



**OFFICE OF INSPECTOR GENERAL**  
*City of Chicago*



***REPORT OF THE OFFICE OF INSPECTOR GENERAL:***

\*\*\*\*\*

***DEPARTMENTS OF WATER MANAGEMENT AND FINANCE  
WATER SERVICE ACCOUNT INVENTORY AND REVENUE  
AUDIT***

**JUNE 2015**

866-IG-TIPLINE (866-448-4754)  
[www.chicagoinspectorgeneral.org](http://www.chicagoinspectorgeneral.org)



**OFFICE OF INSPECTOR GENERAL**  
*City of Chicago*

Joseph M. Ferguson  
*Inspector General*

740 N. Sedgwick Street, Suite 200  
Chicago, Illinois 60654  
Telephone: (773) 478-7799  
Fax: (773) 478-3949

---

June 15, 2015

To the Mayor, Members of the City Council, City Clerk, City Treasurer, and residents of the City of Chicago:

The City of Chicago Office of Inspector General (OIG) has completed an audit of water service management. The Department of Water Management (DWM) is responsible for providing water to over 490,000 accounts in the city and suburbs, generating over \$620.5 million in annual revenue. OIG examined DWM's practices related to water service installation, account setup, and billing for temporary usage of water from fire hydrants. In addition, we reviewed the Department of Finance's (DOF) account maintenance and classification practices.

OIG concluded that DWM maintained a complete inventory of the properties receiving water service and uploaded 100% of data from meter reads to its billing system in a timely manner.

However, the audit also found that,

- DWM failed to charge for water used during construction of new privately-owned buildings from June 2008 through December 2014, resulting in lost revenue of an estimated \$3.9 million;
- DWM provided non-metered water service to non-residential buildings and residential buildings with three or more units in violation of Municipal Code of Chicago (MCC) § 11-12-210;
- DOF failed to bill and/or collect payment from 26 accounts that were incorrectly coded as inactive or permanently removed, resulting in an undercollection of \$330,981;
- Gaps in DWM's account verification process could allow future customers to receive water without being billed; and
- DWM charged a fee for hydrant permits that is approximately one-third the rate prescribed in the MCC and issued fee waivers that are not expressly authorized by the MCC.

DWM and DOF have committed to important system and process improvements in response to these findings and OIG's recommendations.

We thank the staff and management of DWM and DOF for their cooperation during this audit and we thank the Department of Buildings for explaining its role in issuing permits related to water service.

Respectfully,

A handwritten signature in blue ink, appearing to read 'J. Ferguson', with a stylized flourish at the end.

Joseph M. Ferguson  
Inspector General  
City of Chicago

**TABLE OF CONTENTS**

**I. EXECUTIVE SUMMARY .....2**

**II. BACKGROUND .....4**

**A. Departmental Overview .....4**

**B. Metered and Non-Metered Accounts.....4**

**C. Meter Reading Process .....5**

**D. Meter Read Exception Processing .....6**

**E. New Water Service Installation Process.....6**

**III. OBJECTIVES, SCOPE, AND METHODOLOGY .....8**

**A. Objectives.....8**

**B. Scope.....8**

**C. Methodology .....8**

**D. Standards .....9**

**E. Authority and Role.....9**

**IV. FINDINGS AND RECOMMENDATIONS ..... 11**

**Finding 1: DWM uploaded 100% of meter read data to its billing system in a timely manner..... 11**

**Finding 2: Beginning in June 2008, the City did not charge a permit or use fee for water used during private construction activities, resulting in estimated lost revenue of \$3.9 million. .... 12**

**Finding 3: DWM provided non-metered service to some nonresidential buildings and residential buildings with more than two units in violation of MCC § 11-12-210..... 14**

**Finding 4: The City provided \$330,981 of water service to some properties without collecting payment from the property owners..... 16**

**Finding 5: DWM had a complete inventory of water service accounts, but gaps in the account verification process could allow future new customers to receive water without being billed..... 18**

**Finding 6: DWM charged only one-third of the daily rate required by the MCC for temporary use of water from hydrants; issued fee waivers without express MCC authorization and; failed to track hydrant permit revenue. .... 19**

**Acronyms**

AMR	Automatic Meter Read
CCAO	Cook County Assessor’s Office
DOB	Department of Buildings
DOF	Department of Finance
DWM	Department of Water Management
MCC	Municipal Code of Chicago
MIU	Meter Interface Unit
OIG	Office of Inspector General

## **I. EXECUTIVE SUMMARY**

The Office of Inspector General (OIG) conducted an audit of the City of Chicago's water service focusing on account inventory, meter reading, and temporary water usage practices. The Department of Water Management (DWM) provides and manages water access while the Department of Finance (DOF) manages billing. The Municipal Code of Chicago (MCC) authorizes non-metered water service provision to single family homes and two-unit residences at a rate based on property characteristics rather than water usage. All other structures—old and new—are to receive metered water service. The City's water system currently serves over 490,000 accounts in the city and suburbs.

The objectives of the audit were to determine whether the City,

- recorded meter read data in its water billing system in a timely manner;
- maintained a complete and accurate inventory of all locations receiving water service; and
- billed the legally required rate for temporary water usage from fire hydrants.

We found that DWM uploaded 100% of meter read data to the City's water billing system in a timely manner, which is a critical step in the billing process. However, we also found that DWM allowed an estimated \$3.9 million in free water use at private construction sites from June 2008 through December 2014. The revenue loss occurred because a permit fee for water used during construction activities was eliminated and the Department did not require property owners to install meters immediately after receiving a DWM water service connection.

