

July 29, 2016

**Audit Committee Members  
Mayor McMillan and City Council Members  
City of Clarksville  
Clarksville, Tennessee 37040**

**Executive Summary of Clarksville Gas & Water Utility Billing Audit**

The following is an executive summary of the objectives, findings and recommendations related to the internal audit report on CGW's utility billing process for the time period July 1, 2014, to June 30, 2015. The full audit report is attached and contains additional details about the audit results as well as management's responses. The full report also describes the audit methodology and provides more background and statistical information.

**Objectives of the audit**

The objectives of the audit were to determine the following in relation to the utility billing process:

- The accuracy of the billing process in accordance with approved rates
- The completeness of the customer base
- The adequacy of the design of the internal control system and whether or not it is operating effectively
- The safeguarding of proprietary information associated with the function
- Compliance with applicable laws and policies
- The accuracy of recording the related transactions in the financial records of the City

**Brief Background**

CGW provides water, sewer, and gas services to customers in Clarksville, Montgomery County and other surrounding areas based on service availability. Utility services are billed at City Council approved rates based on consumption of water (for water and sewer) and gas. Following regular (every 28-30 days) readings of water and gas meters, the consumption data retrieved is uploaded to the billing software utilized by CGW, where bills are calculated. Following bill calculations, CGW forwards billing information to a third party vendor who prints and mails invoices.

CGW uses enQuesta software for billing functions, which also serves as the main customer information system. The utility billing function as a whole relies on enQuesta for storing supporting information related to billing, as well as the actual billing calculation. For this reason, it is important that information contained in the software is accurate and reliable.

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## **Conclusions of Report**

**Our audit of Clarksville Gas and Water's utility billing process from July 1, 2014 to June 30, 2015 yielded the following results related to the original audit objectives.**

**The first audit objective was related to accuracy of the billing calculation in accordance with approved rates. Audit testing revealed that rates were properly entered into billing software without exception.**

**Regarding the completeness of the customer base, audit testing did not indicate significant weaknesses in this area.**

**The design and operation of internal controls related to utility billing need improvement in the areas of meter replacement and investigations, oversight of account set up, and segregation of duties surrounding billing adjustments. Most notably, billing adjustments did not receive a secondary review, adjustment miscalculations were identified, and errors were noted in account set up. Further, improvements could be made with regard to meter investigations and replacement policies.**

**The audit also found that billing software access controls should be improved to address the concerns noted below. Specifically, software access permissions and accompanying functions were not always closely matched to employee job functions, employee access to their current utility account was not restricted, and two employees were found to have multiple active operator numbers. Further, the employee termination process does not ensure that software access is removed timely.**

**CGW's processes for safeguarding proprietary information related to utility billing generally seem adequate with the exception of certain customer information. Employee access to customer information, including social security number, is not currently restricted to those who require the information to perform essential job functions.**

**CGW is generally compliant with applicable laws and policies; however, exceptions were noted during testing which indicate some departures. These anomalies, while limited, were found most notably in areas of meter testing and replacement, billing adjustment calculation, and after-hours activations.**

**When testing the accuracy of recording billing transactions in the City's financial records, audit procedures did not reveal any exceptions; however, the recorded transactions could be affected by other findings in this report.**

**Based on the audit results summarized above, we have made various recommendations for improvement which are detailed in the report. Recommendations include, but are not limited to, the following:**

- **Align internal control documentation to all five components of internal control outlined in the December 2015 Tennessee Internal Control and Compliance Manual.**

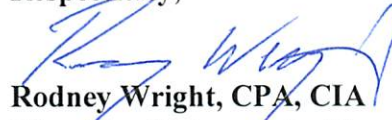
The five components are control environment, risk assessment, control activities, information and communication, and monitoring.

- Strengthen access controls surrounding enQuesta billing software.
- Implement appropriate segregation of duties and a documented secondary review step related to billing adjustments.
- Develop comprehensive written policies and procedures.
- Formalize the reporting process to outline reports needed for effective monitoring.
- Evaluate and enhance existing procedures in areas of meter investigation, meter replacement, and account set up.

The Internal Audit Department would like to thank the staff of Clarksville Gas and Water for their help and support during the performance of this audit. Their positive attitude facilitated the conduct of the audit and provides the necessary environment for process improvements to take place.

If further information about this audit is desired please contact Internal Audit at 931-648-6106.

