
| $136.8 M | 11.9% | Staff Services |
| $116.3 M | 10.1% | Stormwater Management |
| $107.3 M | 9.3% | MWRD Retirement Fund |
| $34.4 M | 3.0% | Claims & Judgments |
| $31.8 M | 2.8% | Monitoring & Research |
| **$1,151.8 M** | **100.0%** | **TOTAL** |

**TAX LEVY** The overall 2020 tax levy is estimated at $652.6 million, an increase of $9.3 million, or 1.4 percent, from the 2019 adjusted levy.

**TAX RATE** The overall estimated tax rate for 2020, based on the most recent equalized assessed valuation, totals 39.48 cents per $100 of assessed property value, a decrease of 62 cents from the 2019 adjusted rate.

**For a $100,000 home, the 2020 estimated MWRD tax is $114.84, a decrease of $1.42 from the 2019 adjusted estimated tax.**

OUR HISTORY

# Reversing the Chicago River, Revitalizing a Community

Although the MWRD's name has changed a few times and the scope of our work has expanded, the quality of service remains the same. Today's projects are as ambitious as they were more than 100 years ago, making profound impacts both locally and across the entire region.

Managing today's water invokes an incredible need for the expertise of the MWRD, but it was the dire conditions of the local water environment in the 19th century that first demanded our services.

As a response to a public health crisis coupled with the city's exponential growth, the MWRD was originally organized as the Sanitary District of Chicago in 1889 under an act of the Illinois General Assembly. The enabling act was in direct response to contamination of the Lake Michigan water supply and nuisance conditions of the rivers. During that time, a polluted river flowed directly into the lake and caused waterborne illnesses. The Sanitary District's first priority became reversing the flow of the Chicago and Calumet River Systems to prevent the discharge of sewage into Lake Michigan. The water instead discharged into the Des Plaines River where, it could dilute as it flowed into the Illinois River and eventually the Mississippi River. To make this happen, the Sanitary District's dedicated staff constructed a 61.3-mile-system of canals and waterway improvements. The canals cut through the subcontinental dividing ridge, allowing the river to flow by gravity away from the lake and down a steeper slope. Workers blasted, dug and hauled heavy rock and deepened, straightened and widened waterways to convey sewage and stormwater to improve the quality of area waters.




*The MWRD was created to protect the region's drinking water supply across the city's front yard in Lake Michigan, but east under the DuSable Bridge and downstream along the Chicago River, the MWRD has also made a major impact safeguarding the city's attractive backyard, and ensuring Chicago's status as a world-renowned city with its unmistakable water resources.*

The agency's first projects, reversal of the Chicago and then the Calumet River, were engineering marvels that not only improved environmental conditions but also helped to distinguish the agency around the world. The monumental achievements set a tone of impressive environmental engineering accomplishments and scientific breakthroughs. From there, the Sanitary District built intercepting sewers, pumping stations and water reclamation plants to clean water. The agency's mission grew from protecting the lake to creating a new flourishing waterway system. These early advancements were followed by a century of innovation in water treatment technology. These early projects were effective and also well documented. The engineers surveying the property and construction activities also photographed their work, leaving behind an archive of 14,000 images.

From 1955 through 1988, the District was called the Metropolitan Sanitary District of Greater Chicago. In order to provide a more accurate perception of functions and responsibilities, the name was changed again in 1989 to the Metropolitan Water Reclamation District of Greater Chicago. Over that time, we went on to construct tunnels and reservoirs, aeration stations, nutrient recovery facilities and green infrastructure projects. We now operate the world's largest water reclamation facility, the world's largest nutrient recovery facility, the world's largest wastewater treatment ultra-violet (UV) installation, and the world's largest combined sewer reservoir.

Today, the MWRD is working to reduce the impact of flooding while also recovering resources. In its daily role, the MWRD strives to protect the health and safety of the public throughout a 882.1-square-mile service area across Cook County, protecting the quality of the water supply source in Lake Michigan, improving the quality of water in watercourses in its service area, protecting business and homes from flood damages, and managing water as a vital resource for the area. The MWRD serves an equivalent population of 10.35 million people each day, including 5.25 million residents of Chicago and 128 suburban communities, 4.5 million in the commercial and industrial sector, and a combined sewer overflow equivalent of 0.6 million people. ✶





*Sanitary District of Chicago employees sitting on a dipper dredge bucket in 1899 during construction of a bypass channel on the South Branch of the Chicago River. This groundbreaking work led to the creation of the Chicago Area Waterway System and the reversal of the Chicago River to protect the region's water environment.*

ESSENTIAL SERVICES

# Treating Water and Protecting a Region's Health

Every day, the MWRD treats an average of 1.47 billion gallons of water after it goes down drains, leaves households and industrial and commercial facilities, and runs off streets and sidewalks.