In addition, we found that DWM was providing non-metered service to non-residential buildings and residential buildings with more than two units in violation of the MCC. DWM informed OIG that it identified 2,513 noncompliant, non-metered accounts in April 2011 and had worked to reduce that number to 837 by May of 2014. However, OIG's examination of active accounts found that DWM had not identified all noncompliant non-metered accounts. Moreover, we found that DWM lacked a formal strategy for bringing noncompliant accounts into compliance in a timely manner.

We also found that the City provided \$330,981 of water service to properties without collecting payment from property owners. DOF assigned an "inactive" status to accounts for 38 properties that were, in fact, receiving water service or had all necessary structures in place to receive water service. As a result, DOF failed to collect revenue for water used at 26 of those properties. DOF also lacked sufficient safeguards to prevent inappropriate classification of accounts as "permanently removed," a classification limited to accounts for demolished buildings.

We reviewed a sample of water accounts and concluded that DWM maintained a complete inventory of properties with water service installed. However, we found gaps in the account verification process for new installations that could allow customers to receive water without being billed, although OIG saw no evidence that such an error has occurred.

Finally, we determined that DWM's billing practices for temporary water usage from hydrants did not comply with the MCC. Specifically,

- DWM charged only one-third the rate prescribed by the MCC; and
- DWM granted fee waivers that are not authorized by the MCC.

In addition, DWM did not reliably track revenue generated from hydrant permits. As a result, we were unable to calculate the revenue lost due to DWM's practices of granting fee waivers and charging a lower rate than required by the MCC.

OIG concluded that DWM effectively executed two processes that are crucial to the billing process—account creation and timely meter reading. However, DWM did not adequately charge for water use on private construction sites and hydrants, and gaps in DOF's account status controls allowed some users to receive free water. OIG recommends that DWM ensure that all non-exempt customers are billed for water, bring all noncompliant, non-metered accounts into compliance with the MCC, and correct its billing practices related to hydrant permits. We recommend that DOF consider additional safeguards to prevent or detect inappropriate account classifications that could result in a failure to bill all accounts for water service.

In response to our audit findings and recommendations, DWM committed to begin requiring meter installations at the time new water service is requested and to take appropriate enforcement actions against noncompliant, non-metered accounts. DWM also stated that it will work with City Council to simplify the temporary water usage fee structure in order to ensure that it collects the appropriate fees for hydrant permits. DOF stated that it has created a weekly report that identifies accounts that may have been inappropriately deactivated for further review. DOF also stated that it has already reduced the number of users who can mark an account as permanently removed and will evaluate the feasibility of validating that the properties associated with permanently removed accounts were actually demolished.

The specific recommendations related to each finding, and responses from DWM and DOF, are described in the "Audit Findings and Recommendations" section of this report.

## II. BACKGROUND

### A. Departmental Overview

DWM and DOF collaborate to provide water service and manage billing and payment for over 490,000 accounts in Chicago and the surrounding suburbs. DWM is responsible for installing water connections, providing water, inspecting connections and meters, reading meters, and recording meter read data in the City's billing system. DOF collects water service payments and provides billing-related customer service on behalf of DWM. The City uses an enterprise fund, referred to as the Water Fund, to account for the revenues and expenses of its water system. Similar to a commercial enterprise, the Water Fund uses water fees to cover operating expenses, maintenance, and debt service costs.<sup>1</sup>

In 2013, DWM generated \$620.5 million from water fees, an increase of 40.4% from 2011.<sup>2</sup> The City increased water rates by 25% in 2012, and 15% in 2013, 2014, and 2015.<sup>3</sup> Rates will be linked to the Consumer Price Index<sup>4</sup> beginning in 2016.<sup>5</sup> Currently, the City charges a sewer fee equal to 100% of the water charge accrued during the billing period and includes that fee on each water bill.<sup>6</sup> Because our audit did not include sewer service and billing, all the fees, charges, and revenues discussed in this report refer solely to those related to the City's water system and accounted for in its Water Fund.

### B. Metered and Non-Metered Accounts

The City of Chicago provides water service to both metered and non-metered accounts. According to DWM records, the Department was providing service to 220,515 metered accounts and 273,568 non-metered accounts as of January 2014. DOF bills non-metered accounts on a semiannual basis using a formula that includes the size of the building and number of water fixtures. Depending on property type, DOF bills metered accounts on a monthly, bi-monthly, or quarterly basis, based on actual or estimated water usage.<sup>7</sup> Unlike non-metered accounts, metered accounts allow DWM to track water usage, find leaks, and measure capacity. The

---

<sup>1</sup> The City also uses enterprise funds to account for the City's sewer system and the Midway and O'Hare airports. See City of Chicago, "Annual Financial Analysis 2014," 31-33, accessed March 24, 2015,

[http://www.cityofchicago.org/content/dam/city/depts/obm/supp\\_info/2015Budget/AFA\\_2014\\_Final\\_web.pdf](http://www.cityofchicago.org/content/dam/city/depts/obm/supp_info/2015Budget/AFA_2014_Final_web.pdf).

<sup>2</sup> Water fees constituted 97.4% of the Water Fund's 2013 operating revenue of \$637.1 million. In 2011, the Water Fund received \$441.8 million, or 97.3%, of its total operating revenue of \$454.2 million from water fees. See City of Chicago, Department of Water Management, "Water Fund Comprehensive Annual Financial Report For the Years Ended December 31, 2013 and 2012," 19 and 45, accessed March 24, 2015,

[http://www.cityofchicago.org/content/dam/city/depts/fin/supp\\_info/CAFR/2013/Water2013.pdf](http://www.cityofchicago.org/content/dam/city/depts/fin/supp_info/CAFR/2013/Water2013.pdf).