Respectfully,



Rodney Wright, CPA, CIA  
Director of Internal Audit

cc: Charlie Gentry, Chief of Administration  
Laurie Matta, Chief Financial Officer  
Pat Hickey, General Manager, CGW  
Fred Klein, Senior Finance Director, CGW



## **INTERNAL AUDIT REPORT**

<b>AUDIT TITLE:</b>	<b>UTILITY BILLING</b>
<b>DEPARTMENT:</b>	<b>CLARKSVILLE GAS AND WATER</b>
<b>AUDIT PERIOD:</b>	<b>JULY 1, 2014 TO JUNE 30, 2015</b>

**CITY OF CLARKSVILLE  
CLARKSVILLE GAS AND WATER  
UTILITY BILLING  
AUDIT #1501**

*Stephanie Fox*

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Stephanie Fox - Auditor

*Rodney Wright*

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Rodney Wright - Director of Internal Audit

July 29, 2016

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Date

**CITY OF CLARKSVILLE  
INTERNAL AUDIT REPORT**

**CGW Utility Billing Audit  
July 1, 2014 to June 30, 2015**

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## **Internal Audit Report**

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### **Origin of the Audit**

This audit was conducted as a part of the annual audit plan approved by the Audit Committee for fiscal years 2015 and 2016.

### **Audit Objectives**

The specific audit objectives were to determine the following in relation to the billing process of Clarksville Gas and Water (CGW):

- The accuracy of the billing process in accordance with approved rates
- The completeness of the customer base
- The adequacy of the design of the internal control system and whether or not it is operating effectively
- The safeguarding of proprietary information associated with the function
- Compliance with applicable laws and policies
- The accuracy of recording the related transactions in the financial records of the City

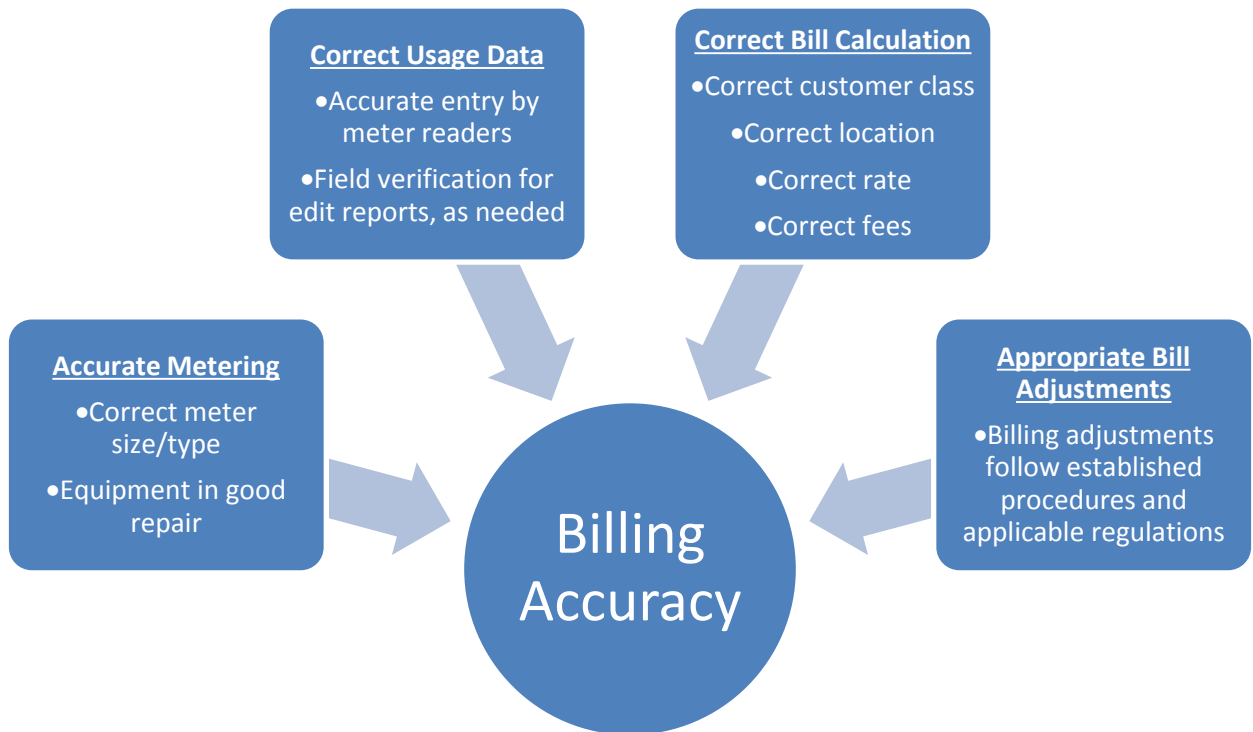
### **Scope and Methodology of the Audit**

The audit covered the time period from July 1, 2014 to June 30, 2015. The audit covered several areas integral to the utility billing process; however, procedures related to cash collections of utility bills were not included in the scope of the audit.