With a total treatment capacity of more than 2 billion gallons, the MWRD collects, cleans and returns that water to the environment in a matter of hours. The efficient manner in which the MWRD works is a crowning achievement in a rich history that strives to protect public health and the environment. Annually the National Association of Clean Water Agencies (NACWA) honors MWRD water reclamation plants (WRPs) for meeting decades of compliance in National Pollutant Discharge Elimination System (NPDES) permit requirements and federal Clean Water Act standards.

The MWRD owns and operates seven WRPs. One of these is the Stickney WRP, the world's largest for full secondary treatment by volume. The MWRD also owns and operates 560 miles of intercepting sewers, which are larger sewers that receive flow from approximately 10,000 local sewer system connections, and force mains, which are pipes that move water under pressure by using pumps or compressors. The WRPs mimic the purification process that occurs naturally in rivers, condensing what would take one or two weeks to less than 12 hours. Once considered waste, the discarded water that flows to our plants for treatment is now considered a collection of resources to be recovered and reused beneficially. In addition to cleaning water for reuse and discharge into our waterways, the process works to recover solids and nutrients that are beneficially returned to the environment. The process also strives for energy efficiency, energy generation and recovery to reduce greenhouse gas emissions, promote a more sustainable society, generate savings for taxpayers and enhance our water treatment operation. ✶

**CURRENT AVERAGE FLOW TO WATER RECLAMATION PLANTS**

| Stickney | Calumet | O'Brien | Kirie | Egan | Hanover Park | Lemont |
|---|---|---|---|---|---|---|
| Cicero | Chicago | Skokie | Des Plaines | Schaumburg | Hanover Park | Lemont |
| 816.83 MGD | 307.75 MGD | 256.92 MGD | 47.78 MGD | 27.19 MGD | 8.9 MGD | 2.95 MGD |

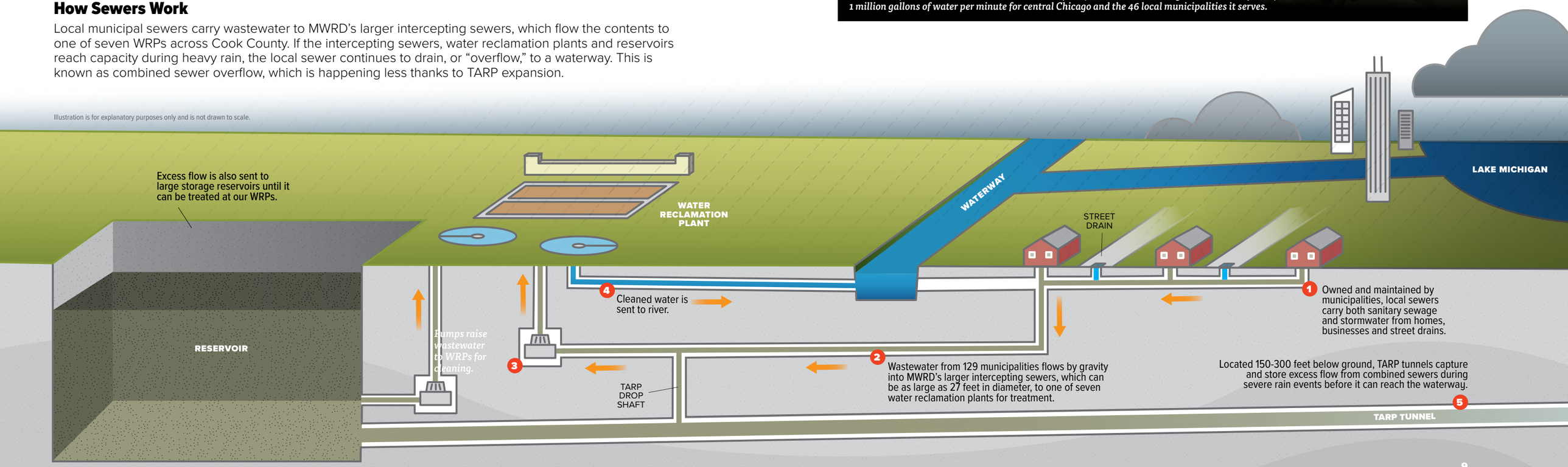


*The Stickney Water Reclamation Plant has the capacity to treat 1.44 billion gallons of water per day, or 1 million gallons of water per minute for central Chicago and the 46 local municipalities it serves.*

## How Sewers Work

Local municipal sewers carry wastewater to MWRD's larger intercepting sewers, which flow the contents to one of seven WRPs across Cook County. If the intercepting sewers, water reclamation plants and reservoirs reach capacity during heavy rain, the local sewer continues to drain, or "overflow," to a waterway. This is known as combined sewer overflow, which is happening less thanks to TARP expansion.

