CITY OF CHICAGO

DEPARTMENT OF WATER MANAGEMENT

January 7, 2021

Illinois Department of Natural Resources
Office of Water Resources
160 N. LaSalle Street, Suite S-703
Chicago, Illinois 60601-3117

James F. Kessen, P.E.
Lake Michigan Management Section

Mr. Kessen:

Enclosed are the completed annual water usage Report LMO-2 and the AWWA Water Loss Audit's Reporting Worksheet, Performance Indicators Sheet and the User Comments Sheet for the 2020 water accounting year from October 1, 2019 through September 30, 2020.

A supplemental sheet, attached to the report, details the average daily supply of water transferred to other entities.

A report detailing the activities of the Chicago Water System in regard to water conservation and accountability during the 2020 water accounting year is also attached. If you should have any questions regarding this report, please contact Kwok Ho at 312-742-3609.

Very truly yours,

Andrea R.H. Cheng, P.E., Ph.D.,
Acting Commissioner

Illinois Department of
Natural Resources
One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

JB Pritzker, Governor
Colleen Callahan, Director

Office of Water Resources, Michael A. Bilandic Building, 160 N. LaSalle St., S-703, Chicago, IL 60601

2020 Annual Water Use Audit Form (LMO-2)

This form must be completed by all Category IA and IB Permittees for the annual water use accounting year running from October 1, 2019 through September 30, 2020. This form must be completed and submitted to the Department by January 8, 2021.

Section I - General Information

Permittee Contact Information:

Permittee: The City of Chicago Department of Water Management
Address: 1000 East Ohio Street
Chicago, Illinois 60611

County: Cook
Phone: 312-744-7001
Email:

Contact Person Information:

Name: Andrea R.H. Cheng, P.E., Ph.D.
Address: 1000 East Ohio Street

Phone: 312-744-7001
Email: Andrea.Cheng@cityofchicago.org

Authorized Official Andrea R.H. Cheng, P.E., Ph.D.

Title: Acting Commissioner
Date: 1/7/2021

Service Population: 2,695,598

"Service Population" is the total population the permittee serves with water related to their allocation, both inside and outside their corporate limits. This does not include population associated with water exported/sold to other systems.

The Illinois Department of Natural Resources is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Chapter 19, Section 120.2 of the Illinois Revised Statutes. Disclosure of this information is required. Failure to provide any information will result in this form not being processed. This form has been approved by the Forms Management Center, CMS.

Section II - Water Supplied:

In order to complete this form you will have to first complete the AWWA Free Water Audit Software. Lines 4, 8, 24 and 26 - 38 (highlighted below) must be taken directly from the AWWA Free Water Audit Software's "Reporting Worksheet" and "Performance Indicator" worksheets. A completed version of the AWWA Free Water Audit Software must be submitted along with the completed LMO-2 form (submit both as Microsoft Excel files). All amounts should be rounded to three decimal places.

Volume from own sources:

1. Shallow Well		mg/y	0.000	**mgd**
2. Deep Well		mg/y	0.000	**mgd**
3. Lake Michigan (Direct Diverters only)	236,100.744	mg/y	645.084	**mgd**
4. Total Volume From Own Sources	236,100.744	mg/y	645.084	**mgd**

Water imported from other sources:

	Supplier:			**Amount:**	
5			mg/y	0.000	**mgd**
6			mg/y	0.000	**mgd**
7			mg/y	0.000	**mgd**
8. Total Water Imported		0.000	mg/y	0.000	**mgd**

Water exported to other systems:

	System:			**Amount:**	
9	(See Attachment 1)	92,118.174	mg/y	251.689	**mgd**
10			mg/y	0.000	**mgd**
11			mg/y	0.000	**mgd**
12			mg/y	0.000	**mgd**
13			mg/y	0.000	**mgd**
14			mg/y	0.000	**mgd**
15			mg/y	0.000	**mgd**
16			mg/y	0.000	**mgd**
17			mg/y	0.000	**mgd**
18			mg/y	0.000	**mgd**
19			mg/y	0.000	**mgd**
20			mg/y	0.000	**mgd**
21			mg/y	0.000	**mgd**
22			mg/y	0.000	**mgd**
23			mg/y	0.000	**mgd**

24. Total Water Exported	92,118.174	mg/y	251.689	**mgd**
25. WATER SUPPLIED (Line 4 + Line 8 - Line 24)			393.395	**mgd**
26. WATER SUPPLIED (adjusted for master meter error)	**141,413.719**	mg/y	386.376	**mgd**