Evidence to support our conclusions was gathered from inquiries of management and staff as well as observations of source documentation and tests of the controls surrounding the billing process. Additionally, evidence was collected through analysis of billing and work order data. We also considered and evaluated the following components of internal control: the control environment, risk assessment, control activities, communication and information, and monitoring.

The utility billing process involves accuracy in many different areas within CGW, as demonstrated by Illustration 1 below. To gain appropriate evidence related to the objectives outlined above, audit procedures were designed to test areas of metering, billing, and customer service.

## Illustration 1



As test procedures varied over different areas, the auditor selected samples from different data sets, including existing accounts in billing software, work orders related to service initiation and disconnection, and billing adjustments. Samples for each audit procedure were selected randomly from the appropriate data set. As statistical sampling methods were not used, the auditor did not project results of tests to the population as a whole. Further, results should not be projected to the population.

## Statement of Auditing Standards

We conducted this performance audit in accordance with generally accepted government auditing standards. 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.

## Background

Clarksville Gas and Water provides gas, water, and sewer services to customers in Clarksville, Montgomery County, Cheatham County, Robertson County, and some portions of Kentucky. Services are provided based on availability in the area.



### **Rate Structure**

The City Council is responsible for setting the rates at which each utility service is billed. Rates differ by service, customer type, and customer location. There are certain exceptions, typically for industrial customers. A definition of each customer type is outlined in City Code.

Approved rates are published in the City Code and posted on the CGW website for customer convenience. While rates for each utility service have the same general structure, rates and their effective dates vary. Details regarding the rates of each utility type can be found in the paragraphs below.

### **Water Service**

Water usage is metered and meters are read every 28-30 days by CGW meter readers. Consumption for water is measured in gallons, with rates per 1,000 gallons. There is no change in usage rate with higher consumption. Additionally, City Code assesses a monthly customer charge based on meter size. There is no minimum water bill based on consumption.

The City Code section related to water rates was last updated on August 9, 2008. At that time the minimum usage for billing purposes was removed. As noted above, the rates differ by customer type and customer location.

### **Sewer Service**

Sewer usage is not metered; rather charges are based on water usage. City Code assesses a monthly environmental compliance fee of \$5.00 per month. Additionally, there is a minimum sewer bill based on 2,000 gallons of water usage.

Sewer rates are established in City Code. The current version of the City Code lists various sewer rates, the latest of which are effective July 1, 2016. The rate structure differs slightly from water, in that sewer rates do change as consumption increases. This is currently true only for outside city customers, where the rate per 1,000 gallons decreases slightly after the first 2,000 gallons.