Illustration is for explanatory purposes only and is not drawn to scale.



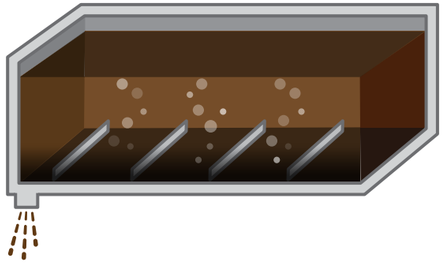
## Water Treatment Process

The WRPs mimic the purification process that occurs naturally in rivers, condensing what would take one or two weeks to less than 12 hours.



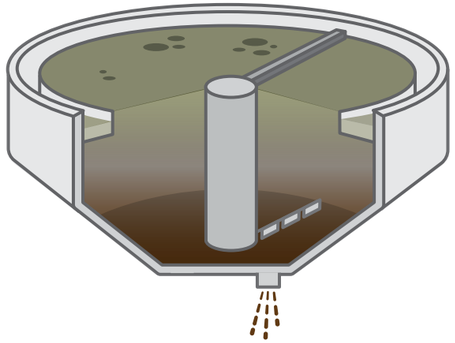

### 1. PRELIMINARY TREATMENT: COARSE SCREEN

A screening process utilizes large combs that rake through coarse screens to remove large objects which are deposited on conveyor belts and taken to landfills. The screens are a first line of defense to protect pumps from items that range from unwanted trash to huge tree limbs.



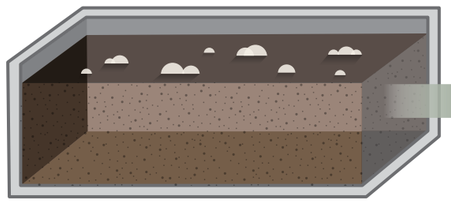
### 2. AERATED GRIT TANK

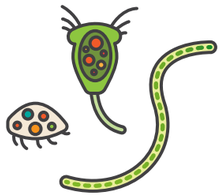
Next, pumps move water to aerated grit tanks. The air bubbles keep lighter materials suspended, while grit, sand and gravel sink to the bottom. A conveyor scrapes the larger material on the bottom into a drain. It is then taken to a landfill.



### 3. PRIMARY TREATMENT

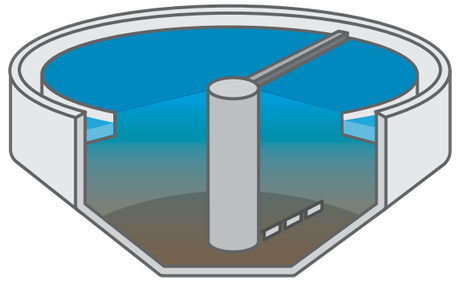
The water now flows into primary settling tanks. A revolving conveyor with slats skims off the floating fats and oils while solids settle to bottom. The slats push the solids to a drain so that they can be conveyed to a solids treatment process. The floating fats and oils are moved to a drain and then they are sent to a landfill.





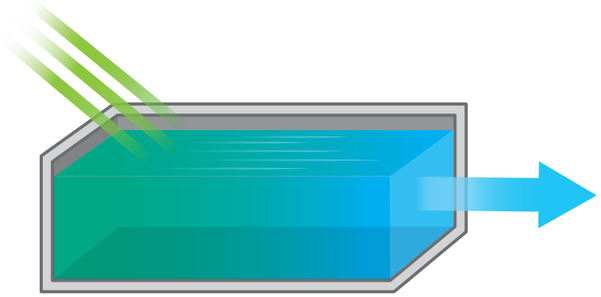
### 4. SECONDARY TREATMENT

Next, water enters the aeration tanks that receive pumped, filtered air and a carefully maintained population of microorganisms, collectively called “activated sludge.” These organisms break down the remaining suspended solids and remove soluble organics, ammonia, and, at some WRPs, phosphorus, and aggregate themselves to settle in the final settling tank.