Section III; Authorized Consumption:

27. Billed Metered	71,705.622	mg/y	195.917	**mgd**
28. Billed Unmetered	53,374.146	mg/y	145.831	**mgd**
29. Unbilled Metered	3,662.562	mg/y	10.007	**mgd**
30. Unbilled Unmetered	1,757.166	mg/y	4.801	**mgd**
(If not using the AWWA default of 1.25% of Water Supplied, provide an explanation)				
31. AUTHORIZED CONSUMPTION	**130,499.496**		356.556	**mgd**

Section IV: Water Losses:

32. Apparent Losses	**1,294.093**	mg/y	3.536 **mgd**
33. Real Losses	**9,620.130**	mg/y	26.285 **mgd**
34. Water Losses	**10,914.223**	mg/y	29.820 **mgd**

Section V: Non Revenue Water:

35. NON REVENUE WATER	**16,333.951**	mg/y	44.628 **mgd**

Section VI: Performance Indicators:

36. Annual cost of Apparent Losses	5,279,900	**$/year**
37. Annual cost of Real Losses	2,247,359	**$/year**
38. Non-revenue water as percent by volume of Water Supplied	11.6	**%**

Section VII - Conversion Table

Below are conversion calculations to convert the most commonly used units to units of million gallons per day (mgd).

To convert cubic feet per year (cf) to (mgd) use:
(cf x 7.48)/1,000,000/365 = mgd

To convert gallons per year (g) to (mgd) use:
g/1,000,000/365

To convert gallons per day (g/d) to (mgd) use:
(g/d)/1,000,000

To convert million gallons per year (mg) to (mgd) use:
mg/365 = mgd

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Chicago, Department of Water Management
Reporting Year: 2020 10/2019 - 9/2020

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

				Pcnt:	Value:	
Volume from own sources:	9	236,100.744	MG/Yr	1.10%		MG/Yr
Water imported:	5	0.000	MG/Yr			MG/Yr
Water exported:	7	92,118.174	MG/Yr	0.00%		MG/Yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 141,413.719 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	8	71,705.622	MG/Yr			
Billed unmetered:	5	53,374.146	MG/Yr			
Unbilled metered:	9	3,662.562	MG/Yr			
Unbilled unmetered:	6	1,757.166	MG/Yr		1,757.166	MG/Yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 130,499.496 MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption) 10,914.223 MG/Yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		353.534	MG/Yr	0.25%		MG/Yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	5	761.295	MG/Yr	1.00%		MG/Yr
Systematic data handling errors:		179.264	MG/Yr	0.25%		MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 1,294.093 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 9,620.130 MG/Yr

WATER LOSSES: 10,914.223 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 16,333.951 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	4,419.9	miles	
Number of active AND inactive service connections:	9	534,788		
Service connection density:		121	conn./mile main	
Are customer meters typically located at the curbstop or property line?		No		
Average length of customer service line:	6	50.0	ft	(length of service line, beyond the property boundary, that is the responsibility of the utility)
Average operating pressure:	9	45.0	psi	

COST DATA

Total annual cost of operating water system:	9	$791,709,000	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$4.08	$/1000 gallons (US)	
Variable production cost (applied to Real Losses):	7	$233.61	$/Million gallons	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 77 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Billed unmetered
2: Customer metering inaccuracies
3: Water exported

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.

Water Audit Report for: City of Chicago, Department of Water Management

Reporting Year: 2020 | 10/2019 - 9/2020

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 77 out of 100 ***

System Attributes:

	Apparent Losses:	1,294.093	MG/Yr
+	Real Losses:	9,620.130	MG/Yr
=	**Water Losses:**	**10,914.223**	MG/Yr
?	Unavoidable Annual Real Losses (UARL):	2,334.19	MG/Yr
	Annual cost of Apparent Losses:	$5,279,900	
	Annual cost of Real Losses:	$2,247,359	Valued at **Variable Production Cost**

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	11.6%	
	Non-revenue water as percent by cost of operating system:	1.1%	Real Losses valued at Variable Production Cost
Operational Efficiency:	Apparent Losses per service connection per day:	6.63	gallons/connection/day
	Real Losses per service connection per day:	49.28	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	1.10	gallons/connection/day/psi
	From Above, Real Losses = Current Annual Real Losses (CARL):	9,620.13	million gallons/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	4.12	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

AWWA Free Water Audit Software:
User Comments

Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

General Comment:	All data used in this report is based on the water year 10/1/19 through 9/30/20.