### **Gas Service**

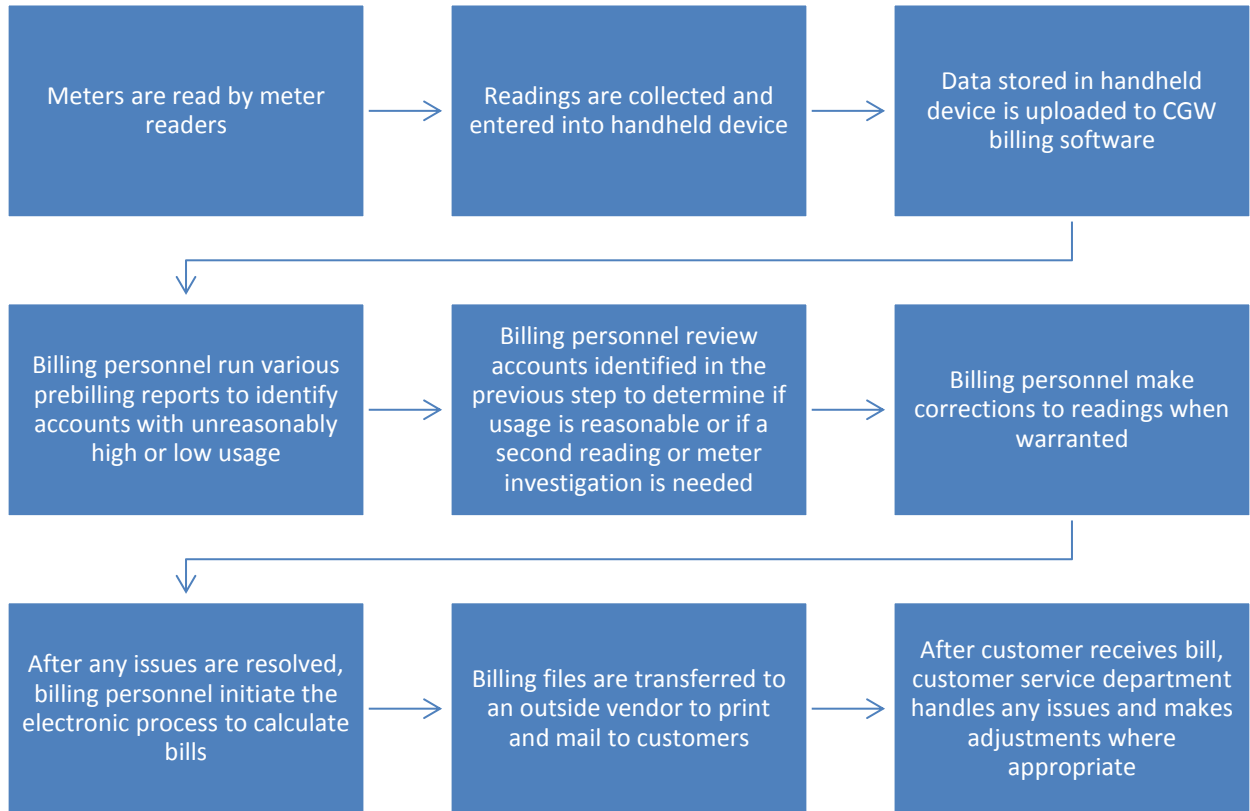
Gas usage is metered and read every 28-30 days by CGW meter readers. Unlike water and sewer services, usage is measured in cubic feet, and each rate is per 100 cubic feet. There is a minimum gas bill based on 300 cubic feet of consumption.

Gas rates are updated monthly and change based on the cost of gas for the particular month. These rate changes are authorized by City Code as a pass through adjustment. Each month, CGW posts new gas rates on their website and updates those rates in the billing software. The rate structure is similar to sewer because the rate per 100 cubic feet decreases slightly as usage increases. This is true for customers both inside and outside the city. The usage levels or tiers at which the rate decreases differ between customer types.

### Process Overview

The billing process is a multistep process that involves many functions within CGW. As noted above, billing accuracy depends on accurate information from those responsible for meter sizing and installation, meter reading, billing calculation, and customer service. Properties and structures are organized by CGW into meter routes. For each route, the billing process occurs once per month. A simplified description of the process is shown in Illustration 2 below.

**Illustration 2**



### Billing Software and Customer Information System

CGW contracts with a company called Systems & Software for use of enQuesta customer information system and billing software. CGW personnel are able to use enQuesta software to store consumption data and meter readings, calculate bills, view payment history, make adjustments, and track work orders performed on each customer account. Additionally, enQuesta stores all pertinent customer information. IT personnel at CGW are responsible for maintaining IT access controls over enQuesta software, as well as assisting end users. Based on CGW's utilization of enQuesta software for various billing and customer information functions, the reliability of information contained therein affects the accuracy of the billing process.

## Statistical Information

Each segment of the billing process services many customers each month. CGW reported that during fiscal year 2015, meter personnel read 320,866 gas meters and 774,517 water meters<sup>1</sup>. Additionally, CGW reported sending 750,438 bills and 142,803 notices to customers<sup>2</sup>. The above statistics are shown in Illustrations 3-5 below. With the volume of meters read and bills processed, it is essential that processes be effective and efficient.