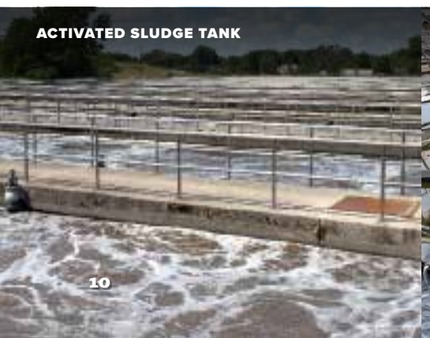
### 5. FINAL SETTLING TANK

In the final settling tanks, liquid from aeration tanks flows by gravity through the center of the tank. Solids sink to the bottom where revolving blades scrape them into a drain. About 97 percent of the solids are sent back to aeration tanks, while the remainder is sent to solids treatment process. The water at the top of the tank is now clean and ready for discharging to the waterway or tertiary treatment.



### 6. TERTIARY TREATMENT

During disinfection, the MWRD uses a variety of measures at different WRPs to add a final layer of treatment before water is released into neighboring waterways. The DNA of microbes are deactivated using a chlorination/de-chlorination application process or an ultraviolet (UV) light disinfection system that prevents them from reproducing or growing. These disinfection processes drastically improve the microbial quality of the water produced by the MWRD.


ACTIVATED SLUDGE TANK


SETTLING TANK


ULTRAVIOLET DISINFECTION



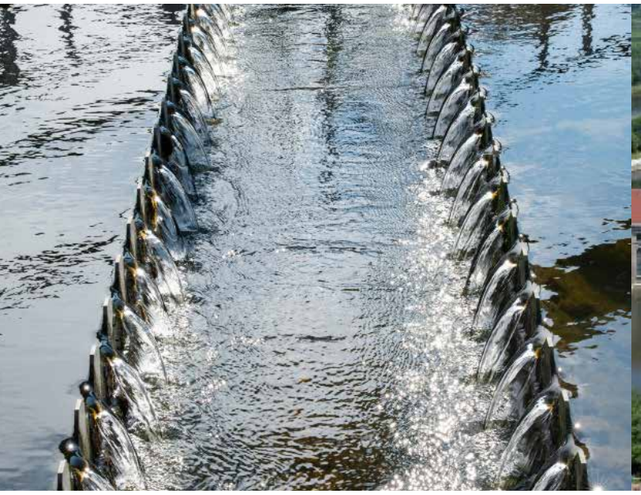
### WEST SIDE PRIMARY SETTLING TANKS

In 2018, the MWRD constructed nine 160-foot diameter primary settling tanks (PST) and six 132-foot long aerated grit tanks, associated support facilities, service tunnels and conduits at the Stickney WRP. These new tanks and treatment equipment replaced labor-intensive tanks that had been in use since 1928. This major upgrade provides a significant increase in digester gas production that will cover energy costs. The new tanks also increase and improve grit removal, protecting downstream piping and equipment, and reduce water recycling as well as odors that will be better captured and removed to support our goal of being a responsive neighbor to the communities we serve.

# Recovering Resources, Transforming Water and Protecting the Environment

For 130 years, the MWRD has been protecting the water environment. In that time, the agency's view of water has evolved. We now see water as a collection of raw resources to be recovered and reused.

With new technology came new awareness and new opportunities to rethink and reuse many beneficial resources, and today we are making those visions a reality. The MWRD produces clean water as well as sustainable resources like biosolids, energy and nutrients like phosphorus that are increasing in scarcity and value. Resource recovery is a new frontier that provides both a return on investment that benefits taxpayers and the environment.









## WATER

The MWRD returns treated water to the water cycle for reuse in many forms. In the future, changing economics may make it beneficial to distribute treated water for industrial use, cooling, or irrigation. When used appropriately, recycled water can satisfy many water demands. It presents financial savings while promoting water conservation resulting in the decrease of water withdrawals from Lake Michigan. In addition to being harnessed, water itself is also reused directly throughout the MWRD treatment process. Every day, 15.1 million gallons are reused in pipeline flushing, blower motor cooling, post-centrifuge centrate flushing and tank cleaning. The MWRD is producing cleaner water for reuse than previous generations, thanks to new MWRD innovation and the MWRD's Industrial Waste Division that controls pollutants, such as metals, that were formerly discharged back into the environment due to industrial uses.