<sup>3</sup> City of Chicago, Department of Water Management, "Water Sewer Rates," accessed March 24, 2015, [http://www.cityofchicago.org/city/en/depts/water/provdrs/cust\\_serv/svcs/know\\_my\\_water\\_sewerrates.html](http://www.cityofchicago.org/city/en/depts/water/provdrs/cust_serv/svcs/know_my_water_sewerrates.html).

<sup>4</sup> The Consumer Price Index is a measure of inflation calculated by the U.S. Bureau of Labor Statistics. Department of Labor, Bureau of Labor Statistics, "Consumer Price Index Frequently Asked Questions," accessed March 24, 2015, <http://www.bls.gov/cpi/cpifaq.htm>.

<sup>5</sup> MCC § 11-12-315.

<sup>6</sup> City of Chicago, Department of Water Management, "Water Sewer Rates," accessed March 24, 2015, [http://www.cityofchicago.org/city/en/depts/water/provdrs/cust\\_serv/svcs/know\\_my\\_water\\_sewerrates.html](http://www.cityofchicago.org/city/en/depts/water/provdrs/cust_serv/svcs/know_my_water_sewerrates.html).

<sup>7</sup> City of Chicago, Department of Finance, "Understanding Your Water Bill," accessed March 24, 2015, [http://www.cityofchicago.org/city/en/depts/fin/supp\\_info/revenue/water\\_division\\_services/understanding\\_yourwater\\_bill.html](http://www.cityofchicago.org/city/en/depts/fin/supp_info/revenue/water_division_services/understanding_yourwater_bill.html).

Department is currently in the process of replacing old meters, which DWM rate takers must visually read and record. The new automatic meter read (AMR) meters have transmitters called Meter Interface Units (MIU) that allow rate takers to automatically collect data when near a metered property. According to DWM management, 211,603 of the 220,515 metered accounts, or 96.0%, had AMR meters as of March 2014.

In 2009, DWM launched the Meter Save program to encourage owners of single family homes and two-unit residential buildings to voluntarily sign up for metered service. DWM guarantees that the customer will not be billed more than the non-metered rate for the first seven years after installation and does not charge customers for the meter or installation.<sup>8</sup> DWM management told OIG that the Department received approximately 57,000 meter installation requests and installed 48,000 meters between January 2009 and May 2014.

### **C. Meter Reading Process**

The meter reading process involves staff from DOF, DWM, and the vendors that administer the water billing and permit tracking databases on behalf of the City. The process differs slightly for AMR and non-AMR meters.

For AMR meters, the process is as follows:

1. DOF creates an AMR meter reading schedule based on billing cycles.
2. The vendor creates rate taker routes based on the AMR schedule and location data in the billing system.
3. The vendor uploads the routes to a File Transfer Protocol site.
4. DWM rate takers download the routes into a laptop-based meter reading application.
5. Rate takers drive the routes.
6. Depending on billing deadlines, rate takers may revisit parts of the routes to capture any missed reads.
7. Rate takers send meter read data to the vendor who loads it into the billing system.
8. DOF processes any meter read exceptions and bills each account.<sup>9</sup>

For non-AMR meters, the process is as follows:

1. DOF creates a non-AMR meter reading schedule based on billing cycles.
2. The vendor creates rate taker routes based off the non-AMR schedule and location data in the billing system.

---

<sup>8</sup> City of Chicago, Department of Water Management, "MeterSave: Frequently Asked Questions," accessed March 24, 2015, <https://www.metersave.org/faqs.aspx>.

<sup>9</sup> Meter read exceptions occur when rate takers are unable to obtain water usage data or the billing system flags a read as potentially inaccurate.



3. Rate takers download the route to their handheld devices containing the non-AMR software.
4. Rate takers visually read the meters and enter the water usage data into the non-AMR software.
5. Rate takers upload water usage data into the billing system.
6. DOF processes any meter read exceptions and bills each account.

#### **D. Meter Read Exception Processing**

According to DOF management, AMR meters automatically generate trouble codes if the meter is not functioning properly.<sup>10</sup> For non-AMR meters, rate takers manually enter trouble codes when they cannot obtain water usage data. In addition, the City's billing system contains tolerance thresholds that identify potentially inaccurate reads.<sup>11</sup> DOF refers to meter reads that generate trouble codes, or that the billing system flags as potentially inaccurate, as meter read exceptions.

DOF has a defined process to investigate and correct the underlying issues that lead to a meter read exception. In the case of excessively high or low reads, DOF holds the bill temporarily while DWM rate takers attempt to verify the original meter read. If a rate taker is able to determine the correct reading within a certain time period, DOF bills on an actual basis. If the rate taker is unable to determine the correct reading, DOF bills on an estimated basis and generates an inspection service order directing DWM to find the cause of the high or low reading. For all other meter read exceptions, DOF bills on an estimated basis and generates service orders requesting DWM inspect the meter, diagnose, and fix the problem. Based on data provided by DOF, OIG estimates that 10.9% of all metered bills in 2012 and 2013 were for estimated, not actual, usage.

#### **E. New Water Service Installation Process**

The Department of Buildings (DOB) manages the permitting process for new water service installations. Before obtaining a permit for new water service, the property owner's general contractor must obtain a building permit from DOB and a street cut permit from the Chicago Department of Transportation. Once those initial permits have been secured, the property owner's plumbing contractor may apply to DOB for a water service installation permit. DOB staff review the permit application, assess the type of service required, collect permit fee payment, and enter the permit details into the DWM database used to track permits and service orders related to water and sewer work.

After DOB approves a water service installation permit, the property owner's plumbing contractor schedules a DWM crew to tap into the water main.<sup>12</sup> Once this is complete, the

---

<sup>10</sup> OIG did not test trouble code creation and resolution in this audit and therefore has not validated this assertion.