Audit Item	Comment
Volume from own sources:	The total Volume is metered pumpage from our twelve pumping stations from 10/1/19 through 9/30/20. A lag time correction has not been applied
Vol. from own sources: Master meter error adjustment:	The total Volume from own sourses is measured by 56 venturi tube flowmeters in twelve pumping stations over the City. The flowmeters were calibrated routinely through the year. The average of accuracy for the 56 venturi tube flowmeters is +1.10% based on flowmeters calibration reports. The meter error adjustment is +1.10% as 2019 September.
Water imported:	NONE
Water imported: master meter error adjustment:	N/A
Water exported:	The total volume of water is metered and billed to the direct connected 50 suburban consumers from 10/1/19 through 9/30/20. Since no data are available, a lag time correction has not been applied.
Water exported: master meter error adjustment:	DuPage Water Commission (DWC) and Northwest Suburban Municipal Joint Action Water Agency (JAWA) calibrate their flowmeters routinely. The rest of 50 suburban customers have no flowmeter calibration reports, therefore the water exported meter error adjustment is 0.00% as 2019 September.
Billed metered:	71,705.622 MG/Yr is the summation of 335,178 metered accounts from 10/1/19 through 9/30/20. All meters are read between the 20th and 30th day of every two months. Most readings are abtained by AMR with some meters may be readed in-person.The billing frequency is also for two months. Even some meter readings were not taken at the beginning and end of the audit year (off few days), but the water usages were accumulated for 366 days. Furthermore, all meter readings were taken continuatively following previous LMO-2 Report year. Lag time correction has not been applied. No billed metered hydrant used.
Billed unmetered:	53,374.146 MG/Yr is the summation of 199,610 accounts from 10/1/19 through 9/30/20. All accounts are categorized in to about 28 Service Classes based on the properties type, size and in-premises inspection. Each Service Class has a flat rate determined from a practical manner.
Unbilled metered:	It is the total volume of water exemption for the schools, universities, churches, hospitals, nonprofit organizations and public facilities. The unbilled value of 3,662.562 MG/Yr is the summation of about 6,309 metered accounts from 10/1/19 through 9/30/20. All meters are read monthly or bimonthly. Since the time at reading taken for individual meter was unavailable, lag time correction has no been applied. No unbilled metered hydrant used.

Audit Item	Comment
Unbilled unmetered:	It is the summation of Fire Hydrant water usages for firefighting, new water main flushing, sewer cleaning, street cleaning, public construction, and water quality request flushing. The water usage from new Water Main Flushing and Water Quality Purposes were calculated based on the data. The water usage from other five categories were estimated based on the traditional method. There were no water meters installed on the open hydrants.
Unauthorized consumption:	Unauthorized consumption is due to unauthorized and illegal open fire hydrants.
Customer metering inaccuracies:	There are 335,178 water meters for customer accounts. All meters comply with AWWA Standards. There are no routine meters calibration program, City will calibrate or replace the faulty meters when the reading appears abnormal or customers requested. Considering the huge number of water meters and the age of the meters, the percentage of 1.00% was used for the customer metering inaccuracy.
Systematic data handling errors:	The default errors percentage 0.25% was used.
Length of mains:	The Length of mains is the total length of transmission and distribution pipelines. It included Fire Hydrants lead. It doesn't include the service connection lines which belong to private.
Number of active AND inactive service connections:	534,788 of Active & inactive service connections is the same number of total accounts. The only difference is that the inactive service connection's accounts have no bills. There was no private fire sprinkler line connected to public water main.
Average length of customer service line:	The average length of customer service line is 50 feet measuring from the City's water main to the customer's building.
Average operating pressure:	The average operating pressure is 45 psi. The pressure is measured at pumping station discharge with pressure transmitter sending the signal to the SCADA system. There are over 90 water pressure monitoring points over the city indicating the real time water pressure readings.
Total annual cost of operating water system:	The total annual cost of operating water system is from the City of Chicago 2019 Financial Statement (Water Fund). It included Source of supply, Power and pumping, Purification, Transmission and distribution, Customer accounting, Administrative, General Fund reimbursements, and Construction of capital assets.
Customer retail unit cost (applied to Apparent Losses):	$4.08 per 1000 gal. is the water rate of 2020 for the city customers and the suburban wholesale accounts.
Variable production cost (applied to Real Losses):	The variable production cost came from City of Chicago 2020 Budget Recommendation for Department of Water Management. It included water pumping, water treatment. It doesn't include personnel services .