## ENERGY

Water is a meaningful source of energy. At our Lockport Powerhouse where the Chicago Sanitary and Ship Canal drops 38 feet into the Des Plaines River, hydroelectric power is generated and converted to clean, renewable electricity. It is one of dozens of measures that the MWRD is taking to control our energy future. For decades, we have been creating clean, renewable energy from organic material removed from the wastewater. Biogas that is produced in anaerobic digesters is used to fuel boilers which produce steam or hot water to heat buildings and processes at the WRPs. This renewable biogas offsets the need to purchase about 6 million therms of natural gas each year. We have been pursuing energy reduction activities, including complete building energy assessments, and optimizing the aeration processes through implementation of new sensor and computerized control technology.

**PHOTOS** (left to right): *Water flows over a weir during treatment; the MWRD's Lockport Powerhouse has been generating hydroelectric power since 1907; MWRD solids are blended with windrow turners to create a premium quality compost product; a MWRD lab technician experiments with algae at the O'Brien Water Reclamation Plant.*



## FULTON COUNTY

Although the MWRD's daily service area is confined to Cook County, we actively work with the agricultural community and other stakeholders throughout the state to ensure water leaving our communities is not negatively impacting communities downstream. In keeping with our mission, and to be a good neighbor, the MWRD makes land it owns in Fulton County available to the agricultural sector, Illinois Farm Bureau and University of Illinois. The land serves as a live laboratory for conducting research and demonstrations for farmers to see best management practices and strategies to reduce nutrient loss on land that closely resembles actual farming operations. Point sources of nutrient discharge, like WRPs, and non-point sources, like the farming community, must work together to help the state meet national reduction goals for nutrient loss contributing to the hypoxic zone in the Gulf of Mexico, where oxygen levels are being depleted from the excess nutrients. The MWRD initially purchased the 13,500-site in 1970 to convert the former strip-mined land from a brownfield to a fertile farmland, as part of the award winning "Prairie Plan."



## BIOSOLIDS

The recovery of biosolids also presents a savings in energy costs, especially if we can reuse the soil amendment locally, cutting down on energy costs and carbon emissions to haul the product hundreds of miles away to what were formerly landfills. As the dried organic matter that is settled out of the treatment process, biosolids can be recycled and used as an alternative to chemicals and applied to improve and maintain productive soils and stimulate plant growth. The MWRD produces approximately 145,000 tons of biosolids annually, and 98 percent of all biosolids products are beneficially reused. The MWRD's composted biosolids and air-dried biosolids meet the USEPA's Exceptional Quality (EQ) standard. The MWRD makes the EQ Compost available to the public and has provided biosolids to area golf courses, parks and athletic fields for decades. The savings from transportation costs through distribution of biosolids has allowed us to supply this beneficial compost for free.

## NUTRIENTS

Recovering nutrients like phosphorus and nitrogen can make them available for reuse while protecting our waterways from contamination. In 2016, our Stickney WRP opened the world's largest nutrient recovery facility that helps protect waterways by removing phosphorus previously released into the waterways. The facility recovers phosphorus and ammonia in the form of a slow-release, environmentally friendly fertilizer. We also utilize a nitrogen removal system at our Egan WRP that lowers the plant's carbon footprint through a deammonification process. In addition, we are researching the sustainability of growing algae in a "vertical revolving" fashion to recover nutrients; this reduces the footprint to grow an equivalent algae biomass in a surface pond and simplifies the harvesting process. ✶

*A solar-powered aerator floats to the surface of water stored in the Thornton Composite Reservoir. Since becoming operational in 2015, the reservoir has prevented more than 20 billion gallons of combined sewage from entering the waterways. In 2018, there were no overflows in the Calumet River System, thanks to the reservoir.*



# Tunnel and Reservoir Plan (TARP) Mitigates Flooding and Improves Water Quality

The MWRD does nothing small. We are heading into the final decade of the nation's largest public works project for improving water quality.

The Tunnel and Reservoir Plan (TARP) works to mitigate flooding and reduce pollution in area waterways by providing storage for billions of gallons of water that formerly overwhelmed our streets, basements and riverbanks. It is needed now more than ever.

The MWRD and partners devised TARP in the late 1960s to capture combined sewer overflows (CSOs) that harm the environment and adversely impact water quality. CSOs occur when the MWRD's intercepting sewers and WRPs reach capacity during heavy rain, causing local sewers to drain to waterways. On schedule to be completed by 2029, TARP will provide more than 17.5 billion gallons of storage capacity for combined sewer systems in a 375-square-mile-area covering Chicago and 51 suburbs. As a result of TARP and other water quality enhancements, aquatic life is thriving in Chicago area waterways and area residents now see the river system as a major asset. TARP was the first system of its kind to address pollution and flooding problems and is now being emulated by cities around the US and the world, in places such as London, Singapore, and Vienna.