Illustration 3

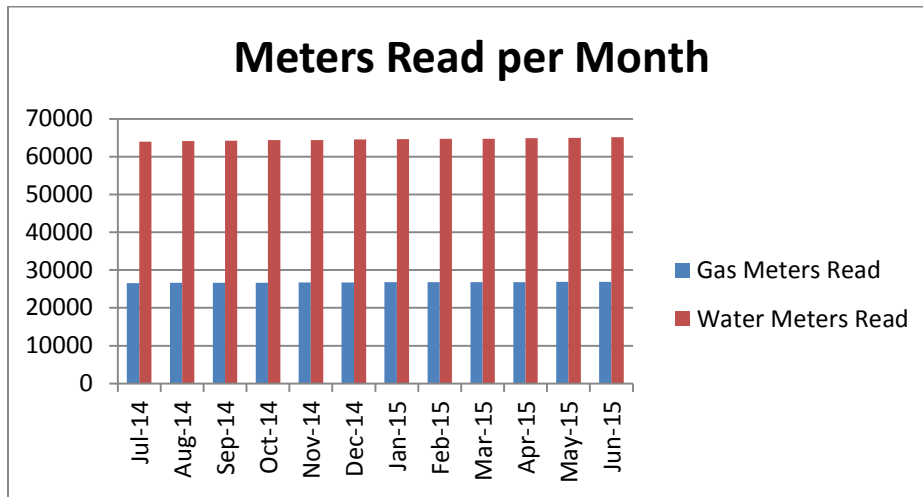
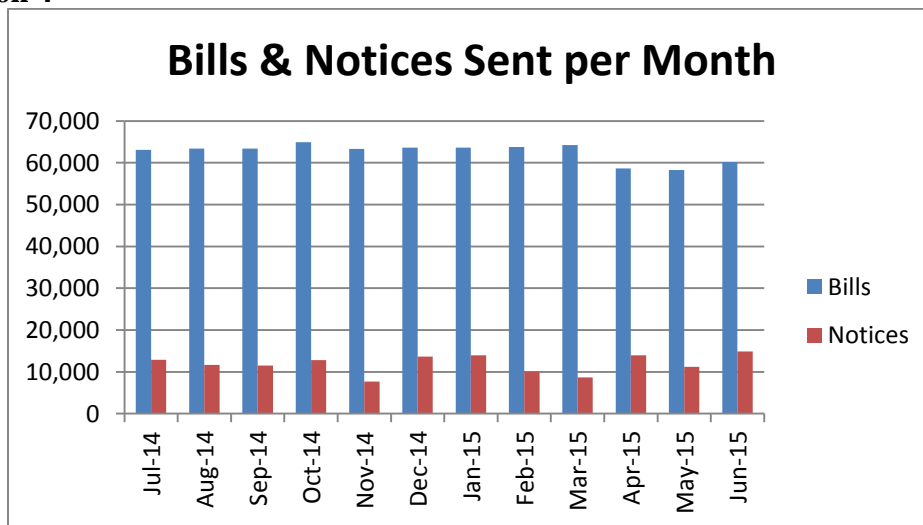


Illustration 4<sup>3</sup>



<sup>1</sup> This information was reported by CGW at the August 27, 2015 meeting of the Gas and Water Committee. It has not been audited or reviewed by the auditor.


<sup>2</sup> Statistics related to bills and notices sent were reported to the auditor by CGW. The auditor has not reviewed or audited the statistics for accuracy. Please note, CGW indicated that bill totals for April through June 2015 do not include any electronic bills sent due to the potential for overstatement related to a new e-bill vendor.

<sup>3</sup> Notices are sent to customers following non-payment of an initial bill.

The successful interaction of all the areas discussed above results in a utility bill, similar to the example below in Illustration 5.

Illustration 5

\*\*DUPLICATE BILL\*\*



2215 MADISON ST  
CLARKSVILLE TN 37043  
Address Service Requested

DATE DUE <b>Apr 23, 2015</b>	TOTAL DUE <b>38.24</b>
PAY AFTER 04/23/2015 <b>42.06</b>	ACCOUNT NO. [REDACTED]

Please ensure that our return address (below) shows through the reply envelope window.

CLARKSVILLE GAS AND WATER  
PO BOX 31329  
CLARKSVILLE TN 37040-0023

[REDACTED]

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**CUSTOMER INFORMATION**

	NAME	ADDRESS
	[REDACTED]	[REDACTED]

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**BILLING STATEMENT**

	BILLING PERIOD	METER LOCATION
	Feb 26, 2015 to Mar 23, 2015	[REDACTED]

Payment will be late after: <b>Apr 23, 2015</b>	<b>Deposit Applied</b>		
	Gas	9695 to 9788 Reading	-50.00
	Water	4399 to 4414 Reading	60.68
	Sewer		8.31
	Debt Coverage		16.22
	Sales Tax		2.24
Late Payment: <b>\$42.06</b>	Total Current		0.79
	<b>Total Balance</b>		<b>38.24</b>

Final Payment  
Date to Avoid  
Deactivation:  
**May 04, 2015**

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**USAGE HISTORY**

	Previous	Type	Usage	Charge
	03.2015	Water	1800 Gallons	-\$ 39.74
Account # [REDACTED]	03.2015	Gas	19700 Cubic Feet	\$ 116.19
	02.2015	Water	2200 Gallons	\$ 11.82
Water meter # [REDACTED]	02.2015	Gas	19300 Cubic Feet	\$ 126.98
	01.2015	Water	1900 Gallons	\$ 10.65
Gas meter # [REDACTED]	01.2015	Gas	14400 Cubic Feet	\$ 98.08


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**IMPORTANT MESSAGE**

Page 1 of 1

BUDGET BILLING! Sign up for budget billing during April, May and June! Visit the Gas and Water website, [www.clarksvillegw.com](http://www.clarksvillegw.com), login to your online account then click on "Budget Billing Sign-Up Form" in the left column to print or call the customer service center, (931) 645-7400, to sign up.