Attachment 1

CITY OF CHICAGO
DEPARTMENT OF WATER
SUPPLEMENT TO FORM LMO-2

WATER METERED AND BILLED DIRECTLY BY CHICAGO WATER DEPARTMENT
OCTOBER 1, 2019 TO SEPTEMBER 30, 2020

ENTITY	MGD
ALSIP *	5.374
BEDFORD PARK *	21.058
BERWYN	4.889
BLUE ISLAND	1.920
BRIDGEVIEW	2.033
BROOKFIELD-N. RIVERSIDE W.C. *	3.538
BURNHAM	0.090
CALUMET CITY	0.275
CALUMET PARK	0.688
CENT. STICKNEY SD	0.088
CICERO	6.700
DES PLAINES *	1.623
DOLTON	2.467
DUPAGE W.C. *	74.570
ELMWOOD PARK	2.306
EVERGREEN PARK	1.474
FOREST PARK	1.581
FOREST VIEW	0.145
FRANKLIN PARK	2.380
GARDEN HOMES S.D.	0.081
HARVEY *	8.819
HARWOOD HEIGHTS	0.811
HILLSIDE-BERKELEY W.C. *	1.476
HOMETOWN	0.325
WEST SUBURBAN W.C. * (JUSTICE-WILLOW SPRINGS W.C.)	2.527
LINCOLNWOOD	1.115
MAYWOOD	2.577
McCOOK *	5.651
MELROSE PARK *	8.261
MERRIONETTE PARK	0.170
MIDLOTHIAN-MARKHAM W.C. *	2.656
MORTON GROVE *	0.750
NILES *	0.611
NORRIDGE	1.231
NORTHWEST SUB JOINT ACTION W. A. *	27.166
OAK LAWN *	26.528
OAK PARK	5.425
PARK RIDGE	3.699
RIVER FOREST	1.133
RIVER GROVE	1.011
RIVERDALE	1.934
ROBBINS	1.013
ROSEMONT	1.498
SCHILLER PARK	1.103
SOUTH HOLLAND *	2.044
SOUTH STICKNEY S.D.	2.074
STICKNEY	1.346
SUMMIT	1.111
WESTCHESTER-BROADVIEW W.C. *	3.545
WORTH	0.804
TOTAL	251.689

* INCLUDES OTHER MUNICIPALITIES
ALL METERS ARE READ BETWEEN THE 20TH AND 30TH DAY OF EACH MONTH

Explanation for the Report (LMO-2) Line No. 30.
(not using the AWWA default of 1.25% of Water Supplied.)

Excessive unbilled unmetered water usage was due to the following factors:

	Estimated Usage	Percentage of water supplied
1. NEW WATER MAIN FLUSHING. An accelerated water main replacement program is in progress. More hydrant flow is needed for water main flushing.	0.997 mgd	0.25%
2. FIREFIGHTING & TRAINING	1.967 mgd	0.50%
3. SEWER CLEANING	0.100 mgd	0.03%
4 STREET CLEANING	0.100 mgd	0.03%
5. PUBLIC FACILITIES CONSTRUCTION	0.393 mgd	0.10%
6. WATER MAIN FLUSHING FOR WATER QUALITY PURPOSES	0.827 mgd	0.21%
7. EXEMPTED UNMETERED ACCOUNTS	0.417 mgd	0.11%
TOTAL UNBILLED UNMETERED WATER USAGE	4.801 mgd	1.22%
	1757.166 MG/Yr	