The TARP system, commonly known by Chicago area residents as "Deep Tunnel," is comprised of a network of four tunnel systems and three cavernous reservoirs designed to hold untreated water until it can be cleaned at MWRD water reclamation plants. The 109 miles of tunnels, which were completed in 2006, can be as wide as 33 feet in diameter and 240 to 300 feet below ground. In 2015, the MWRD completed the world's largest combined sewer reservoir at the 7.9-billion-gallon Thornton Composite Reservoir. It will be surpassed in size when the 10-billion-gallon McCook Reservoir is completed in 2029.

The Grand Canyon of the south suburbs, the Thornton Composite Reservoir is so large that it could store 144 million rain barrels, enough to circle the earth 3.64 times when laid end to end. When completed, the McCook Reservoir will be able to hold another 182 million rain barrels, 55 gallons each. McCook Reservoir will be large enough to cover every square foot of the Loop in nearly 10 feet of standing water.

While the sheer size of these reservoirs and tunnels is impressive, so too is the impact of this infrastructure on area water quality and flood prevention. After the tunnels were brought into service, the average number of yearly combined sewer overflows (CSOs) were cut in half. The Thornton Composite Reservoir and the 350-million-gallon Majewski Reservoir in the northwest suburbs have gone a step further and nearly eliminated CSOs. The Calumet TARP system has captured billions of gallons of CSO volume, more than 99 percent of the volume of water that enters the system since the reservoir was placed into service. Stage I of McCook Reservoir, completed in 2017, is fully operational and can take on 3.5 billion gallons of water that previously overflowed throughout its massive 255-square-mile area. In its first two years of operations, McCook captured more than 50 billion gallons of water.

Since 1998, the Majewski Reservoir and the related TARP system have yielded more than $400 million in flood damage reduction benefits to the three communities it serves. The Thornton Reservoir and Calumet TARP system provide an estimated $40 million per year in benefits to 556,000 people in 14 communities. Stage I of McCook is estimated to provide an average of $114 million per year in flood reduction benefits to 3.1 million people. Stage II of McCook Reservoir will provide another 6.5 billion gallons of storage, delivering an estimated total of $143 million per year in flood reduction benefits. ✶

### MCCOOK RESERVOIR

Stage I of TARP's McCook Reservoir can hold up to 3.5 billion gallons of water during major storms to save the MWRD from having to reverse water back out to Lake Michigan and save on energy costs that accrue when pumping water during heavy rains. The McCook Reservoir protects Chicago and 36 suburban communities from flooding and relieves each municipality of the burden of designing, building and operating its own system to capture and treat combined sewer overflows. Providing an outlet for two tunnel systems known as Mainstream and Des Plaines, the McCook Reservoir covers a wide footprint of protection from Kenilworth on the north and southwest to Bedford Park. The stored water is pumped from the reservoir to the Stickney Water Reclamation Plant to be cleaned and released.





FINDING RELIEF

# The MWRD Delivers Solutions for Managing Stormwater and Building a Resilient Cook County



*The underground structure below Wescott Park in Northbrook keeps the community dry by storing water while also conserving and harvesting water to be reused to irrigate park fields.*

Water can be elusive and destructive. Before the MWRD can clean it, this water must first be collected. In recent years, the Chicago region has experienced historic weather patterns consisting of rain bursts that overwhelm local collection systems, making flooding a priority issue at the MWRD.

Given the region's flat terrain, impervious pavement, large population and history of flooding, our role in stormwater management has intensified. The MWRD's expertise in water pollution control and drainage led us to assume a flood control leadership role in the metropolitan area. After designing and constructing more than 30 flood control storage reservoirs and dozens of stream improvement projects, the MWRD became a natural fit to lead this charge against flooding. In 2004, the Illinois General Assembly enacted legislation formalizing and expanding the MWRD's role as the regional stormwater management agency for Cook County. Through this authority, the MWRD began planning design, construction, operation and maintenance of flood control facilities and related stormwater management projects. The new countywide authority required the MWRD to form six watershed planning councils and develop the Cook County Stormwater Management Plan. Approved by the MWRD's Board of Commissioners in 2007, this plan identifies the goals of the program, the guidelines for the detailed watershed plans, the parameters of the countywide program, and plan implementation. It also introduces regulatory concepts later addressed in the Watershed Management Ordinance (WMO). Adopted in 2013, the WMO regulates sewer construction within MWRD's service area and development within suburban Cook County. The WMO provides guidelines for improving stormwater drainage and detention conditions for new development. It also ensures protection of wetlands and riparian areas, reduces soil erosion and prevents future development projects from exacerbating flooding.