April is National Safe Digging Month! Join us in observing this important event by always calling 811 to reach the Tennessee 811 advance notification service before the onset of any digging project. It's FREE, easy and it's the law! The service marks underground utility lines prior to your



THE CITY OF  
**CLARKSVILLE**  
TENNESSEE'S TOP SPOT

\*\*DUPLICATE BILL\*\*

## Noteworthy Accomplishments

In relation to the stated audit objectives, the auditor identified no exceptions in the areas of customer base completeness, accuracy of transactions recorded from enQuesta billing software to the City's financial records, and accuracy of billing in accordance with approved rates. CGW processes, including communication with the City's Building and Codes department and a second quality review step in recording transactions and rates, contribute to success in these areas.

Based on the fiscal year 2014 financial statement audit, CGW exceeded benchmarks set by the Utilities Management Review Board related to water loss through December of 2020<sup>4</sup>. CGW is currently implementing initiatives which are proactive in addressing water loss, including utilizing pressure zones to analyze consumption trends useful in identifying water loss. This proactive approach will assist CGW in meeting future water loss benchmarks and help identify water loss which has a negative financial effect on CGW and the City of Clarksville.

While further improvements in process efficiencies can be made, the auditor noted that many processes within CGW and utility billing have been designed for high efficiency. For example, water and gas meters are read concurrently and have been set up in handhelds in walking order. These steps save time for meter readers and assist in efficient completion of monthly readings.

## Results of Audit

Auditor testing and research revealed the following findings and recommendations.

### 1. Software Billing Access Not Properly Controlled

#### Criteria:

- In accordance with the Internal Control and Compliance Manual for Tennessee Municipalities issued in 2010<sup>5</sup> (2010 ICCMTM), controls should be in place to ensure only authorized individuals have access to electronic data [Title 5, Chapter 27, Section 2]. This includes appropriate access limitations and procedures to revoke authorization when employment is terminated.
- Access to customers' personal identifying information should be given to employees on a "need to know" basis per the CGW Red Flag Office Procedure policy.
- Per CGW policy, and in accordance with City Code Sections 13-302 and 13-314, the CGW general manager and his written designees including the Customer Service Manager, Assistant Customer Service Manager, Service Center Supervisors, and Lead Customer Service Representatives are authorized to

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<sup>4</sup> Benchmarks set by the UMRB can be found at <http://www.comptroller.tn.gov/umrb/WaterLoss.asp>. CGW's AWWA water audit worksheet can be found in the FY 2014 financial statement audit.

<sup>5</sup> See Other Recommendations, Item (c)

make monetary adjustments to customer accounts, and to waive fees and penalties incurred by customers due to errors made by the department.

**Condition:**

- a) Role assignments within enQuesta software, along with functional capabilities within those assigned roles, do not always appear to be directly related to each employee's position and job functions.
  - One employee was found to have a cash role in enQuesta while cash handling was not related to the employee's job function.
  - Two users were found to have multiple active operator numbers, which could allow a user to input information on one operator number and approve it on the other.
  - Certain roles in enQuesta appear to have access to customer social security numbers, while this information does not appear to be essential in performing job duties for some of those roles.
  - Former employee access to enQuesta was not terminated in a timely manner.
    - Five former employees were found to have active enQuesta user accounts at the time of audit testing.
    - For one employee, enQuesta access was left active for two months following termination before detection by CGW.
- b) Within enQuesta billing software, more users than those expressly authorized by City Code and CGW policy to do so, have the software capability to perform billing adjustments, including leakage adjustments, as defined by City Code.
- c) Employees were found to have the ability to access and edit their own utility accounts. Further testing indicated that the changes made did not appear inappropriate; however, the following instances of account access were noted.
  - Two employees were found to have made changes to their own accounts for testing purposes.
  - Two employee accounts were changed while the user thought they were in enQuesta's training mode.
- d) IT personnel can perform almost all functions in enQuesta without documented oversight.

