

**COOK COUNTY
MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN
VOLUME 2 - Municipal Annexes**

MWRD 2019 MJ-HMP Jurisdictional Annex

FINAL

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Prepared for:



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Hazard Mitigation Point of Contact

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Jurisdiction Profile

Origin and History

The Metropolitan Water Reclamation District of Greater Chicago (District) is an independent government and taxing body encompassing approximately 92 percent of the land area and 98 percent of the assessed valuation of Cook County, Illinois.

The District is a separate legal entity sharing an overlapping tax base with the City of Chicago, the Chicago Board of Education, the County of Cook, the Forest Preserve District of Cook County, the Chicago Park District, the Chicago Public Building Commission, the Cook County Community College District, and various municipalities and school districts outside the City of Chicago but within the District's boundaries.

The District was originally organized as the Sanitary District of Chicago in 1889 under an act of the Illinois General Assembly which has been modified from time to time to increase the District's authority and jurisdiction. The District's enabling legislation, enacted in 1889, was in direct response to a long standing problem with contamination of the water supply and nuisance conditions of Chicago area rivers. The District reversed the flow of the Chicago and Calumet River systems to stop the discharge of sewage into Lake Michigan and instead, discharge it to the Des Plaines River, where it could be diluted as it flowed into the Illinois River and eventually the Mississippi River. Prior to the District's construction of a 61.3 mile system of canals and waterway improvements, the Chicago and Calumet River systems were tributaries to Lake Michigan. These river systems are now tributaries to the Illinois River system.

From 1955 through 1988, the District was called The Metropolitan Sanitary District of Greater Chicago. In order to provide a more accurate perception of the District's current functions and responsibilities, the name was changed effective, January 1, 1989, to the Metropolitan Water Reclamation District of Greater Chicago.

Mission and Responsibilities

The mission of the District is to protect the health and safety of the public in its service area, protect the quality of the water supply source (Lake Michigan), improve the quality of water in watercourses in its service area, protect businesses and homes from flood damages, and manage water as a vital resource for its service area.

The District collects wastewater from municipalities in its service area, conveys it to water reclamation plants, provides full secondary treatment, and discharges treated water to local waterways. The District is also responsible for stormwater management for all of Cook County, including areas outside of the District's corporate boundaries.

Services

The District's seven modern water reclamation plants provide excellent treatment for residential and industrial wastewater, meeting permitted discharge limits virtually at all times. The treatment process is protected by a pretreatment program to guard against hazardous substances and toxic chemicals. These are strictly regulated pursuant to federal and state requirements. The District routinely monitors all industries and non-residential sources to assure that wastes are disposed of in an environmentally responsible and lawful manner.

Treated wastewater, along with runoff from rainfall, enters local canals, rivers, and streams that serve as headwaters of the Illinois River system. Stormwater in the separate sewer area is controlled to reduce flood damages by a number of stormwater detention reservoirs. In the combined sewer area, the District's Tunnel and Reservoir Plan has significantly reduced basement backups and overflows to local waterways.

Flow within the Chicago Area Waterway System and the Lake Michigan discretionary diversion flow are controlled by three inlet structures on Lake Michigan: the Wilmette Pumping Station, the Chicago River Controlling Works, and the O'Brien Lock and Dam. The single outlet control structure is the Lockport Lock and Powerhouse.

While exercising no direct control over wastewater collection systems owned and maintained by cities, villages, sewer districts, and utilities, the District does control municipal sewer construction by permits outside the City of Chicago. It also owns a network of intercepting sewers to convey wastewater from the local collection systems to the water reclamation plants.

Governance

The District is governed by a nine-member Board of Commissioners (Board). Commissioners are elected at large and serve on a salaried basis. Three Commissioners are elected every two years for six-year terms. Biannually, the Board elects from its membership a President, Vice President, and Chairman of the Committee on Finance.

Organization Structure

The Executive Director (ED) is appointed by and reports directly to the Board of Commissioners. The ED manages the District's day-to-day operations. Eight appointed Department Heads report to the ED. General Administration, which includes the Administrative Services Division, Diversity Section, and Public Affairs Section are direct staff and support units, reporting to the ED. There are nearly 2,000 employees that work for the District.

The Treasurer of the District, its chief financial officer, is appointed by and reports directly to the Board.

Tax Sources

All District funds, with the exception of the Capital Improvements Bond Fund, derive their revenues primarily from property taxes. Taxes levied in one year are collected in the next year, and Working Cash Funds for the Corporate, Construction, and Stormwater Management Funds provide temporary financing while awaiting property tax receipts. A personal property replacement tax provides income tax revenue from corporations, partnerships, and the invested capital of public utilities to replace the personal property taxes that were once received from these sources. These revenues, received directly from the State of Illinois, typically trend with the economy.

Funding Capital Projects: Bonds, Grants, and Loans

The District's Capital Improvement Program (CIP) is financed primarily with State Revolving Fund (SRF) loans and general obligation bond sale proceeds. Additionally, a series of Public Acts have provided further non-referendum authority to the District to issue "limited bonds". Bond sales are used to provide revenue for capital project cash flows. The District's debt is authorized under the Illinois Compiled Statutes. Appropriations and tax levies are adjusted for new bond sales or State Revolving Fund loans. The Capital Budget includes the Construction Fund and the Capital Improvement Bond Fund, which are described below.

User Charges, Property, Services, & Miscellaneous

Another major revenue source for the District is a user charge system, which imposes a surcharge above property tax payments for commercial, industrial, and tax exempt users of the sewerage system. Other sources of revenue include land rentals, investment income, sewer permit fees, connection impact fees, grants, and other miscellaneous revenues.

Funds to Control District Financial Activities

The District uses the following funds to control its financial activities:

- Corporate Fund: Accounts for property tax levies and other revenues used for the operations and payments of general expenditures of the District not specifically chargeable to other funds.
- Capital Improvements Bond Fund: Accounts for bond sale proceeds authorized by the Illinois General Assembly, government grants, and other revenues used for improvements, replacements, and additions to designated environmental improvement projects.
- Construction Fund: Accounts for a specific property tax levy and other revenues used for pay-as-you-go capital fund for the construction or replacement of long-term assets used in the principal functions of the District.
- Stormwater Management Fund: Accounts for property tax levies and other revenues, such as interest on investments and permit fees, for planning, implementing, and financing stormwater management activities throughout all of Cook County, including stream maintenance in areas that currently lie outside the District's boundaries.
- Retirement Fund: Accounts for a specific property tax levy to fund pension costs in accordance with statutory provisions. The taxes are collected by the District and paid to the Retirement Fund, a pension trust fund.

- **Bond Redemption & Interest Fund:** Accounts for property tax levies and interest on investments for the payment of principal and interest of general obligation bond issues. A sub-fund is created for each bond issue.
- **Reserve Claim Fund:** Accounts for a specific property tax levy and other revenues and pays for claims, awards, losses, or liabilities that might be imposed against the District and for the replacement or repair of damaged property. The accounts of the Reserve Claim Fund are included in the General Corporate Fund for financial reporting purposes.

Key Information

The following is a summary of key information about the jurisdiction:

- **Population Served**—The District serves an equivalent population of 10.35 million people; 5.25 million actual population, a commercial and industrial equivalent of 4.5 million people, and a combined sewer overflow equivalent of 0.6 million people.
- **Land Area Served**—The District is located primarily within the boundaries of Cook County, Illinois. The District's corporate limits encompass an area of 883.1 square miles which includes the City of Chicago and 125 suburban communities. The District also has authority for stormwater management for all of Cook County, including areas that lie outside the District's corporate limits, but within Cook County. The District's corporate limits are shown in Figure 1.
- **Value of Area Served**—The estimated value of the area served by the jurisdiction is 98 percent of the assessed valuation of Cook County, which is 92 percent of the land area.
- **Land Area Owned**—The District currently owns approximately 24,000 acres of land located in Cook, Will, DuPage, and Fulton Counties in Illinois and controls approximately 76 miles of navigable waterways, which include the Calumet-Sag Channel, Chicago Sanitary and Ship Canal (Main Channel), and the North Shore Channel. Additionally, the District has acquired rights-of-way and easements for the construction and installation of its facilities and structures upon, under, and through miles of real estate owned by other parties.
- **List of Critical Infrastructure/Equipment Owned by the Jurisdiction:**
 - A. The District's 560 miles of intercepting sewers and force mains range from 6 inches to 27 feet in diameter and have approximately 10,000 local sewer system connections.
 - B. The District's Tunnel and Reservoir Plan (TARP) is one of the county's largest public works projects for pollution and flood control. Four tunnel systems total 109.4 miles of tunnels, 9 to 33 feet in diameter and 150 to 300 feet underground. The tunnels empty into three reservoirs to provide storage for polluted water captured by TARP. Gloria Malitto Majewski Reservoir, Thorton Composite Reservoir, and Stage 1 of McCook Reservoir are in operation and construction is in progress on Stage 2 of McCook Reservoir for the Chicagoland Underflow Plan (CUP). The District's TARP system is shown in Figure 2.
 - C. The District owns and operates 23 pump stations.
 - D. The District manages 76.1 miles of navigable waterways which are part of the inland waterway system connecting the Great Lakes with the Gulf of Mexico. The navigable waterways are controlled by District infrastructure at the Wilmette Pump Station, the Chicago River Controlling Works, O'Brien Controlling Works, Lockport Powerhouse and Lockport Controlling Works. Sidestream Elevated Pool Aeration (SEPA) stations located along the navigable waterways provide dissolved oxygen to the waterways.