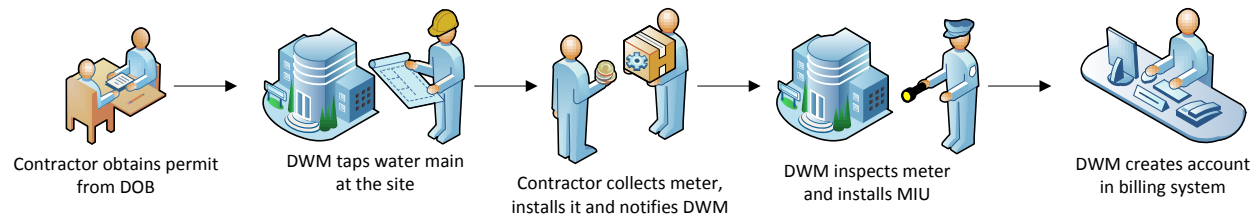
<sup>11</sup> The system compares an individual account's water usage data to average usage data from the previous 24 readings to determine if the reading is consistent with historical usage. Thresholds vary depending on the type of account.

<sup>12</sup> DWM does not allow private contractors to tap water mains.

plumbing contractor is responsible for laying the pipe from the tap to the building. Next, DWM creates a new water service account using the following process:

1. The plumbing contractor obtains a water meter from the DWM meter shop.
  - a. A DWM laborer updates the DWM database with the meter serial number and pick-up date.
  - b. The DWM laborer provides the contractor with a “set” card.
  - c. Contractor mails the “set” card back to the meter shop within 14 days of pick up, confirming the date the meter was set.
2. The plumbing contractor installs the meter and returns the set card to DWM.
3. A second DWM employee visits the property to inspect the meter and install the MIU that allows automatic meter reading.
  - a. The employee updates the work order’s status in the permit database.
  - b. The employee notifies another DWM employee that the control process is complete.
4. The third DWM employee verifies the data in the permit database and creates a new account in the City’s water billing system.

The following diagram summarizes the new water account process.



Source: OIG analysis of documents provided by DWM

### **III. OBJECTIVES, SCOPE, AND METHODOLOGY**

#### **A. Objectives**

The objectives of the audit were to determine whether the City,

- recorded meter read data in its water billing system in a timely manner;
- maintained a complete and accurate inventory of all locations receiving water service; and
- billed the legally required rate for temporary water usage from fire hydrants.

#### **B. Scope**

OIG evaluated the completeness and accuracy of the inventory of accounts in the water billing system as of January 2014. We also reviewed DWM's account verification process and DOF's account maintenance protocol in 2014. In addition, we reviewed DWM's billing practices for permits to temporarily use water from fire hydrants from 2011 to 2014.

OIG did not assess the mechanical or technical accuracy of meter reads or the accuracy of bills issued by DOF.

#### **C. Methodology**

We interviewed staff from DOF, DWM, and the vendors that manage DWM's account inventory and permit systems to gain an understanding of the water service installation, account creation, meter reading, and billing processes.

To determine if DWM uploaded 100% of meter read data to the billing system in a timely manner, we reviewed a random sample of metered accounts and compared the scheduled meter read date to the actual meter read date recorded in the billing system.

OIG relied on permit fee data provided by DOB to estimate the amount of lost revenue related to temporary water usage during private construction from June 2008 through 2014.

To determine whether DWM provides non-metered service to any buildings required by the MCC to receive metered service, we reviewed a list of noncompliant, non-metered accounts provided by DWM. We then created our own list of potentially noncompliant accounts from the billing system, compared the two lists and asked DWM to explain discrepancies between the two lists.

To assess the accuracy of the City's water service account inventory, we compared all accounts that DOF deactivated from 2011 to 2013 to inventories of active and inactive accounts.<sup>13</sup> We also interviewed DOF and DWM management regarding the account inactivation and permanent removal process in order to assess the adequacy of safeguards implemented by DOF. In addition,

---

<sup>13</sup> To assess the reliability of account data provided by DWM and DOF, OIG compared random samples of account data from each report to account data in the billing system. We found the account data provided by both DWM and DOF to be sufficiently reliable for further analysis.

we compared a random sample of permanently removed accounts to property records available on the CCAO website to verify that the property did not contain any structures. If we were unable to verify the property's status on the CCAO website, we performed a visual inspection of the property.

To determine whether DWM maintains a complete inventory of properties receiving water, we reviewed a simple random sample of property records from the Cook County Assessor Office's (CCAO) database to verify that the City's billing system contained active accounts for all listed properties.<sup>14</sup> We interviewed DWM management to determine the process DWM used to install new water services and create new accounts in its billing and inventory system. We also interviewed DOB to understand the permitting process for new water services. In addition, we analyzed a report of water service installation permits generated by the vendor from DWM's permit tracking database.<sup>15</sup> We segmented the population based on risk factors, selected three random samples, and compared the permit data to data in the billing system to determine if DWM created accounts for all locations with newly installed water services. We also performed visual inspections of properties, when necessary, to determine the type of building present and asked DWM staff to explain discrepancies we discovered.

To determine whether DWM charged the appropriate rate for hydrant permits that authorize temporary water usage, OIG interviewed DWM and DOB staff and compared their descriptions to the requirements outlined in the MCC.<sup>16</sup>

#### **D. Standards**

We conducted this audit in accordance with generally accepted Government Auditing Standards issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

#### **E. Authority and Role**

The authority to perform this audit is established in MCC § 2-56-030 which states that the Office of Inspector General has the power and duty to review the programs of City government in order to identify any inefficiencies, waste, and potential for misconduct, and to promote economy, efficiency, effectiveness, and integrity in the administration of City programs and operations.