**Cause:**

- a) CGW reviewed employee role assignments and access permissions in consultation with the enQuesta software vendor during initial set up, however job descriptions and/or responsibilities have likely changed since that time. Re-assessments for appropriateness and necessity were not regularly performed. The control mechanisms for removing access of terminated employees were not consistently implemented to revoke access for all terminated employees on a timely basis.
- b) Software access permissions are generally broader than permissions granted by management policies and procedures. CGW relies on corrective controls such as disciplinary procedures to compensate for the gap, rather than preventive or detective controls.

- c) Software functionality does not allow CGW to limit access to particular accounts, and CGW policy does not restrict use of employee accounts. While enQuesta software does have a training mode, CGW has indicated that work orders must be tested in live mode due to the potential for keying errors in transferring the work order from training to live mode. Therefore, testing in live mode is done on employee accounts because CGW prefers not to test on a customer's account.
- d) The small number of IT personnel may cause difficulty in segregating duties related to system administration.

**Effect:**

The lack of adequate software access controls places CGW's utility billing process at risk for inappropriate editing of billing information, including account adjustments as defined by City Code.

Further, potentially sensitive or confidential information, such as customer social security numbers, is at risk for exposure.

Multiple active operator numbers and/or excessive software access could allow the user to both input and approve a complete transaction without appropriate segregation of duties. One individual having full responsibility for all aspects of a process could result in errors, misappropriations, or irregularities going undetected.

**Recommendation:**

- a) Enhance current policies and procedures related to enQuesta billing software access permissions and role assignments.
  - Review and re-align access permissions for all roles and all employees.
  - Implement a system to review access permissions for employee roles on a rotating basis.
  - Assign only one unique operator number per user.
  - Address necessity of access to any confidential or private information.
  - Develop procedures to ensure that employee terminations or other employee changes require timely enQuesta access revisions. Consider use of a checklist to ensure all necessary steps are completed. Establish deadlines and assign responsibility for monitoring that all steps are completed on a timely basis.
  - Review access permissions annually for any terminated employees who might still have active enQuesta accounts.
- b) For billing adjustment capability, review role functionality concurrently with employee authorizations. Restrict billing adjustment capability in enQuesta to the maximum extent possible to only those with documented authority to do so. Additionally, strengthen the process with other compensating and mitigating controls such as documented review and oversight.
- c) Improve controls surrounding testing and employee account access.
  - Best practices advise that an employee's access to their own account be restricted; however, as CGW has indicated that this is not possible within

enQuesta software, compensating controls should be implemented to mitigate risks of inappropriate actions.

- Develop a written policy prohibiting employee access to their own utility account.
  - As a monitoring step, develop a report to be generated monthly showing all changes by employees to their account and review for inappropriate activity.
  - Work with enQuesta's parent company to develop alternative solutions to testing in a live environment. If testing in a live environment is unavoidable, consider use of a dummy account with appropriate safeguards for testing in the live environment, or if that is not feasible, consider other alternatives for testing purposes.
- d) While IT personnel need access to various enQuesta functions to perform their job duties, there should be compensating controls in place to prevent inappropriate use of that access. Consider alternative compensating controls that could aid in segregating IT duties and access, and in monitoring IT actions.

**Management Comments:** The enQuesta software is in use by multiple utility systems which include Metro Water, Atlanta, San Diego, and Mobile Al. to name a few. The software functionality does not always align with City Code and CGW policy due to the non-proprietary nature of the software. All actions taken while in enQuesta create an audit trail which acts as a deterrent for any inappropriate activity on an account. Management would also point out that the audit did not find any instances of improper or unauthorized adjustments.

Agree \_\_\_\_\_  \_\_\_\_\_

Disagree \_\_\_\_\_

**Corrective Action Plan:**

a) Access roles for all employees have been reviewed and re-aligned to limit access to sensitive customer information after initiation of service. All CSR's have access to customer information during account set-up. The roles will be reviewed annually or upon an employee's change of position. The two users with two access numbers have been corrected. CGW is implementing a checklist for employee change of position or terminations to ensure timely access revisions. b) Online posting for CSR's will be limited. c) The CIS software does not provide the functionality to limit access to specific accounts. A written policy will be implemented concerning employees modifying their own accounts. Further, Supervisors will audit employee accounts annually to detect improper activity. Testing in the Live environment is sometimes required by enQuesta personnel. All testing conducted in the live environment shall continue to be fully documented. d) The enQuesta software logs all users each time they enter the system. An audit trail is created for every action taken in enQuesta. Compensating controls include the daily balancing of accounts by the accounting department with billing records and bank records. Further monitoring will occur during the annual audit of employee accounts (see Item c for details on the annual audit of employee accounts – reference added by internal audit).