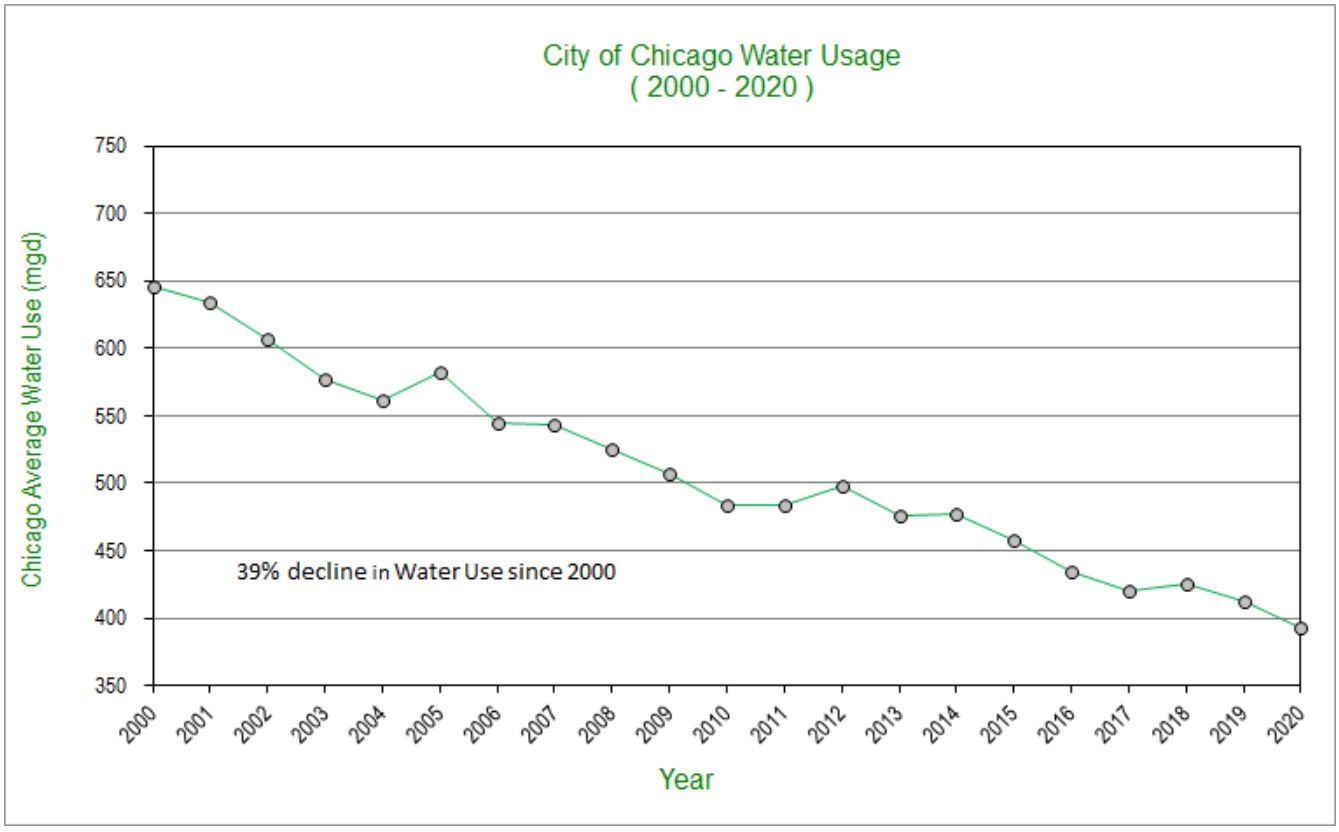
Attachment 3

WATER CONSERVATION PROGRAM

During the 2020 water accounting year, the City of Chicago has continued to promote water conservation through a number of initiatives and policies to better conserve our fresh water and to wisely manage storm water. Our water conservation plan is a partnership among public and private sectors, and each resident of Chicago. It includes investing in infrastructure upgrades, working with our sister agencies and large industrial customers to promote conservation, and developing a plan to meter all residential water users. The Department of Water Management continues to see declining water usage due to its continued efforts to reduce water waste by investing in the following programs:

1.) Water Main Replacement
2.) Hydrant Custodian Installation
3.) Education and Public Awareness
4.) Meter Installation and Maintenance
5.) Elimination of Unused Services
6.) Underground Leak Detection and Repair
7.) SCADA System
8.) Installation of Variable Speed Pumps

The chart below demonstrates our progress with a plan that has had significant results in reducing water usage for the City of Chicago.



WATER MAIN REPLACEMENT

The Water Main Replacement Program was designed to address the City's aging water mains which were installed over 100 years ago at the height of Chicago's exponential growth rate. The selection of water mains to be replaced is based primarily from analyzing break history records to determine where replacement would most benefit the water system. The City has placed a high priority on this key component of the Water Conservation Program, and believes it has had a large impact on the reduction of unaccounted for water, and a significant impact on the decline in water pumpage. From 2012 to 2019, the program had targeted a replacement rate of approximately 1% to 2% of the system's 4,419 miles of pipe each year. During Cove-19 Pandemic of 2020, about 26 miles of old water mains were replaced. The following table shows the past and current miles of main replaced per year.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Miles of Pipe Laid	30.0	30.0	70.0	75.0	85.0	90.0	90.0	90.0	90.0	56.9	25.59

HYDRANT CUSTODIANS

The City has historically experienced difficulty in deterring people from opening hydrants illegally during hot summer days. In order to minimize this problem, the City began installing hydrant custodians in areas where previous experience indicated that open hydrants may be a problem. This program had to be coordinated with the Fire Department to insure that the hydrants would always be available for fighting fires.