- E. The District operates 37 regional stormwater detention reservoirs located throughout Cook County. Two of the operating reservoirs are part of the TARP system. The other 34 reservoirs are shown in Figure 3.
- F. The District owns and maintains 6 dams in Cook County and 2 dams in Fulton County.
- G. The District's Small Streams Maintenance Program maintains 532 miles of stream, rivers, and canals within Cook County. The objective of the Program is to remove obstructions and debris in small streams and rivers that impede natural drainage and could cause flooding in urban areas.
- **Total Value of Critical Infrastructure/Equipment**—The value of critical infrastructure and equipment maintained, operated, or owned by the jurisdiction is provided in the table below.

TABLE: TOTAL VALUE CRITICAL INFRASTRUCTURE/EQUIPMENT			
Infrastructure/Equipment	Address	Quantity	Replacement Cost (2019 Dollars)
A. Intercepting Sewers	Throughout Cook County	554 Miles	\$17,584,908,891
B. TARP			
1. Tunnels	See TARP map	109.4 Miles, 2.305 BG	\$10,207,814,353
2. Gloria Alitto Majewski Reservoir	Elk Grove, IL	0.35 BG	\$76,281,574
3. Thornton Transitional Reservoir	Thornton, IL 60476	3.1 BG	\$110,089,034
4. Thornton Composite Reservoir	Thornton, IL 60476	7.9 BG	\$416,650,948
5. McCook Reservoir - Stage 1 McCook Reservoir - Stage 2	McCook, IL 60525	3.5 BG 6.5 BG	\$1,015,813,866 Under Construction
C. Pump Stations (PS)*			
1. Alsip PS*	4858 W. 115th Street, Alsip, IL 60803	1 Unit	\$633,640
2. Bartlett PS*	Devon Ave & Berteau Ave, Bartlett, IL 60103	1 Unit	\$15,238,429
3. Calumet TARP PS*	400 East 130th Street, Chicago, IL 60628	1 Unit	\$129,244,541
4. East Markham PS*	161st Street & Dixie Hwy, Markham, IL 60426	1 Unit	\$2,215,376
5. Evanston PS*	1455 Elmwood Ave, Evanston, IL 60201	1 Unit	\$25,040,187

6. McCook PS*	49th Street and Egandale Ave, McCook, IL 60525	1 Unit	\$1,636,559
7. North Branch PS*	4860 N. Francisco, Ave., Chicago, IL 60625	1 Unit	\$31,029,317
8. Palos Park PS*	76th Ave, Worth, IL 60482	1 Unit	\$3,570,940
9. Palos Hills PS*	90th Ave and 119th Street, Palos Park, IL 60464	1 Unit	\$1,903,043
10. Prospect Meadows PS*	Rand Road & Elmhurst Ave, Mt. Prospect, IL 60056	1 Unit	\$2,079,485
11. Racine Ave. PS*	Racine Ave & 39th Street, Chicago, IL 60609	1 Unit	\$215,954,680
12. TARP Mainstream PS*	5600 S. River Rd., Hodgkins, IL 60525	1 Unit	\$900,256,695
13. Thornton PS*	700 East Chicago Rd., Hodgkins, IL	1 Unit	\$1,872,546
14. Upper Des Plaines PS*	Thatcher & Greenfield Ave, River Forest, IL 60305	1 Unit	\$25,039,928
15. Walters Rd. PS*	4195 Walters Rd., Northbrook, IL 60062	1 Unit	\$2,778,859
16. Wellington PS*	2220 Wellington Ave., Chicago, IL 60618	1 Unit	\$4,185,929
17. Westchester PS*	1134 Gardner Rd., Westchester, IL 60154	1 Unit	\$24,128,357
18. Willow Springs PS *	91st St. & Wolf Rd., Willow Springs, IL 60480	1 Unit	\$1,142,803
19. Wilmette PS*	Sheridan Rd. & the North Shore Channel, Wilmette, IL 60091	1 Unit	\$51,341,322
20. 95th St. PS*	9512 S. Baltimore Ave, Chicago, IL 60617	1 Unit	\$9,334,803
21. 122nd St. PS*	12205 S. Burley Ave., Chicago, IL 60633	1 Unit	\$14,883,571
22. 125th St. PS*	125th St. & Michigan Ave., Chicago, IL 60628	1 Unit	\$6,052,617
D. Navigable Waterways – Chicago Area Waterway System			
1. Canals		76.1 Miles	N/A
2. Lockport Powerhouse	Lockport, IL	1 Unit	\$553,058,848

3. Lockport Controlling Works	Lockport, IL	1 Unit	\$91,042,768
4. Chicago River Controlling Works	Chicago, IL	1 Unit	\$206,456,676
5. O'Brien Controlling Works	Chicago, IL	1 Unit	Constructed by Corps of Engineers
6. Wilmette Gate	Wilmette, IL	1 Unit	Part of Pump Station, See C.19.
7. Centennial Fountain	400 N. McClurg Court, Chicago, IL	1 Unit	\$6,120,244
8. SEPA 1	North Side of Calumet River at Torrence Avenue, Chicago, IL	1 Unit	\$ 48,209,160 See D.9 & D.12.
9. SEPA 2	North Side of Little Calumet River at Indiana Avenue, Chicago, IL	1 Unit	Replacement cost is included with SEPA 1. See D.8.
10. SEPA 3	North Bank of Cal Sag Channel at Western Avenue, Blue Island, IL	1 Unit	\$51,940,782 See D.11.
11. SEPA 4	North Bank of Cal Sag Channel at Harlem Avenue, Worth, IL	1 Unit	Replacement cost is included with SEPA 3, See D.10.
12. SEPA 5	North Side of Cal Sag Channel at Rt. 83, DuPage County, IL	1 Unit	Replacement cost is included with SEPA 1. See D.8.
13. Devon Avenue In-Stream Aeration	North Shore Channel and Devon Avenue, Chicago, IL	1 Unit	\$15,159,591
14. Webster Avenue In-Stream Aeration	North Branch of Chicago River and Webster Avenue, Chicago, IL	1 Unit	\$9,715,294
E. Regional Detention Reservoirs			
1. Bedford Park Reservoir	Bedford Park, IL	188 AC-FT	Constructed by Village Bedford Park
2. Buffalo Creek Reservoir (Expansion of Reservoir)	Buffalo Grove, IL	720 AC-FT	\$10,849,693 Under Construction**
3. Calumet Union Reservoir	Hazel Crest, IL	500 AC-FT	\$38,066,062

4. Deer Creek Reservoir	Ford Heights, IL	238 AC-FT	Constructed by Corps of Engineers
5. Deerfield Reservoir	Deerfield, IL	575 AC-FT	Constructed by Corps of Engineers
6. Dolphin Park Reservoir	Streamwood, IL	96 AC-FT	\$2,7421,103 See E.10.
7. Dr. Mary Woodland Reservoir	Lynwood, IL	1076 AC-FT	\$20,538,449
8. Edward C. Howell Reservoir	Markham, IL	589 AC-FT	\$16,535,438
9. Heritage Park Reservoir	Wheeling, IL	151 AC-FT	\$38,493,825
10. Hillside Park Reservoir	Streamwood, IL	35 AC-FT	Replacement cost is included Dolphin Park Reservoir, See E.6.
11. Hillside Reservoir	Hillside, IL	100 AC-FT	\$7,032,487
12. Margreth Riemer Reservoir	Palatine, IL	572 AC-FT	\$35,495,992
13. Mayfair Reservoir	Westchester, IL	74 AC-FT	\$6,353,278
14. Melvina Ditch Reservoir	Burbank, IL	165 AC-FT	\$10,567,585
15. Middle Fork Reservoir	Northbrook, IL	600 AC-FT	\$23,579,838
16. Mount Prospect Reservoir	Mt. Prospect, IL	130 AC-FT	\$7,538,721
17. Northlake Reservoir	Northlake, IL	427 AC-FT	\$12,404,480
18. O'Hare/Touhy Avenue Reservoir	Des Plaines, IL	1178 AC-FT	\$42,139,037
19. Oak Hill Park Reservoir	Streamwood, IL	77 AC-FT	\$2,933,438
20. Oak Lawn Reservoir	Oak Lawn, IL	24 AC-FT	\$1,497,147
21. Plum Grove Reservoir	Palatine, IL	218 AC-FT	\$4,289,236
22. Silver Creek Reservoir	Franklin Park, IL	501 AC-FT	\$20,432,477
23. St. Michael Reservoir	Rolling Meadows, IL	407 AC-FT	\$15,115,942
24. Techny 32A (Northbrook) Reservoir	Northbrook, IL	300 AC-FT	\$23,770,793 See E.25 & E.26.