The role of OIG is to review City operations and make recommendations for improvement.

---

<sup>14</sup> To assess the reliability of CCAO property data provided by the City's Department of Innovation and Technology, we compared a random sample of property data to data available via the CCAO online portal. We found the property data to be sufficiently reliable for further analysis.

<sup>15</sup> To assess the reliability of the water service installation permit report provided by DWM, OIG interviewed staff with responsibility to enter data into DWM's permit tracking database and track water and sewer permits. We determined the report was unreliable because DWM did not consistently update permit statuses or identify the specific type of work authorized by each permit.

<sup>16</sup> OIG assessed the reliability of a hydrant permit fee report generated from the permit database. We found that several fee entries did not match the fee schedule set by DWM. As a result, OIG classified the fee data as unreliable for the purposes of calculating the revenue collected for hydrant permits.

City management is responsible for establishing and maintaining processes to ensure that City programs operate economically, efficiently, effectively, and with integrity.

#### IV. FINDINGS AND RECOMMENDATIONS

**Finding 1: DWM uploaded 100% of meter read data to its billing system in a timely manner.**

OIG reviewed a random sample of accounts active as of April 2014 and determined that 100% had meter read data successfully uploaded within 7 days of the scheduled read date.<sup>17</sup>

DOF relies on this meter read data, uploaded by DWM rate takers, to bill metered accounts. Meter read data typically consists of water usage data, but also includes error codes that identify potential problems with the meter or the MIU. DOF uses error codes to prioritize problems and create work orders that request inspections and repairs to be performed by DWM staff. Uploading complete meter read data in a timely manner allows DOF to execute its role as the billing and customer service agency for water service in the City.

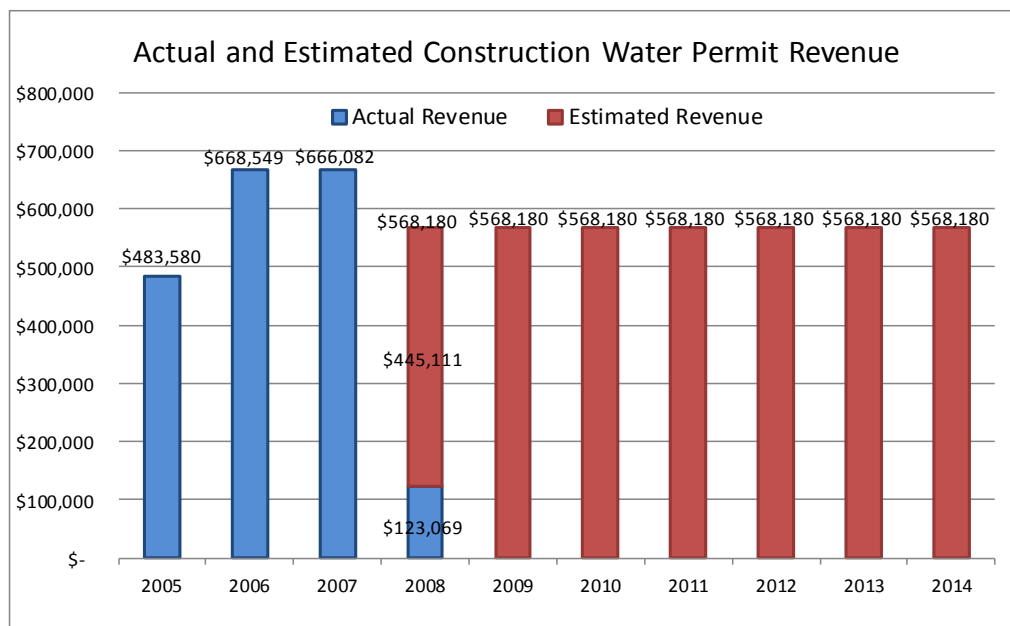
---

<sup>17</sup> OIG selected a simple random sample of 100 accounts, but one account was removed because its meter was not installed until after the scheduled read date selected by OIG. Based on the sample results, we are 95% confident that meter read data was uploaded within 7 days of the scheduled read date for at least 97% of the 223,740 metered accounts active in April 2014.

**Finding 2: Beginning in June 2008, the City did not charge a permit or use fee for water used during private construction activities, resulting in estimated lost revenue of \$3.9 million.**

DWM did not charge property owners for unmetered water used during construction of private property over the course of more than six years. DWM allowed property owners to use water after the Department had installed a new water service but before the plumbing contractor installed a water meter, despite the MCC requirement that all new water service be metered. DWM believed that DOB building permits included a fee for water access during construction. However, in 2008 an amendment to the MCC eliminated this part of the building permit fee and DWM and DOB did not institute an alternative method for collecting revenue for water used during private construction work. Therefore, fees for such water usage were not charged, nor revenues collected, after June 2008.<sup>18</sup>

DWM cannot quantify the amount of water used during this period because it was unmetered. However, OIG estimated the amount of permit fee revenue lost due to the June 2008 amendment to the MCC. We estimated lost revenue of \$3.9 million from June 2008 through December 2014, based on the monthly average permit fee revenue DOB collected for water use during private construction from January 2005 through May 2008.<sup>19</sup> (For reference, \$3.9 million is approximately 0.12% of total water sales revenue from June 2008 through December 31, 2014.) The following graph shows the actual and estimated permit revenue from 2005 to 2014.



Source: OIG analysis of data provided by DOB

<sup>18</sup> As a result of this audit, DWM plumbing inspectors have begun advising building contractors that they may not use non-metered water during construction.