Stormwater management allows the MWRD to look at projects holistically, like in Robbins where a community partnership has leveraged new opportunities for economic, social, environmental and recreational growth. It has also spawned collaborative efforts between the MWRD and local partners through major projects, such as the Addison Creek Reservoir and Channel improvements that will benefit Northlake, Melrose Park, Stone Park, Bellwood, Westchester and Broadview by reducing flooding to approximately 2,200 structures along Addison Creek. Other projects such as expansions of Buffalo Creek Reservoir near Buffalo Grove and Melvina Ditch Reservoir in Burbank will benefit hundreds of homes and businesses, much like the impacts experienced from the MWRD's Heritage Park Flood Control Facility in Wheeling. Flood control and streambank stabilization projects at Cherry Creek in Flossmoor and Tinley Creek in Crestwood will improve conveyance and protect communities, while the Albany Park Stormwater Diversion Tunnel will relieve this Chicago neighborhood from the threat of catastrophic 100-year flood events that occur with more regularity.



*Space To Grow*

The MWRD's stormwater management program also expedites smaller, shovel-ready projects that protect Cook County communities from flooding. The MWRD Board of Commissioners authorized plans in 2018 to assist various local municipalities and other governmental organizations on 14 projects that represent approximately $66.8 million in estimated construction costs, benefiting more than 2,000 affected structures impacted by flood waters. We held another call for projects in early 2020.

In addition, the MWRD is working with local communities to provide partial funding towards the construction of green infrastructure (GI) installations on public property. GI projects are designed to use natural landscaping to manage water and provide environmental and community benefits.

Today, the MWRD has nearly 100 stormwater management projects in design or construction to create new resilient communities. These projects incorporate elements of both gray and green infrastructure, ranging in size between massive reservoirs to green alleys and permeable parking lots. Other ambitious programs include improving Chicago schoolyards to better manage water through a partnership known as Space to Grow and a flood-prone property acquisition program that removes homes built in the floodplain. We have also distributed more than 130,000 rain barrels and 70,000 oak tree saplings to offset the regional loss of ash trees and soak up more stormwater. We realize that we each can play a role diminishing our stormwater challenges. ✶




*The MWRD promotes green infrastructure projects that use natural landscaping to manage water.*



*Skokie Police Station Headquarters can now retain 33,000 gallons of stormwater thanks to support from the MWRD.*



*Rain barrels can be ordered on the MWRD website and delivered to your door.*

# A Neighbor You Can Count On

Protecting our water environment requires commitment, expertise, innovation and a relentless drive to be the best in the industry, but the MWRD cannot accomplish this alone.

That is why we also strive to be a responsive neighbor that engages with the public on several critical water-related issues that improve the quality of life for all. Along with recovering resources and transforming water, the MWRD utilizes innovation to reduce greenhouse gas emissions, but our impact extends far beyond these daily activities. Here are only a few actions we take throughout the year to add value to the daily integral services we provide as a utility of the future.

## COMMUNITY OUTREACH

We host thousands of visitors for tours of our water reclamation plants, pumping stations and other facilities to educate and also encourage the public's participation in helping us protect our water environment. We hold open houses for all ages, distribute EQ Compost and free oak tree saplings, and participate in outreach events to educate the public about the importance of protecting our water environment. Our Board of Commissioners and talented staff of scientists, engineers and water experts are speaking in our communities and classrooms and taking leadership roles in professional organizations.



## UNWANTED MEDICATION AND CONTAMINANTS

Throughout the year, the MWRD collects unwanted medicine to prevent it from entering our water environment. Working with the medical community, government agencies and the general public, the MWRD has sought ways to reduce the release of pharmaceutical waste into the environment and issue reminders not to flush unused medications down the drain, nor toss expired drugs in the garbage. In 2019, we collected more than 750 pounds of unwanted medicine at our drug collection boxes, partnering with the Cook County Sheriff's Office and participating in the U.S. Drug Enforcement Administration's National Prescription Drug Take Back Day. We also coordinate a stakeholder group to address chloride levels in area waterways and educate the public on the damaging effects of microbeads, pesticides and waste runoff that can harm our water environment.