25. Techny 32B Reservoir	Northbrook, IL	250 AC-FT	Replacement cost is included with Techny A Reservoir, See E.24.
26. Techny 32C (Glenview) Reservoir	Glenview, IL	1040 AC-FT	Replacement cost is included with Techny A Reservoir, See E.24.
27. Tinley Park Reservoir	Tinley Park, IL	616 AC-FT	\$29,143,982
28. Tom T. Hamilton Reservoir	Palatine, IL	537 AC-FT	\$32,092,201
29. Twin Lakes Reservoir	Palatine, IL	429 AC-FT	\$12,588,802
30. Upper DuPage Reservoir	Hanover Park, IL	230 AC-FT	\$22,023,257
31. White Pine Ditch Reservoir	Wheeling, IL	65.5 AC-FT	\$2,025,304
32. Whilke Kirchoff Reservoir	Arlington Heights, IL	100 AC-FT	\$7,870,013
33. Willow-Higgins Reservoir	Chicago, IL	1300 AC-FT	Constructed by the City of Chicago
F. Dams			
1. Buffalo Creek Reservoir Dam	Buffalo Grove, IL	1 Unit	Part of Reservoir, See E.2.
2. Plum Grove Reservoir Dam	Palatine, IL	1 Unit	Part of Reservoir, See E.20.
3. St. Michael Reservoir Dam	Rolling Meadows, IL	1 Unit	Part of Reservoir, See E.23.
4. Twin Lakes Reservoir Dam	Palatine, IL	429 AC-FT	Part of Reservoir, See E.28.
5. O'Hare/Touhy Avenue Reservoir Dam	Des Plaines, IL	1178 AC-FT	Part of Reservoir, See E.19
6. Thornton Gap Dam	Thornton, IL		Part of Reservoir, See B.4.
7. Acid Lake Dam	Fulton, IL	70 AC-FT	Not in Cook County
8. Little Sister Dam	Fulton, IL	393 AC-FT	Not in Cook County
G. Rivers/Streams	Cook County	532 Miles	N/A
* Replacement cost for the pump station is only for the machinery and equipment.			

Current and Anticipated Service Trends

Based on the data tracked by the U.S. Census bureau, Cook County has experienced a negative growth rate of 3.39% from 2000-2010, and Cook County is currently experiencing a relatively slow negative growth rate of 0.3% from 2010-2018.

The District's commitment to the environmental quality of the region involves protecting Lake Michigan from pollution, maintaining public health and safety, protecting homes and businesses from flooding, and preserving water as a vital resource. As the stormwater management authority for Cook County, the District will continue to address flooding on multiple fronts through the administration of the Small Streams Maintenance Program, the Stormwater Management Capital Improvement Program, and the comprehensive stormwater management regulatory ordinance, known as the Watershed Management Ordinance.

The District's capital improvements projects preserve the useful life or increase the capacity or efficiency of District facilities or infrastructure. Capital projects involve the acquisition, improvement, replacement, remodeling, completion, alteration, construction, and enlargement of District facilities or infrastructure. Through proper operation, maintenance, repair, replacement, and new construction, the District ensures continued efficient and reliable service and protection of its investment and infrastructure, while meeting necessary permit requirements.

- **List of Critical Facilities Owned by the Jurisdiction:**
 - A. The District owns and operates 7 Water Reclamation Plants (WRP). The District treats an average of 1.3 billion gallons of wastewater each day, with a total treatment capacity of over 2.0 billion gallons per day.
 - B. District's Main Office Building, 100 East Erie, Chicago, IL
 - C. District's Main Office Building Annex, 111 East Erie, Chicago, IL
- **Total Value of Critical Facilities**—The total value of critical facilities owned by the jurisdiction are provided in the table below

TABLE: TOTAL VALUE CRITICAL FACILITIES			
Critical Facilities	Address	Quantity	Replacement Cost (2019 Dollars)
A. Water Reclamation Plants (WRPs)			
1. Stickney WRP	6001 West Pershing, Stickney, IL 60804	1 Unit	\$3,317,875,492
2. Calumet WRP	400 E. 130 Street, Chicago, IL 60628	1 Unit	\$1,832,108,134
3. Terrence J. O'Brien (North Side) WRP	3500 West Howard Street, Skokie, IL 60076	1 Unit	\$1,746,483,724

4. James C. Kirie WRP	701 W Oakton, Des Plaines, IL 60018	1 Unit	\$672,235,634
5. John E. Egan WRP	5560 S. Meachum Road, Schaumburg, IL 60193	1 Unit	\$550,527,870
6. Hanover WRP	1220 Sycamore Avenue, Hanover Park, IL 60103	1 Unit	\$190,733,930
7. Lemont WRP	13 Stevens and River Road, Lemont, IL 60437	1 Unit	\$84,673,298
B. LASMA - Solid Maintenance Area	7601 S. LaGrange Road, Willow Springs, IL 60480	1 Unit	\$5,479,663*
C. Main Office Building	100 East Erie, Chicago, IL 60611	1 Unit	\$42,725,022
D. Main Office Building Annex	111 East Erie, Chicago, IL 60611	1 Unit	\$31,138,299
Total			\$8,473,981,066
*Replacement cost does not include the drying beds and lagoons at LASMA			

Applicable Regulations and Plans

The following existing codes, ordinances, policies or plans are applicable to this hazard mitigation plan:

- The District's Sewer Permit Ordinance was adopted by the Board in July 1969, and was replaced by the Watershed Management Ordinance effective May 1, 2014. Refer to paragraph below for more information on the District's WMO.
- The District's Sewage and Waste Control Ordinance was adopted by the Board on September 19, 1969 and amendment continues to be amended as necessary, is to provide for the abatement and prevention of pollution by regulating and controlling the quantity and quality of sewage, industrial waste and other wastes admitted to or discharged into the sewerage system and waters under the jurisdiction of the District. Through the administration of the Sewage and Waste Control Ordinance, the District is committed to preventing pollution of the area waterway by operating an effective industrial waste pretreatment and source control program in full compliance with all federal and state statutes.

The District provides first response services for hazardous materials emergencies and complaints of pollution in Cook County in response to requests from federal, state and local agencies, municipalities, private citizens and industrial users.

- Since the early 1970s, the District has been working with the separate sanitary sewer systems owners within the District's service area to remove excess groundwater infiltration and stormwater inflow from the sanitary sewer systems in order to prevent water pollution, basement sewage backups, and other adverse sewer surcharging that can create health hazards and financial losses.
- The District adopted the Tunnel and Reservoir Plan (TARP) in 1972 as the Chicago area's plan to cost-effectively comply with Federal and State water quality standards in the 375 square mile combined sewer area consisting of Chicago and 51 suburbs. TARP's main goals are to protect Lake Michigan – the region's drinking water supply - from raw sewage pollution; improve water quality of area rivers and streams; and provide an outlet for floodwaters to reduce street and basement sewage backup flooding.

Phase I of TARP, intended primarily for pollution control, is made up of four distinct tunnel systems: Mainstream, Des Plaines, Calumet, and Upper Des Plaines. The separate tunnel systems are shown on Figure 2. After a storm event, pumping stations dewater the tunnel systems as Water Reclamation Plant (WRP) capacity becomes available, making the tunnel and reservoir capacity available for the next storm event. All captured combined sewer overflow pumped to the WRP receives full secondary treatment prior to being discharged to the waterway pursuant to the National Pollutant Discharge Elimination System permits.

Construction of the Phase I tunnel systems commenced in 1975. By 2006, all of Phase I was completed and in operation. The total system consists of 109.4 miles of deep, large diameter, rock tunnels providing 2.3 billion gallons (BG) of volume to capture combined-sewer overflows that previously discharged at hundreds of outfall locations.

Phase II of TARP consists of reservoirs intended primarily for flood control, but it will also considerably enhance pollution control benefits being provided under Phase I. The U.S. Army Corps of Engineers' Chicagoland Underflow Plan (CUP), Final Phase I General Design Memorandum of 1986 defined the Federal interest in TARP Phase II based on the Federal National Economic Development Plan criteria. The three reservoirs proposed under TARP Phase II/CUP are: the Gloria Alitto Majewski, McCook, and Thornton Reservoirs. The three reservoirs are shown on Figure 2. When all three reservoirs are completed, they will increase the TARP system storage volume to 20.55 BG. The 350 million gallon Majewski Reservoir was completed by the Corps of Engineers in 1998. The McCook Reservoir is currently under construction, and when completed will have a capacity of 10 BG. The McCook Reservoir is being completed in two phases. Phase I was to be completed in 2017 and provide 3.5 BG storage. Phase II is planned to be completed by 2029 and provide an additional 6.5 billion gallons of storage. Thornton Reservoir was also constructed in two stages. The first stage, a temporary 3.1 BG Natural Resources Conservation Service reservoir called Thornton Transitional Reservoir was completed in March 2003 in the West Lobe of the Thornton Quarry. The first stage will return to an active quarry in 2020. The second stage is a permanent 7.9 BG combined Natural Resources Conservation Service /CUP reservoir, located in the North Lobe of the Thornton Quarry. The Thornton Composite Reservoir was completed in 2015.