<sup>19</sup> Actual revenue collected in 2008 was \$123,059 through May, when the MCC was amended. We estimated the remaining \$445,111 for 2008 to arrive at the \$568,180 annual estimate. Due to a discrepancy in revenue data provided by DOF, described below, OIG relied on fee data provided by DOB to estimate revenue from water used during private construction. Due to limitations in the data, OIG could not control for potential confounding variables that would have impacted the estimate. For example, this estimate does not take into account the decline in new construction after 2007 or the increase in water fees since 2008.

In addition to the ongoing free water use, OIG found a large discrepancy between the amount DOB invoiced in 2006 for construction water permits (\$668,549) and the amount of revenue DWM received that same year (\$6,636). Based on DOF's inquiry into this issue when raised by OIG during the audit, it appears that this resulted in a misallocation of \$661,913. Staff within the Payment Processing Division of DOF reached this conclusion after researching two permits and finding that DOB had miscoded the revenue source. As a result, DOF had allocated the revenue to the Corporate Fund rather than the Water Fund. A DWM employee had in fact noticed and reported the discrepancy back in 2006, but the Department had not determined its cause. After OIG noted the discrepancy again during this audit, DWM stated that it was "working with the appropriate departments to rectify the situation."

**Recommendation:**

We recommend that DWM consider the feasibility of requiring meter installation immediately upon receipt of new water services. If DWM determines such a requirement to be infeasible, it should develop a mechanism to prevent unauthorized use of water during private construction.

In addition, we recommend that DWM develop procedures to ensure all revenues collected on its behalf are completely and accurately recorded in its financial records. Finally, the Department should determine what, if any, action it should take to recoup the permit fee payments the City received but that were ultimately misallocated because of coding errors.

**Management Response:**

*"The Department of Water Management (DWM) is changing its business process to require meter installation at the time of the tap for a new service into the City's water main, and DWM is in the process of developing an ordinance that will clarify and confirm this practice in the Code. This will allow for a water account to be set-up and the cost of actual water usage to be accounted for in the billing and customer service system immediately upon the commencement of service.*

*Water usage fees for water used in construction accounted for a small percent of Water Fund revenues. As discussed above, DWM is changing its business process to require meter installation at the time of the tap for a new service into the City's water main. In addition to more accurately accounting for water usage and preventing unauthorized use of water, this change in practice will eliminate the need to apply funds from water construction permit fees to the Water Fund. DOF and DWM will continue to accurately account for these revenues.*

*DWM and DOF are working together to determine what action, if any, should be taken to recover water used on construction permit fee payments that may have been allocated to the Corporate Fund in prior years."*



**Finding 3: DWM provided non-metered service to some nonresidential buildings and residential buildings with more than two units in violation of MCC § 11-12-210.**

MCC § 11-12-210 requires the installation of a meter on all water service pipes installed after September 15, 1982 and requires property owners to have meters installed on all water service pipes serving existing non-residential buildings and residential buildings with more than two units. DWM informed OIG that it identified 2,513 noncompliant, non-metered accounts in April 2011 and had worked to reduce that number to 837 by May of 2014. OIG determined, however, that the list of noncompliant buildings was incomplete.

OIG identified an additional 938 non-metered accounts with service classifications that indicated the accounts potentially served non-residential buildings or residential buildings with three or more units. While confirmation would require physical inspection of the properties, DWM management reviewed a sample of 183 of these accounts and determined that 40% may require a meter.<sup>20</sup> DWM explained that its list may be incomplete because the underlying data may not accurately describe relevant property characteristics and that visual inspections of properties would be necessary to determine the need for meters.

DWM management stated that a lack of cooperation by some property owners was the most significant barrier to meter installation. DWM told OIG that it had sent multiple notifications to noncompliant property owners and explained that the remaining account transitions will be challenging because they require extensive construction or plumbing work. While the Department stated that it issued citations to property owners for failing to allow DWM access to their property, it did not have guidelines specifying when to issue a citation. Overall, the discussion with DWM revealed that it did not have a formal strategy or defined deadline to identify and bring the remaining buildings into compliance. Because it has failed to fully enforce MCC § 11-12-210, DWM is unable to measure the water usage of those accounts and fails to encourage conservation by those account holders.<sup>21</sup>

**Recommendation:**

DWM should develop and document a cost-effective strategy to enforce MCC § 11-12-210 by identifying the complete population of noncompliant, non-metered water service accounts and transitioning the accounts to metered service. The strategy should include tactics designed to overcome barriers and criteria that dictate when to implement specific tactics—including but not limited to procedures authorized under the MCC and the Illinois Administrative Code—as well as a goal for completion of the project.

**Management Response:**

*“DWM will continue to actively investigate and pursue enforcement where necessary against all potential non-compliant non-metered accounts, including those additional accounts identified*

---

<sup>20</sup> Due to the sampling methodology employed, we cannot project these sample results to the population.

<sup>21</sup> DWM management stated that meters encourage conservation by consumers and allow the Department to monitor usage and identify leaks or other problems.

during the OIG's audit. For each of these accounts, DWM conducts an investigation to determine,

- a) *The type of property (service class);*
- b) *Whether a meter is required for the type of property;*
- c) *Whether the property is vacant or occupied;*
- d) *Whether a meter is installed and if yes, if the meter is AMR and properly operating; and*
- e) *Whether the property is current on its water bill*

*If it is determined that the account should be metered, DWM provides notice to the owner and the opportunity to comply. If the property owner fails to install a meter, the matter is referred to the DWM Attorney. The DWM Attorney then initiates and proceeds with the Administrative Hearings enforcement process. If the Administrative Hearings enforcement process is unsuccessful, DWM seeks to terminate the water service to the property. Restoration of the water service is contingent on a meter installation.”*

**Finding 4: The City provided \$330,981 of water service to some properties without collecting payment from the property owners.**

OIG examined all water accounts deactivated between 2011 and 2013 and found 38 that should have been active, resulting in \$330,981 of lost revenue.