*The MWRD in 2018 gave more than 150 group tours of our plants and facilities, including numerous international visits to educate thousands of visitors on our integral work and empower them to join us in our efforts to protect our water environment.*



*MWRD dedicated land and delivered an 11-mile segment of the Centennial Trail through the Columbia Woods Forest Preserve in Willow Springs*

## PARTNERSHIP AND COLLABORATION

We improve public recreation spaces on MWRD-owned land to draw more people closer to the waterfront. We also provide ample open spaces next door to our plants and at the site of stormwater management projects that work to manage excessive stormwater and increase recreational opportunities. In fact, the MWRD dedicated half of the land on which the 13-mile Cal-Sag Trail was built, allowing access to our waterways and greenspace, and we were also instrumental in dedicating land and delivering an 11-mile segment of the Centennial Trail through the Columbia Woods Forest Preserve in Willow Springs. Unique hills for the trail were constructed as part of the removal of 1.8 million cubic yards of overburden (dirt) from the neighboring McCook Reservoir. Our impressive real estate portfolio also ushers in a financial return for taxpayers while addressing our mission of stormwater management and riverfront access.



*MWRD aquatic biologists and research technicians survey the Chicago Area Waterways to study fish populations.*

## SERVICE EXCELLENCE

We alert the public to combined sewer overflows and encourage citizens to minimize water use on rainy days to reserve space in the sewers. We are responsive and have a sense of urgency when the public informs us of waterway pollution, dumping, blockages and odors through our online Citizen Incident Reporting (CIR) application and our 1-800-332-3867 CIR hotline that also caters to Spanish speakers at 1-855-323-4801. The MWRD is investing millions of dollars in new odor control technologies. We are working with environmental partners to establish new goals in reducing nutrients to create cleaner waterways locally and downstream to the Gulf of Mexico. We are also increasing the recovery of valuable nutrients like phosphorus that has grown scarce throughout the world. We are documenting and analyzing an increasing diversity of fish species in the waterways. We are planting native prairie landscaping to show strong land stewardship, reduce the long-term cost of grounds maintenance, and serve as an example of a best management practice to infiltrate stormwater, increase biodiversity and wildlife habitat, and sequester carbon. We are offering affordable rain barrels that capture rainwater and prevent it from entering and overwhelming our collection systems. We are distributing free oak tree saplings to help restore the canopy of trees that has been threatened in recent years.

Water can be taken for granted. When it is poured down drains, it can be forgotten. But water plays a vital role in all of our lives, so the MWRD works around the clock to make a better environment now and for future generations. Sometimes it is our actions that speak louder than words, and it is these actions that make the MWRD the utility of the future you can rely on every day. ✶

## Board of Commissioners

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**Metropolitan Water Reclamation District of Greater Chicago**

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## Visit our facilities.

To schedule a tour, call 312.751.6333 or email tours@mwrd.org.
Tours are offered for groups of up to 30 for visitors age 10 and older.

**mwrd.org**

Established in 1889, the MWRD is an award-winning, special purpose government agency responsible for wastewater treatment and stormwater management in Cook County, Illinois.

## Help protect our waterways and sewer systems.

Call our **1 (800) 332-3867** Citizen Incident Reporting hotline to report:

- Dead fish or other aquatic species
- Foul or suspicious odors
- Illegal or suspicious dumping to waterways or sewers
- Waterway blockages

(En Español: **1 (855) 323-4801**)

All calls are logged and routed 24/7.

Submit reports online using our Citizen Incident Reporting (CIR) form at mwrd.org. From the homepage, select the “Incident Reporting” icon.

**Get mobile** Download our free CIR app for iOS devices from iTunes to submit an incident from your mobile phone. Search for **MWRD CIR** or visit: **https://apple.co/2LTtEa8.**

## Think Inside the Box for unused medication disposal.

Never flush medications down the toilet or a drain. Instead, use one of our safe collection sites:

**Main Office Building**
100 E. Erie St., Chicago
Open Monday - Friday:
9 a.m. to 6 p.m.

**Calumet WRP**
400 E. 130th St., Chicago
Open seven days a week:
9 a.m. to 6 p.m.

**O’Brien WRP**
3500 Howard St., Skokie
Open seven days a week:
9 a.m. to 6 p.m.

**Stickney WRP**
6001 W. Pershing Rd., Cicero
Open seven days a week:
9 a.m. to 6 p.m.




Visit our website for a listing of medication collection sites located throughout Cook County.

**COVER PHOTO:** *The MWRD greenhouse at Stickney Water Reclamation Plant is an important research and development center for MWRD environmental soil scientists and other scientists learning how resources recovered from the treatment process can be sustainably returned to grow new plant life. The greenhouse is a popular destination for visitors touring the water reclamation plant.*