The City has installed over 20,000 hydrant custodians on the City's 48,141 hydrants. The City has found that the hydrant custodians have had a very significant impact on illegal hydrant openings.

EDUCATION AND PUBLIC AWARENESS

The Department of Water Management engages in public education and awareness on a continuing basis. Conservation messages are conveyed through a variety of channels, including community meetings, literature distribution, and extensive use of the World Wide Web. Over the past years, we have included themes from the Chicago Water Agenda. This is a gathering of local initiatives, policies, programs and proposals that address issues of conservation, water quality and storm water management in a coordinated way. The Agenda applies not just to the City of Chicago, but to suburban communities and other cities across the Great Lakes region. We have also ramped up efforts in a promotional campaign to get conservations messages out to the public through various transportation ads and street signage advertising. Our metersave program message is quite visible throughout the city.

Coordinating with other City departments, the Department of Water Management has been including Agenda messages in the annual Consumer Confidence Report, in development of an educational program for schools, in grass roots presentations to community groups and Chambers of Commerce, and in other appropriate settings. Topics range from techniques of conservation to fire hydrant usages to the prospect of universal customer metering.

METER INSTALLATION AND MAINTENANCE

In the City, the number of metered accounts is increasing. In the end of 2019, the number of metered accounts was 329,375. During 2020 water accounting year, the Meter Save Program has been suspended while we continue to analyze data from our water quality study which related to new water meter installation. The water metering is the most effective way to conserve water. The City continued to service those meters presently installed on residential, commercial, industrial, and suburban municipal accounts. Maintenance of this large installed meter base requires a considerable commitment of manpower and equipment. The City is committed to maintaining its meters in conformance with the recommendation of the meter manufacturers and the AWWA.

ELIMINATION OF UNUSED SERVICES

The unused service connections are the potential sources of water leakage. The City continued its efforts to cut and seal unused services. Although the termination of unused water services is very expensive, the continued reduction in the number of unused services should help reduce the amount of unaccounted for water.

The following table shows the data for termination of unused services since 2010.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Number of Services Terminated	692	342	476	635	1540	1521	2256	1892	2510	163	121

LEAK DETECTION AND REPAIR

The Department has maintained a high level of effort in its leak detection program over the past years. By using the latest leak detection technology the Department can effectively locate the underground leaks.

The following table demonstrates the Department's efforts toward leak detection.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Miles of Pipe Surveyed	1220	1600	1900	1760	1162	1179	1501	1820	1773	1869	2114
Number of Underground Leaks Located	402	300	660	637	380	611	702	833	656	600	736

SCADA SYSTEM

The Supervisory Control and Data Acquisition (SCADA) system provides automation of water pumping and the better pressure management for the water distribution system. Today there are 84 remote pressure sensors installed in the distribution system. The sensors are continuously monitoring water pressure in real time for the entire service area of the City of Chicago. Also, there are eight additional continuously monitored points located mainly in the outlying areas to monitor water supply pressure and suburban water flow demand patterns. These pressure sensors have proven to be a great aid with pumping station operation by avoiding over pressurizing the system that in turn is believed to contribute to significant savings in water usage.

VARIABLE SPEED ELECTRIC DRIVES

The Chicago water system has 12 pumping stations. Nine of the pumping stations have pumps that are driven by electric motors, and five of these electric powered stations are equipped with electronically controlled variable speed drives. The variable speed drives allow the operating staff to efficiently adjust water pumpage without over pressurizing the water distribution system, which reduces water main breaks and wasting of water. The remaining three stations are steam powered with manually controlled pumps. The plan is to convert these stations to electrical power with variable speed drives. The conversion of the Central Park Pumping Station will be completed in 2021. The next steam powered station, Western Ave. Pumping Station, will follow soon after the Central Park Pumping Station conversion. The design for the conversion of the final steam pumping station, Mayfair Ave. Pumping Station, is slated to begin in 2022.