- The authority for general supervision of stormwater management in Cook County was conveyed to the District pursuant to the passage of Public Act 93-1049 (Act) by the Illinois State Legislature on November 17, 2004.
- In 2005, the District worked with communities to create Watershed Planning Councils. These planning councils represent communities located within major watersheds in Cook County, and communicate the needs and interests of the members of the public and local governments to the District. Currently there are six Watershed Planning Councils: Lower Des Plaines River, Poplar Creek, Upper Salt Creek, Little Calumet River, Calumet-Sag Channel, and the North Branch of the Chicago River.
- The Small Streams Maintenance Program, conceived and established in 2006, follows the MWRD's stormwater management mission to relieve flooding in urbanized areas through immediate and relatively simple remedies. The objective of the program is to remove obstructions and debris in the waterways that impede the natural drainage of Cook County's small streams and rivers.
- On February 15, 2007, the District's Board of Commissioners adopted the Cook County Stormwater Management Plan. The Stormwater Management Plan is a high level organizational plan wherein the overall framework for the countywide program is established. The District was required per the Act to draft and adopt the Cook County Stormwater Management Plan as a first step in establishing the District's countywide stormwater management program. Nineteen stormwater management goals are included in the Stormwater Management Plan. The goals extend from protecting new and existing development from flooding to preventing the loss of water quality and habitat. The CCSMP was amended on July, 2014, to be consistent with P.A. 98-0652, which amended the District's statutory authority to allow for acquisition of flood-prone properties and to plan, implement, finance, and operate local stormwater management projects.

- In 2011, the District finalized Detailed Watershed Plans for all six watersheds in Cook County; the six watersheds are: Calumet-Sag Channel, Upper Salt Creek, Little Calumet River, Poplar Creek, North Branch of the Chicago River and Lower Des Plaines River. The Detailed Watershed Plans provide a summary of each watershed’s stormwater-related areas of concern and a listing of potential regional capital improvement projects to address those concerns. The watershed planning process consisted of several steps, including:
 - Gathering, analyzing, and assessing existing data and information.
 - Identifying stormwater management concerns through outreach to municipalities.
 - Classifying identified concerns as regional (to be addressed under the Detailed Watershed Plans and typically consists of overbank flooding along regional waterways and eroding stream banks that place structures, infrastructure, and/or public safety at risk) or local (i.e. inadequate local storm sewer systems).
 - Developing hydrologic and hydraulic models.
 - Identifying potential projects to address regional stormwater management concerns.
 - Quantifying benefits and costs of potential projects and determining other factors to allow for evaluation of projects by the District’s Board of Commissioners.
- Capital improvement projects emanating from the Detailed Watershed Plans are separated into two categories: stream bank stabilization and flood control. Projects given the highest priority for implementation are stream bank stabilization projects which address stream bank erosion posing an imminent threat to public safety and/or structures. Flood control projects address regional flooding issues through traditional measures, such as stormwater detention reservoirs, levees, and conveyance improvements. Preliminary engineering design, final design, and construction of projects approved by the District’s Board of Commissioners are underway and will continue into the future.
- The Watershed Management Ordinance (WMO) applies to all development within the boundaries of Cook County, Illinois, and qualified sewer construction within the District's corporate boundaries or service agreement areas. Components which are regulated under the WMO include qualified sewer construction, drainage and detention, volume control, floodplain management, isolated wetland protection, riparian environment protection, and soil erosion and sediment control. The WMO went into effect on May 1, 2014 and the District's Board of Commissioners mostly recently amended the WMO on May 16, 2019.
- The Chicago Area Waterways System is managed for the following purposes:
 - Navigation – the waterways are US Navigable waterways and waterway elevations are maintained to be in compliance with the Code of Federal Regulations
 - Stormwater conveyance – the waterways are drawn down in advance of storms to add storage capacity in the waterways and to induce flow downstream, away from Lake Michigan, the source of the region’s drinking water

- Water Quality – the waterways are controlled to promote water quality by increasing the dissolved oxygen in the waterways
- Regional Detention Reservoir Operations – The District operates regional stormwater detention reservoirs throughout Cook County in order to reduce flooding impacts along rivers and streams.
- Maintenance and Operation Plans for Reservoirs – In order to ensure consistent operations of these reservoirs during wet weather events, the District developed strict operations and maintenance procedures.
- TARP Operations Plan – The District operates the TARP system during wet weather in order to minimize combined sewer overflows and flooding.
- Pump Station Operations – During extreme wet weather conditions, the District pumps directly to waterways at select pump stations within its collection system to minimize back- ups and flooding.
- WRP Wet Weather Operations – The District maximizes treatment at its WRPs during wet weather conditions to minimize collection system back-ups, combined sewer overflows, and flooding.
- Emergency action plans define responsibilities and provide procedures designed to identify unusual and unlikely conditions which may endanger dams in time to take mitigating action and to notify the appropriate emergency management officials of possible, impending, or actual failure of a dam. The District has updated emergency action plans for Plum Grove Dam, St. Michael Dam, Twin Lakes Dam, and Buffalo Grove Dam. The District is in the process of updating the emergency action plans for the Touhy Dam. The District also has developed an emergency action plan for the Thornton Gap Dam.
- The District works with various stakeholders before, during, and after design and construction of various water quality and flood control structures, stream-bank stabilization, green infrastructure, flood-prone acquisitions, TARP, and water reclamation projects. The District works with the following stakeholders to get input, funding, approvals, and/or permits: U.S. Army Corps of Engineers, Natural Resources Conservation Service, United States Fish and Wildlife Service, Illinois Environmental Protection Agency (IEPA), Illinois Department of Natural Resources- Office of Water Resources, Illinois Historic Preservation Agency, Illinois Department of Transportation (IDOT), North Cook County Soil and Water Conservation District, Will- South Cook County Soil and Water Conservation District, Forest Preserve District of Cook County, Cook County Department of Transportation and Highways, townships, municipalities, Watershed Planning Councils, and the general public.

Jurisdiction-Specific Natural Hazard Event

The *Natural Hazard Events Table* lists all past occurrences of major natural hazards within the jurisdiction.

TABLE: NATURAL HAZARD EVENTS			
Type of Event	FEMA Disaster # (if applicable)	Date	Preliminary Damage Assessment to MWRD- Owned Infrastructure
Severe Storms, Straight-Line Winds and Flooding	DR-4116, Incident period: 4/16/13 - 5/5/13	4/26/2013	\$1,655,432
Severe Winter Storm and Snowstorm	DR-1960, Incident period: 1/31/11 - 2/3/11	1/31/2011	\$101,384
Severe Storms and Flooding	DR-1935, Incident period: 7/19/10 - 8/7/10	7/19/2010	\$1,417,486
Severe Storm and Flooding	-	2/26/2009	\$1,475,876
Severe Storms and Flooding	DR-1800, Incident period: 9/13/08 - 10/5/08	9/13/2008	\$4,544,335
Severe Storms and Flooding	DR-1729, Incident period: 8/20/07 - 8/31/07	8/20/2007	\$2,519,450
Illinois Hurricane Katrina Evacuation	EM-3230, Incident period: 8/29/05 - 10/1/05	9/7/2005	Not available at this time.*
Illinois Severe Winter Storm	EM-3161, Incident period: 12/11/00 - 12/31/00	12/11/2000	Not available at this time.*
Illinois Winter Snow Storm	EM-3134, Incident period: 1/1/99 - 1/15/99	1/1/1999	Not available at this time.*
Flooding	DR-1188, Incident period: 8/16/97 - 8/17/97	8/16/1997	Not available at this time.*
Flooding	DR-1129, Incident period: 7/17/96 - 8/7/96	7/17/1996	Not available at this time.*
Severe Storms and Flooding	DR-997, Incident period: 4/13/93 - 10/22/93	4/13/1993	Not available at this time.*

Severe Storms and Flooding	DR-798, Incident period: 8/13/87 - 8/30/87	8/13/1987	Not available at this time.*
Severe Storms and Flooding	DR-776, Incident period: 9/21/86 - 10/15/86	9/21/1986	Not available at this time.*
Severe Storms, Flooding, and Tornadoes	DR-643, Incident period: 6/30/81	6/30/1981	Not available at this time.*
Illinois Blizzards and Snowstorms	EM-3068, Incident period: 1/16/1979	1/16/1979	Not available at this time.*
Severe Storms, Flooding, and Tornadoes	DR-509, Incident period: 6/18/76	6/18/1976	Not available at this time.*
Severe Storms and Flooding	DR-373, Incident period: 4/26/73	4/26/1973	Not available at this time.*
Severe Storms and Flooding	DR-351, Incident period: 9/4/72	9/4/1972	Not available at this time.*
Tornadoes	DR-227, Incident period: 4/25/67	4/25/1967	Not available at this time.*
Source: FEMA Disaster History. http://www.fema.gov/news/disasters_state.fema?id=53 *MWRD needs to do further research to determine if damages/cost were incurred.			

Hazard Risk Ranking

The *Hazard Risk Ranking Table* presents the ranking of the hazards of concern.