Water accounts are typically deactivated when a property has been sold (and a new account associated with the property is created for the new owner) or a building is demolished. They may also be temporarily deactivated for administrative purposes such as account maintenance. From 2011 to 2013 DOF updated 89,107 accounts to an inactive status and coded 5,126 accounts as “permanently removed,” signifying that the building was demolished. OIG reviewed all of the inactive accounts and 100 of the permanently removed accounts<sup>22</sup> to determine whether the associated properties received water service. We determined the following:

- Thirty-eight properties associated with inactive accounts (or 0.04% of all deactivated accounts) were, in fact receiving water service or had all necessary structures in place to receive water service. DOF examined the 38 accounts identified by OIG to determine why they were not active. As shown in the table below, of the 38 accounts, 26 had billable water usage. DOF did not know why 18 of the accounts were deactivated, but it was able to determine another 14 were deactivated for account maintenance and never reactivated, 5 were new accounts that had never been activated, and 1 was a parsonage misidentified as a church (churches are exempt). DOF calculated that it failed to collect \$330,981 for billable water usage to 26 of those properties, 25 of which were neither billed nor collected, and began billing property owners for prior usage. (For reference, \$330,981 is 0.02% of total water revenue from 2011 to 2013.)

Reason Account was Inactive	Number of Accounts	Number of Accounts with Billable Water Usage	Amount Not Collected
Account deactivated for unknown reason	18	15	\$214,591
Account deactivated for account maintenance but not reactivated	14	6	\$103,805
New account not activated	5	4	\$7,937
Account misidentified as church account instead of parsonage account	1	1	\$4,648
<b>Totals</b>	<b>38</b>	<b>26</b>	<b>\$330,981</b>

Source: OIG analysis of water accounts and DOF data

- None of the properties coded as “permanently removed” were receiving water service. However, OIG found that DOF lacks adequate safeguards to prevent inappropriate classification of accounts as permanently removed. According to DOF, 175 system users are able to mark accounts as permanently removed in the billing system, but only three employees are assigned those responsibilities. Providing system access to users who do not require access to fulfill their job duties creates an unnecessary risk that an account could be inappropriately marked as permanently removed.<sup>23</sup>

<sup>22</sup> OIG selected a simple random sample of 100 properties. Based on the sample results, we are 95% confident that no more than 2.9% of all accounts “permanently removed” between 2011 and 2013 may have received water service.

<sup>23</sup> In addition, DOF management told OIG that accounts are only marked as removed once DWM sends a copy of an inspection record confirming that the building associated with the account has been demolished and the water

**Recommendation:**

DOF should continue its efforts to collect the \$330,981 that should have been billed on 26 accounts. OIG also recommends that DOF develop a method to detect or prevent the inappropriate classification of accounts as inactive. In addition, DOF should work with the vendor that administers its billing system to limit the number of users who can mark accounts as permanently removed. Finally, DOF should consider whether it would be cost-effective to institute a process for periodically reviewing accounts marked as permanently removed to verify that staff appropriately classified those accounts.

**Management Response:**

*“We have back billed the accounts where we failed to complete a ‘move in’. Of the accounts back billed, 15 or 57.6% have made a payment. For all accounts, our standard collection process is in effect. We have implemented a weekly move out/move in report to monitor accounts that are set to inactive without a corresponding active account created.*

*We reduced access from 175 to 22 users. We are researching the feasibility of creating a special examination reason code for permanently removed. If that is possible, we should be able to reconcile against accounts that were classified as permanently removed.”*

---

service removed. DOF management stated that the Department does not periodically review accounts marked as permanently removed to verify that inspection records exist for the associated properties.

**Finding 5: DWM had a complete inventory of water service accounts, but gaps in the account verification process could allow future new customers to receive water without being billed.**

OIG observed 150 properties, compared them to DWM records, and found that 100% either had a water service account or were vacant lots and, therefore, would not require water service.<sup>24</sup> Based upon that review, we concluded that DWM appropriately maintains a complete account inventory of all properties with water service installed, a basic requirement for accurate and complete billing.

However, OIG discovered a gap in DWM's account verification process that could allow a new customer to receive water service without being billed. DWM ensures that it has created an account for each new water service by periodically comparing records in its permit tracking database to those in the billing system. There is no classification for a *new* water service installation in the permit database, however. DWM distinguishes new installations from repairs or inspections by examining only those permits that include a date when work was completed. If the date field for a new water service installation were left blank, DWM would not identify it as a new installation and would not confirm the related account had been created in the billing system. Although we identified this process gap, OIG did not find any instance in which a water service had been installed and an account had not been created.<sup>25</sup>

**Recommendation:**

DWM should design and implement a method to ensure that its account verification process identifies all new water service installations. Alternatively, if DWM began requiring immediate meter installation, as recommended in Finding 2, it could issue the meter and create an account in the billing system prior to the scheduled water service installation. Eliminating the delay between water service installation and account creation would minimize the need to detect errors after the fact. Given the complex logistics of water service installation, DWM should assess the feasibility and cost-effectiveness of this option.

**Management Response:**

*As in Finding 2, "The Department of Water Management (DWM) is changing its business process to require meter installation at the time of the tap for a new service into the City's water main, and DWM is in the process of developing an ordinance that will clarify and confirm this practice in the Code. This will allow for a water account to be set-up and the cost of actual water usage to be accounted for in the billing and customer service system immediately upon the commencement of service."*

---

<sup>24</sup> OIG selected a simple random sample of 150 properties. Based on the sample results, we are 95% confident that at least 98% of all eligible properties have a water service account.