TABLE: HAZARD RISK RANKING		
Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1	Flooding	42
2	Severe Weather (Extreme Heat, Lightning, Hail, Fog, Wind)	36
3	Dam and Levee Failures	36
4	Earthquakes	30
5	Severe Winter Weather	24
6	Tornado	12
7	Drought	0

Mitigation Strategies and Actions

The heart of the mitigation plan is the mitigation strategy, which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy describes how the community will accomplish the overall purpose, or mission, of the planning process. In this section, mitigation actions/projects were updated/amended, identified, evaluated, and prioritized. This section is organized as follows:

- New Mitigation Actions - New actions identified during this 2019 update process
- Ongoing Mitigation Actions - Ongoing actions with no definitive end or that are still in progress. During the 2019 update, these "ongoing" mitigation actions and projects were modified and/or amended, as needed.
- Completed Mitigation Actions - An archive of all identified and completed projects, including completed actions since 2014.

The *Hazard Mitigation Action Plan Matrix Table* below lists the actions that make up the jurisdiction's hazard mitigation plan. The *Mitigation Strategy Priority Schedule Table* identifies the priority for each action.

TABLE: HAZARD MITIGATION ACTION PLAN MATRIX						
Status	Hazards Mitigated	Objectives Met	Lead Agencies	Estimated Cost	Sources of Funding	Timeline/Projected Completion Date (a)
Action MWRD-1 —Reduce flooding and improve Chicagoland's water quality by completing the Tunnel and Reservoir Plan. The completion of Thornton Reservoir will provide 4.8 billion gallons of storage for combined sewers, and an additional 3.1 Billion Gallons for flood relief from the Thornton River. When complete, the Thornton Reservoir will provide 7.9 billion gallons of storage. The Thornton Reservoir is planned to be completed in 2015.						
Completed	Flooding	2, 9, 12	MWRD	High	MWRD, Grant funding	Completed
Action MWRD-2 —Reduce flooding and improve Chicagoland's water quality by completing the Tunnel and Reservoir Plan. The completion of Phase I of McCook Reservoir will provide 3.5 billion gallons of storage for combined sewers. Phase I of the McCook Reservoir is planned to be completed in 2017.						
Completed	Flooding	2, 9, 12	MWRD	High	MWRD, Corps of Engineers	Completed
Action MWRD-3 —Reduce flooding and improve Chicagoland's water quality by completing the Tunnel and Reservoir Plan. The completion of Phase II of McCook Reservoir will provide an additional 6.5 billion gallons of storage for combined sewers. When complete, the McCook reservoir will provide a total of 10.0 billion gallons. Phase II of the McCook Reservoir is planned to be completed in 2029.						

Ongoing	Flooding	2, 9, 12	MWRD, Corps of Engineers	High	MWRD, Corps of Engineers	Long-term
Action MWRD-4 —Implementation and enforcement of the Watershed Management Ordinance for Cook County.						
Ongoing	Flooding	2, 3, 4, 6, 8, 10, 12, 13	MWRD	Low	MWRD	Short-term and Long-term
Action MWRD-5 —Reduce flooding by designing and implementing flood control projects approved and budgeted by the District’s Board of Commissioners.						
Ongoing	Flooding	2, 3, 9, 12	MWRD	High	MWRD, HMGP, & PDM	Short-term and Long-term
Action MWRD-6 —Reduce potential to damages to structures and infrastructure by designing and implementing stream-bank stabilization projects approved and budgeted by the District’s Board of Commissioners.						
Ongoing	Flooding, Severe Weather	2, 13	MWRD	High	MWRD	Short Term and Long Term
Action MWRD-7 —Reduce flooding, basement backups, and combined sewer overflows by developing guidelines and framework for the District’s Green Infrastructure Program. The guidelines will help with designing, implementing, and promoting green infrastructure.						
Ongoing	Flooding, Severe Weather	2, 3, 9, 12, 13	MWRD	Low	MWRD	Short-term and Long-term
Action MWRD-8 —Continue to work with the Watershed Planning Councils						
Ongoing	Flooding	3, 4, 5, 6, 8, 10, 11, 13	MWRD	Low	MWRD	Short-term and Long-term
Action MWRD-9 —Continue the Small Streams Maintenance Program to reduce potential for flooding in urbanized areas.						
Ongoing	Flooding, Severe Weather	2, 12, 13	MWRD	Low	MWRD	Short-term and Long-term
Action MWRD-10 —Expand Small Streams Maintenance Program’s website content to provide educational materials, as well as general information regarding the management of the Chicago Area Waterways System before, during, and after a storm event.						
Ongoing	Flooding, Severe Storm	6	MWRD	Low	MWRD	Short-term

Action MWRD-11 —Reduce flooding by continuing to seek and support funding partnership opportunities for projects to address flooding.						
Ongoing	Flooding	2, 8, 9, 12, 13	MWRD	High	MWRD, Municipalities Townships, local, state, and federal agencies, etc.	Short-term and Long-term
Action MWRD-12 —Continue to update and improve the District’s existing critical infrastructure and facilities to mitigate against natural hazards through the capital improvement program.						
Ongoing	All	2, 3, 4, 9, 13	MWRD	Low	MWRD, HMGP, & PDM	Short-term and Long-term
Action MWRD-13 —Integrate goals and objectives of the Cook County Natural Hazard Mitigation Plan into existing and future MWRD project and planning actions.						
Ongoing	All	All	MWRD	Low	MWRD	Short-term and Long-term
Action MWRD-14 —Continue to initiate preliminary design, final design, or construction of Stormwater Phase II projects.						
Ongoing	Flooding	1, 2, 8, 9, 12, 13	MWRD	High	MWRD, Municipalities Townships, Cook County, IDOT, HMGP, & PDM	Short-term and Long-term
Action MWRD-15 —Continue the ongoing process of updating existing plans and procedures to mitigate against all hazards, and continue to develop new plans and procedures to mitigate new hazards.						
Ongoing	All	1, 2, 4, 5, 8, 12, 13	MWRD	Low	MWRD, HMGP, & PDM	Short-term and Long-term
Action MWRD-16 —Continue to support the countywide initiatives identified in this plan.						
Ongoing	All Hazards	5, 6, 8, 12	MWRD, Cook Co. DHSEM	Low	MWRD, Cook Co. DHSEM	Ongoing
Action MWRD-17 —Actively participate in the plan maintenance strategy identified in this plan.						
Ongoing	All Hazards	1, 6, 8	MWRD	Low	MWRD	Ongoing

Action MWRD-18—Reduce flooding and improve Chicagoland’s water quality by continuing to use the 4.5 billion gallons Thornton Transitional Reservoir for additional storage of floodwater from Thorn Creek through 2020.

Ongoing	Flood	1, 9	MWRD	Low	MWRD & NRCS	2020
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Action MWRD-19—Address repetitive losses to properties in high flood risk areas throughout the District’s jurisdictional boundaries through our voluntary flood prone property acquisition program.

New	Flood	1, 2, 3, 4, 7, 12	MWRD	Medium	MWRD, Municipalities, Townships, Cook County, FEMA's HMPG, and FEMA's PDM	Ongoing
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Action MWRD-20—Reduce flooding by developing stormwater master plans for subwatersheds, sewer-sheds, or municipalities.

New	Flood	1, 2, 3, 4, 8, 9, 10, 12	MWRD	Low	MWRD	Long-term
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Action MWRD-21—Reduce flooding by distributing low-cost rain barrels to residents of Cook County.

New	Flood	12, 13	MWRD	Low	MWRD	Ongoing
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Action MWRD-22—Reduce flooding by distributing free tree saplings to residents of Cook County.

New	Flood	12, 13	MWRD	Low	MWRD	Ongoing
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(a) Ongoing indicates continuation of an action that is already in place. Short-term indicates implementation within five years. Long-term indicates implementation after five years.

TABLE: MITIGATION STRATEGY PRIORITY SCHEDULE

Action Number	Number of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant-Eligible?	Can Project Be Funded Under Existing Programs/Budgets?	Priority (a)	
1	3	Medium	Low	Yes	Yes	Yes	Medium	
2	3	Medium	Low	Yes	Yes	Yes	Medium	
3	3	Medium	Low	Yes	Yes	Yes	Medium	
4	8	Medium	Low	Yes	Yes	Yes	Medium	

5	4	Medium	Low	Yes	Yes	Yes	Medium	
6	2	Medium	Low	Yes	Yes	Yes	Medium	
7	5	Medium	Low	Yes	Yes	Yes	Medium	
8	8	Medium	Low	Yes	Yes	Yes	Medium	
9	3	Medium	Low	Yes	Yes	Yes	Medium	
10	1	Medium	Low	Yes	Yes	Yes	Medium	
11	5	High	High	Yes	Yes	Yes	Medium	
12	5	Medium	Low	Yes	Yes	Yes	Medium	
13	13	Medium	Low	Yes	No	Yes	Medium	
14	6	High	High	Yes	Yes	Yes	High	
15	7	Medium	Low	Yes	Yes	Yes	Medium	
16	4	High	Low	Yes	Yes	Yes	High	
17	3	Medium	Low	Yes	No	Yes	Medium	
18	2	Medium	Low	Yes	Yes	Yes	Medium	
19	6	High	Medium	Yes	Yes	Yes	High	
20	8	Medium	Low	Yes	Yes	Yes	High	
21	2	Medium	Low	Yes	Yes	Yes	Low	
22	2	Medium	Low	Yes	Yes	Yes	Low	

(a) See Chapter 1 for explanation of priorities.

New Mitigation Actions

The following are new mitigation actions created during the 2019 update.

Action #19

Mitigation Action	Address repetitive losses to properties in high flood risk areas throughout the District's jurisdictional boundaries through our voluntary flood prone property acquisition program.
Year Initiated	2019
Applicable Jurisdiction	MWRD
Lead Agency/Organization	MWRD
Supporting Agencies/Organizations	Municipalities, Townships, and Cook County
Applicable Goal	• Develop and implement sustainable, cost-effective, and environmentally sound risk-reduction (mitigation) projects. • Protect the lives, health, safety, and property of the citizens of Cook County from the impacts of natural hazards.
Applicable Objective	• Eliminate or minimize disruption of local government operations caused by natural hazards through all phases of emergency management. • Increase the resilience of (or protect and maintain) infrastructure and critical facilities. • Consider the impacts of natural hazards on future land uses in the planning area, including possible impacts from climate change. • Integrate hazard mitigation policies into land use plans in the planning area. • Retrofit, purchase, or relocate structures in high hazard areas, including those known to be repetitively damaged.
Potential Funding Source	MWRD, Municipalities, Townships, Cook County, FEMA's HMPG, and FEMA's PDM
Estimated Cost	Varies year to year
Benefits (loss avoided)	The program will help remove flood prone properties from the floodplain.
Projected Completion Date	Ongoing
Priority and Level of Importance (Low, Medium, High)	High Priority
Benefit Analysis (Low, Medium, High)	High—Project will provide an immediate reduction of risk exposure for life and property.
Cost Analysis (Low, Medium, High)	Medium—The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget

	amendment, or the cost of the project would have to be spread over multiple years.
Actual Completion Date	

Recommended Mitigation Action/Implementation Plan and Project Description	
Action/Implementation Plan and Project Description:	

Mitigation Action and Project Maintenance		
Year	Status	Comments
2019	New	
2020		
2021		
2022		
2023		

Mitigated Hazards	
	All Hazards
	Dam/Levee Failure
	Drought
	Earthquake
X	Flood
	Extreme Heat
	Lightning
	Hail
	Fog
	High Wind
	Snow
	Blizzard
	Extreme Cold
	Ice Storms
	Tornado
	Epidemic or pandemic
	Nuclear Power Plant Incident
	Widespread Power Outage
	Coastal Erosion
	Secondary Impacts from Mass Influx of Evacuees
	Hazardous Materials Incident

Action #20

Mitigation Action	Reduce flooding by developing stormwater master plans for subwatersheds, sewer-sheds, or municipalities.
Year Initiated	2019
Applicable Jurisdiction	MWRD
Lead Agency/Organization	MWRD
Supporting Agencies/Organizations	Municipalities, Townships, and Cook County
Applicable Goal	• Develop and implement sustainable, cost-effective, and environmentally sound risk-reduction (mitigation) projects. • Protect the lives, health, safety, and property of the citizens of Cook County from the impacts of natural hazards. • Protect public services and critical facilities, including infrastructure, from loss of use during natural hazard events. • Involve stakeholders to enhance the local capacity to mitigate, prepare for, and respond to the impacts of natural hazards. • Develop, promote, and integrate mitigation action plans. • Promote public understanding of and support for hazard mitigation.
Applicable Objective	• Eliminate or minimize disruption of local government operations caused by natural hazards through all phases of emergency management. • Increase the resilience of (or protect and maintain) infrastructure and critical facilities. • Consider the impacts of natural hazards on future land uses in the planning area, including possible impacts from climate change. • Integrate hazard mitigation policies into land use plans in the planning area. • Establish partnerships among all levels of local government, the private sector, and/or nongovernmental organizations to improve and implement methods to protect people and property.

	• Provide or improve flood protection on a watershed basis with flood control structures and drainage maintenance plans. • Strengthen codes and land use planning and their enforcement, so that new construction or redevelopment can avoid or withstand the impacts of natural hazards. • Reduce natural hazard-related risks and vulnerability to potentially isolated populations within the planning area.
Potential Funding Source	MWRD
Estimated Cost	Estimate of \$3.5 million/year
Benefits (loss avoided)	Identify opportunities to address urban flooding
Projected Completion Date	Long term
Priority and Level of Importance (Low, Medium, High)	High Priority
Benefit Analysis (Low, Medium, High)	Medium—Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
Cost Analysis (Low, Medium, High)	Low—The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.
Actual Completion Date	

Recommended Mitigation Action/Implementation Plan and Project Description	
Action/Implementation Plan and Project Description:	

Mitigation Action and Project Maintenance		
Year	Status	Comments
2019	New	
2020		
2021		
2022		
2023		

Mitigated Hazards	
	All Hazards
	Dam/Levee Failure

	Drought
	Earthquake
X	Flood
	Extreme Heat
	Lightning
	Hail
	Fog
	High Wind
	Snow
	Blizzard
	Extreme Cold
	Ice Storms
	Tornado
	Epidemic or pandemic
	Nuclear Power Plant Incident
	Widespread Power Outage
	Coastal Erosion
	Secondary Impacts from Mass Influx of Evacuees
	Hazardous Materials Incident

Action #21

Mitigation Action	Reduce flooding by distributing low-cost rain barrels to residents of Cook County.
Year Initiated	2019
Applicable Jurisdiction	MWRD
Lead Agency/Organization	MWRD
Supporting Agencies/Organizations	N/A
Applicable Goal	- Protect the lives, health, safety, and property of the citizens of Cook County from the impacts of natural hazards. - Involve stakeholders to enhance the local capacity to mitigate, prepare for, and respond to the impacts of natural hazards. - Promote public understanding of and support for hazard mitigation.
Applicable Objective	- Reduce natural hazard-related risks and vulnerability to potentially isolated populations within the planning area. - Encourage hazard mitigation measures that result in the least adverse effect on the natural environment and that use natural processes.
Potential Funding Source	MWRD
Estimated Cost	Estimate cost of \$50K/year
Benefits (loss avoided)	Help reduce flooding by collecting stormwater runoff in rain barrels
Projected Completion Date	Ongoing
Priority and Level of Importance (Low, Medium, High)	Low Priority
Benefit Analysis (Low, Medium, High)	Medium—Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
Cost Analysis (Low, Medium, High)	Low—The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.
Actual Completion Date	

Recommended Mitigation Action/Implementation Plan and Project Description	
Action/Implementation Plan and Project Description:	

Mitigation Action and Project Maintenance

Year	Status	Comments			
2019	New				
2020					
2021					
2022					
2023					

Mitigated Hazards	
	All Hazards
	Dam/Levee Failure
	Drought
	Earthquake
X	Flood
	Extreme Heat
	Lightning
	Hail
	Fog
	High Wind
	Snow
	Blizzard
	Extreme Cold
	Ice Storms
	Tornado
	Epidemic or pandemic
	Nuclear Power Plant Incident
	Widespread Power Outage
	Coastal Erosion
	Secondary Impacts from Mass Influx of Evacuees
	Hazardous Materials Incident

Action #22

Mitigation Action	Reduce flooding by distributing free tree saplings to residents of Cook County.
Year Initiated	2019
Applicable Jurisdiction	MWRD
Lead Agency/Organization	MWRD
Supporting Agencies/Organizations	
Applicable Goal	- Protect the lives, health, safety, and property of the citizens of Cook County from the impacts of natural hazards. - Involve stakeholders to enhance the local capacity to mitigate, prepare for, and respond to the impacts of natural hazards. - Promote public understanding of and support for hazard mitigation.
Applicable Objective	- Reduce natural hazard-related risks and vulnerability to potentially isolated populations within the planning area. - Encourage hazard mitigation measures that result in the least adverse effect on the natural environment and that use natural processes.
Potential Funding Source	MWRD
Estimated Cost	Low
Benefits (loss avoided)	Helps reduce flooding by allowing trees to absorb rain water
Projected Completion Date	Ongoing
Priority and Level of Importance (Low, Medium, High)	Low Priority
Benefit Analysis (Low, Medium, High)	Medium—Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
Cost Analysis (Low, Medium, High)	Low—The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.
Actual Completion Date	

Recommended Mitigation Action/Implementation Plan and Project Description	
Action/Implementation Plan and Project Description:	

Mitigation Action and Project Maintenance

Year	Status	Comments			
2019	New				
2020					
2021					
2022					
2023					

Mitigated Hazards	
	All Hazards
	Dam/Levee Failure
	Drought
	Earthquake
X	Flood
	Extreme Heat
	Lightning
	Hail
	Fog
	High Wind
	Snow
	Blizzard
	Extreme Cold
	Ice Storms
	Tornado
	Epidemic or pandemic
	Nuclear Power Plant Incident
	Widespread Power Outage
	Coastal Erosion
	Secondary Impacts from Mass Influx of Evacuees
	Hazardous Materials Incident

Ongoing Mitigation Actions

The following are ongoing actions with no definitive end or that are still in progress. During the 2019 update, these "ongoing" mitigation actions and projects were modified and/or amended, as needed.