<sup>25</sup> DWM did not require an account for private construction sites until a water meter was installed. DWM relied on DOB building permits to include a fee for water access during construction. This fee, however, was eliminated in 2008 as discussed in Finding 2.

**Finding 6: DWM charged only one-third of the daily rate required by the MCC for temporary use of water from hydrants; issued fee waivers without express MCC authorization and; failed to track hydrant permit revenue.**

*DWM charges one-third of the legally required rate for temporary water use from hydrants.*

In 2014, DWM charged a \$24.80 daily rate for temporary use of water from hydrants based on estimated usage of 1,000 cubic feet per day.<sup>26</sup> However, the rate required by MCC § 11-12-290 is nearly three times that rate (\$0.98 per 100 gallons of estimated consumption).<sup>27</sup> Based on an estimated usage of 1,000 cubic feet, DWM should bill hydrant users approximately \$73.31 per day (2.96 times higher than the current rate). DWM acknowledged that historically it has charged the metered rate for 1,000 cubic feet of water and in response to this audit intended to “work with the Law Department to address inconsistencies between practice and the [MCC.]”

*DWM issues fee waivers without authority to do so under the MCC.*

In addition, DWM issued fee waivers for block parties, festivals, and community gardens, allowing the use of fire hydrants free of charge, without express authorization by the MCC. While MCC § 2-8-065 allows individual fee waivers for permits associated with block parties, such waivers must first be authorized by an ordinance or an amendment to an ordinance. The MCC does not specifically authorize fee waivers for festivals or community gardens. DWM acknowledged that it has historically offered these fee waivers, and said it intended to work with relevant departments to “ensure a consistent approach to hydrant usage.”

*DWM fails to track hydrant permit revenue.*

DWM and DOF stated that they do not specifically track revenue from hydrant permits. The revenue is deposited in a “miscellaneous water payment” account within the Water Fund along with revenue from meter tests, small tap permit fees, and other sources. Currently, the payment data does not identify whether the payment was related to a hydrant permit or other fees. Therefore, OIG was unable to calculate the total forgone revenue related to the incorrect rate and fee waivers.

**Recommendation:**

DWM should correct the rates charged for temporary water usage to match the rates prescribed in MCC § 11-12-290. In addition, DWM should ensure its fee waiver policy complies with the MCC.

DWM should also work with DOF to assess the cost-effectiveness of implementing practices that would allow it to track hydrant permit revenue.

---

<sup>26</sup> Temporary water from hydrants is used, for example, to water community gardens, to control dust during demolition and street resurfacing, for street festivals and block parties.

<sup>27</sup> MCC § 11-12-290 makes an exception for temporary water use in connection with a building permit, but does not prescribe the rate DWM should charge for such use. DWM, however, is charging the same rate for all temporary water usage.

**Management Response:**

*“Following the OIG audit, DWM analyzed its existing practices and the Code in effect with respect to temporary water usage, and developed an alternate structure that we believe is fair and equitable and appropriately accounts for the estimated actual use of water. This improved and simplified structure would charge a flat rate for temporary water use from a fire hydrant. DWM is in now the process of developing an ordinance to implement this improved structure and will work with City Council to introduce and pass this amendment to the Code.*

*DWM no longer waives temporary water use fees. DWM is exploring the option of introducing an ordinance or amendment to address certain of these events and uses, as allowed under the MCC.*

*As discussed above, DWM is in the process of developing an ordinance that would simplify and charge a flat rate for temporary water use from a fire hydrant. This simplified process, together with the process and system changes discussed in Finding 2, will effectively facilitate more accurate and complete tracking of hydrant permits and related revenue.”*

## CITY OF CHICAGO OFFICE OF INSPECTOR GENERAL

<b>Public Inquiries</b>	Rachel Leven (773) 478-0534 <a href="mailto:rleven@chicagoinspectorgeneral.org">rleven@chicagoinspectorgeneral.org</a>
<b>To Suggest Ways to Improve City Government</b>	Visit our website: <a href="https://chicagoinspectorgeneral.org/get-involved/help-improve-city-government/">https://chicagoinspectorgeneral.org/get-involved/help-improve-city-government/</a>
<b>To Report Fraud, Waste, and Abuse in City Programs</b>	Call OIG's toll-free hotline 866-IG-TIPLINE (866-448-4754). Talk to an investigator from 8:30 a.m. to 5:00 p.m. Monday-Friday. Or visit our website: <a href="http://chicagoinspectorgeneral.org/get-involved/fight-waste-fraud-and-abuse/">http://chicagoinspectorgeneral.org/get-involved/fight-waste-fraud-and-abuse/</a>

### MISSION

The City of Chicago Office of Inspector General (OIG) is an independent, nonpartisan oversight agency whose mission is to promote economy, efficiency, effectiveness, and integrity in the administration of programs and operations of City government. OIG achieves this mission through,

- administrative and criminal investigations;
- audits of City programs and operations; and
- reviews of City programs, operations, and policies.

From these activities, OIG issues reports of findings, disciplinary, and other recommendations to assure that City officials, employees, and vendors are held accountable for the provision of efficient, cost-effective government operations and further to prevent, detect, identify, expose, and eliminate waste, inefficiency, misconduct, fraud, corruption, and abuse of public authority and resources.

### AUTHORITY

The authority to produce reports and recommendations on ways to improve City operations is established in the City of Chicago Municipal Code § 2-56-030(c), which confers upon the Inspector General the following power and duty:

*To promote economy, efficiency, effectiveness and integrity in the administration of the programs and operations of the city government by reviewing programs, identifying any inefficiencies, waste and potential for misconduct therein, and recommending to the mayor and the city council policies and methods for the elimination of inefficiencies and waste, and the prevention of misconduct.*