Action #3 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 3—MWRD	Reduce flooding and improve Chicagoland's water quality by completing the Tunnel and Reservoir Plan. The completion of Stage II of McCook Reservoir will provide an additional 6.5 billion gallons of storage for combined sewers. When complete, the McCook reservoir will provide a total of 10.0 billion gallons. Stage II of the McCook Reservoir is planned to be completed in 2029.	
Status Description: Yes	Construction of Stage II of the McCook Reservoir is still planned to be completed in 2029. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #4 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 4—MWRD	Implementation and enforcement of the Watershed Management Ordinance for Cook County.	
Status Description: Yes	In 2014, 2015, 2016, 2017, and 2018 MWRD respectively issued 149, 345, 384, 416, and 382 WMO permits. As a result of WMO enforcement, approximately 54 million gallons (MG) of green infrastructure volume, 520 MG of stormwater detention volume, and 13.8 MG of compensatory storage volume have been provided. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #5 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 5—MWRD	Reduce flooding by designing and implementing flood control projects approved and budgeted by the District's Board of Commissioners.	
Status Description: Yes	MWRD has completed 7 Phase I Flood Control Projects since September 2014. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #6 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 6—MWRD	Reduce potential to damages to structures and infrastructure by designing and implementing stream-bank stabilization projects approved and budgeted by the District's Board of Commissioners	
Status Description: Yes	MWRD has completed 10 Phase I Streambank Stabilization Projects since September 2014. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #7 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 7—MWRD	Reduce flooding, basement backups, and combined sewer overflows through the District's Green Infrastructure Program. The guidelines will help with designing, implementing, and promoting green infrastructure.	
Status Description: Yes	MWRD has completed 26 Green Infrastructure Projects since September 2014. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #8 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 8—MWRD	Continue to work with the Watershed Planning Councils	
Status Description: Yes	MWRD meet quarterly with the Water Planning Councils (WPC) to provide updates on our Capital Improvement Projects, Small Stream Maintenance Program, Rain Barrel Program, Restore the Canopy Program, Watershed Management Ordinance, Infiltration / Inflow Control Program . This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #9 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 9—MWRD	Continue the Small Streams Maintenance Program to reduce potential for flooding in urbanized areas.	
Status Description: Yes	In 2014, 2015, 2016, 2017, and 2018, SSMP respectively removed 21,895 cubic yards (CY), 23,678 CY, 26,016 CY, 21,043 CY, and 26,299 CY of debris from the streams, creeks, and rivers. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #10 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 10—MWRD	Expand Small Streams Maintenance Program's website content to provide educational materials, as well as general information regarding the management of the Chicago Area Waterways System before, during, and after a storm event.	
Status Description: Yes	MWRD developed a webpage (http://gispub.mwrdd.org/incidentreporting/) and an iPhone app called MWRD CIR to allow residents to quickly report blockages on the streams, creeks, and rivers to SSMP. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #11 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 11—MWRD	Reduce flooding by continuing to seek and support funding partnership opportunities for projects to address flooding.	
Status Description: Yes	MWRD continues to seek and support partnerships for projects to address flooding with municipalities, county, governmental agencies, and non-governmental organizations. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #12 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 12—MWRD	Continue to update and improve the District's existing critical infrastructure and facilities to mitigate against natural hazards through the capital improvement program.	
Status Description: Yes	MWRD is regularly updating existing critical infrastructure and facilities to mitigate against natural hazards through our capital improvement program. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #13 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 13—MWRD	Integrate goals and objectives of the Cook County Natural Hazard Mitigation Plan into existing and future MWRD project and planning actions.	
Status Description: Yes	This action item is ongoing, and the time frame is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #14 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 14—MWRD	Continue to initiate preliminary design, final design, or construction of Stormwater Phase II projects.	
Status Description: Yes	MWRD has completed 18 Phase II since September 2014. We also accepted 20 additional Phase II Projects into MWRD's Phase II Program in 2018. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #15 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 15—MWRD	Continue the ongoing process of updating existing plans and procedures to mitigate against all hazards, and continue to develop new plans and procedures to mitigate new hazards.	
Status Description: Yes	MWRD continues to update existing plans and procedures to mitigate against all hazards, and continue to develop new plans and procedures to mitigate new hazards. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #16- MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 16—MWRD	Continue to support the countywide initiatives identified in this plan.	
Status Description: Yes	MWRD continues to supports the countywide initiatives identified in this Cook County HMP. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #17 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 17—MWRD	Actively participate in the plan maintenance strategy identified in this plan.	
Status Description: Yes	MWRD continues to actively participate with the plan maintenance for the Cook County HMP. This action item is ongoing, and the timeline is still appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #18 - MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 18—MWRD	Reduce flooding and improve Chicagoland's water quality by continuing to use the 4.5 billion gallons Thornton Transitional Reservoir for additional storage of floodwater from Thorn Creek through 2020.	
Status Description: Yes	In April 2015, MWRD was granted an extension to its easement with Hanson Material Service Corporation to continue to use the 4.5 billion gallon Thornton Transitional Reservoir for storage of floodwater from Thorn Creek through 2020. This new action item is ongoing, and the timeline is appropriate.	O
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Completed Mitigation Actions

The following section represents completed mitigation actions, and serves as an archive of identified and completed projects.

Action #1 – MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 1—MWRD	Reduce flooding and improve Chicagoland's water quality by completing the Tunnel and Reservoir Plan. The completion of Thornton Reservoir will provided 4.8 billion gallons of storage for combined sewers, and an additional 3.1 Billion Gallons for flood relief from the Thornton River. When complete, the Thornton Reservoir will provide 7.9 billion gallons of storage. The Thornton Reservoir is planned to be completed in 2015.	
Status Description: Yes	Thornton Reservoir was completed and placed in service in 2015. This action item can be removed from MWRD's action plan during the next update of the HMP.	C
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

Action #2 – MWRD

TABLE: ACTION PLAN MATRIX		
Action Number Action Taken Y/N	Action Item Description	Status (X, O, C, R, N)
# 2—MWRD	Reduce flooding and improve Chicagoland's water quality by completing the Tunnel and Reservoir Plan. The completion of Phase I of McCook Reservoir will provide 3.5 billion gallons of storage for combined sewers. Stage I of the McCook Reservoir is planned to be completed in 2017.	
Status Description: Yes	Stage I of the McCook Reservoir was placed in service in 2017. This action item can be removed from MWRD's action plan during the next update of the HMP.	C
Completion status legend: N = New O = Action Ongoing toward Completion C = Project Completed R = Want Removed from Annex X = No Action Taken		

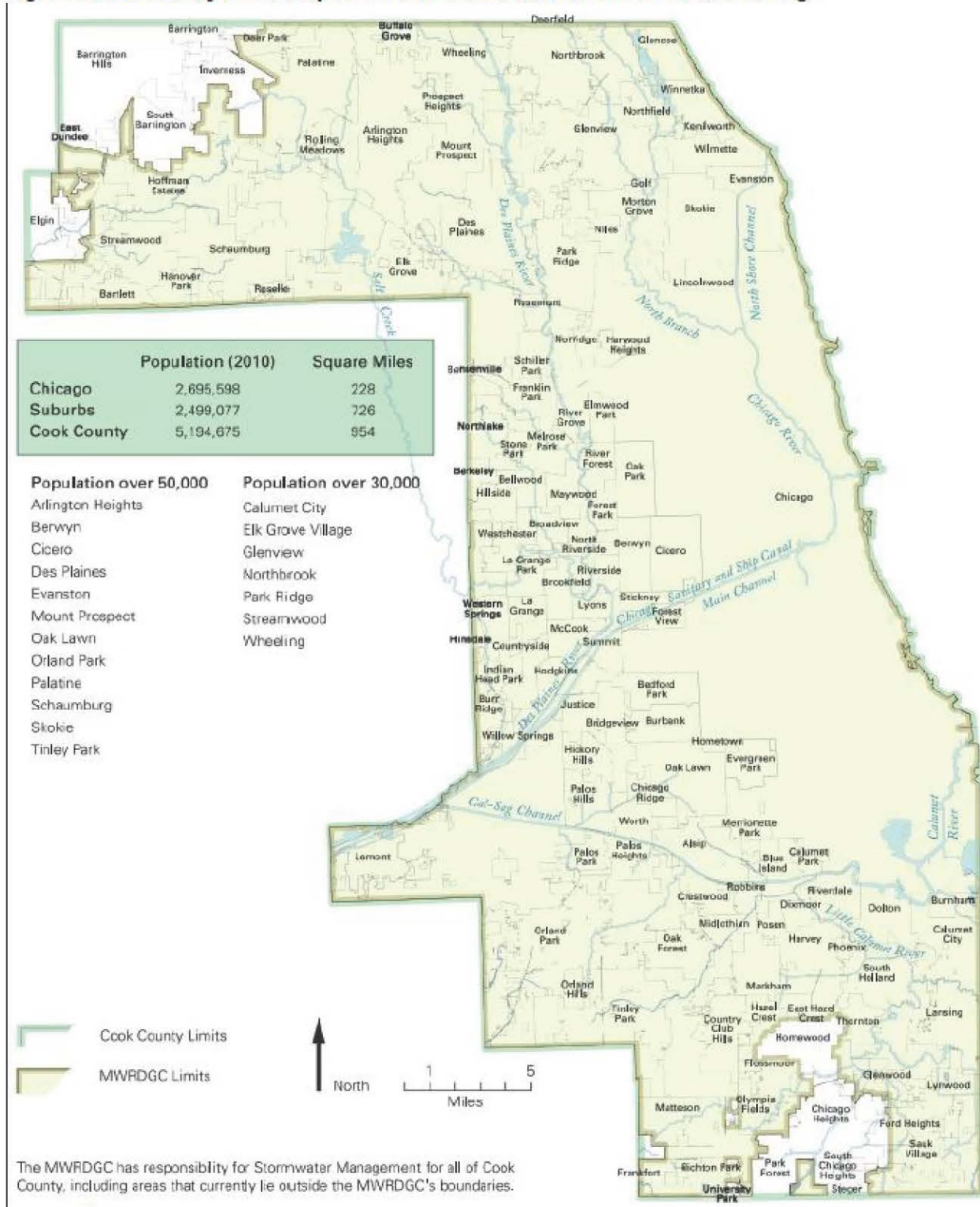
Future Needs to Better Understand Risk/Vulnerability

Understanding risk and vulnerability is an ongoing effort by District. Such efforts are ongoing as partnerships are developed, and should be maintained in order to keep informed on potential risk to the District.

Additional Comments

No additional comments at this time

Hazard Mapping

Figure 1: Cook County and Metropolitan Water Reclamation District of Greater Chicago

January 2019

Figure 2: Tunnel and Reservoir Plan Project Status

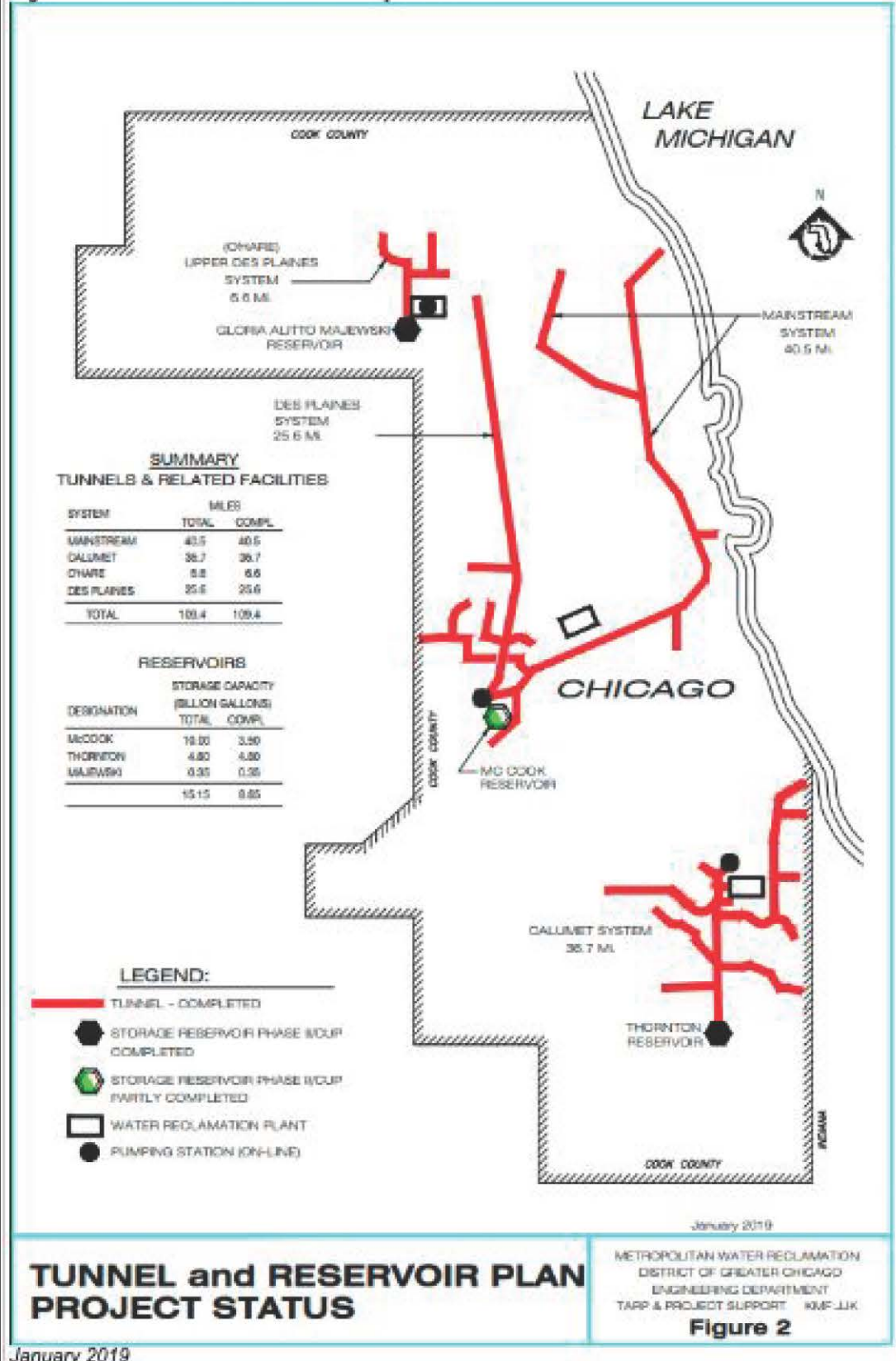
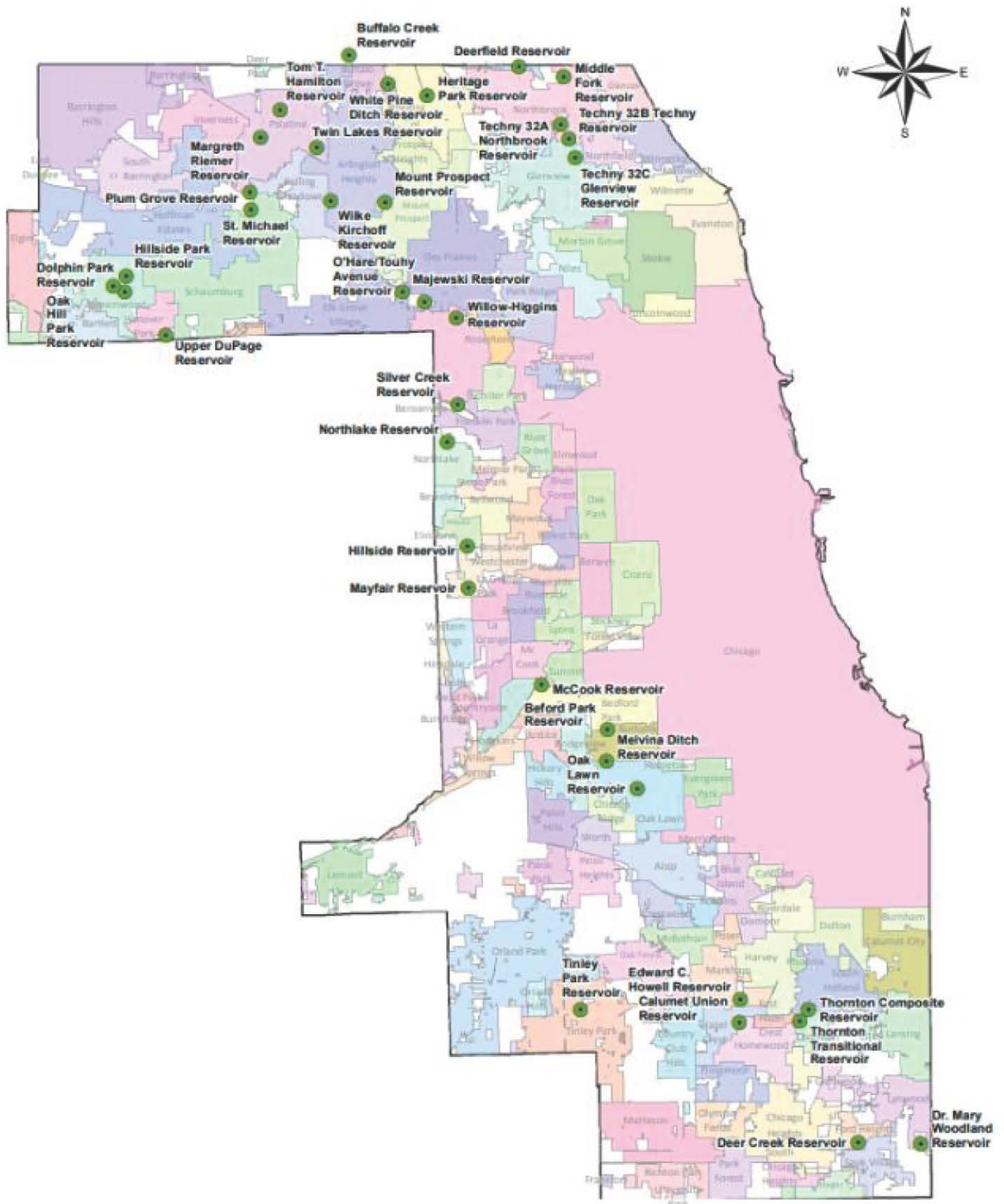


Figure 3: Cook County and Metropolitan Water Reclamation District of Greater Chicago

January 2019