**Projected Completion Date: August 31, 2016**

**Responsible Manager: Pat Hickey, Pam Cloud, Brandy Jarrell**

**2. Assigned duties in the billing adjustment process are not properly segregated and existing controls do not ensure accuracy for certain adjustments**

**Criteria:**

- Per the 2010 ICCMTM Title 2, Chapter 1, Section 3, officials should establish an organizational plan that clearly places responsibility for specific activities upon specified individuals.
- In accordance with the 2010 ICCMTM Title 2, Chapter 1, Section 4, duties of employees should be separated so that no one person has control over a complete transaction from beginning to end. Additionally, work flow should be established so that one employee's work is automatically verified by another employee.
- The 2010 ICCMTM Title 5, Chapter 16, Section 4 states that documentation of each billing adjustment is required and should be retained, while all adjustments to customers' bills should be approved by the governing body or its designee.
- Water leakage adjustments should be calculated in accordance with City Code Section 13-314.
- Penalty assessments should be classified consistently and in accordance with existing CGW policies and procedures in leakage adjustment calculations.
- It is best practice to establish and maintain internal controls to provide reasonable assurance that revenues are properly recorded and accounted for to permit reliable financial reports.

**Condition:**

- a) Billing adjustments defined by City Code are performed by supervisors. Such adjustments show no evidence of a documented secondary step for review or approval. As noted in Finding 1, software users other than the authorized supervisors have access capabilities to perform adjustments, an additional reason for documented secondary review.
- b) Of 52 transactions sampled from the Monthly Adjustment Reports for FY 2015, nine adjustments were found to meet the definition of adjustment in City Code Section 3-314. The remaining transactions meet criteria established in a broader definition of adjustment within the billing software. Two of the nine adjustments in which penalties had previously been assessed were misclassified between water, sewer, gas, and applicable taxes. The auditor notes that the customer billing amount in total for each exception was unaffected.
- c) Of 52 transactions sampled from the Monthly Adjustment Report for FY 2015, nine adjustments were found to meet the definition of adjustment in City Code Section 3-314. The remaining transactions meet criteria established in a broader definition of adjustment within the billing software. Two of the nine were found to be calculated using an average usage based on 10 months which is inconsistent with the method outlined in City Code Section 13-314 requiring the use of a 12

month average. Twelve months of usage was available in both instances. The difference in each calculation was minor; however justification for deviation from Code was not documented.

**Cause:**

- a) There is no existing policy or procedure requiring secondary review or approval of adjustments. CGW considers that adjustments performed at the supervisory level should not require independent approval.
- b) Despite training, operator error occurred.
- c) In some cases, 12 months of usage may not be available therefore the calculation may need to be adjusted for the number of months available. However, in the exceptions noted in the condition above, it is uncertain why the 10 month calculation was used. Averages are calculated manually, allowing for error.

**Effect:**

- a) The lack of secondary review and approval in the adjustment process may result in undetected errors in adjustment calculations. Further, this process weakness may allow inappropriate adjustments made by employees to evade detection by CGW management. While the errors discovered during audit sample testing were ultimately immaterial, the control system with current weaknesses may not prevent future errors or inappropriate adjustments.
- b) Inappropriate classification of penalties in the adjustment calculation process results in inconsistent application of CGW policies and possible inaccurate reporting of revenue and sales tax.
- c) Inconsistency in the average usage calculation results in non-compliance with City Code.

**Recommendation:**

- a) Develop and document a policy requiring secondary review and approval of adjustments made to accounts prior to posting. Establish lines of hierarchy and deadlines for review and approval. Assign employees the responsibility to timely review and approve adjustments. Consider the need to make further IT/enQuesta access revisions to support the approval process. This would include segregating duties through enQuesta access permissions, such that a user cannot input and approve an adjustment.
- b) Document and distribute instructions for calculating adjustments and incorporate these instructions into written policies and procedures. Reduce risk of error by designing and implementing input controls into software and/or spreadsheet templates to maintain calculation accuracy and compliance. Consider additional controls related to billing adjustments, such as limiting the dollar amounts and number of transactions for employees making adjustments.
- c) Same as b) above.

In addition to the recommendations specific to the findings above, the following is recommended for process improvement:

- Consider documenting a decision framework for the prebilling correction process to improve consistency, assist in training new staff and provide continuity of business operations.

**Management Comments:**

Agree \_\_\_\_\_ x \_\_\_\_\_

Disagree \_\_\_\_\_

**Corrective Action Plan:** a) enQuesta is incorporating a multi-level adjustment process that will allow secondary approval and implement the recommendations above. b) Adjustments are calculated using an excel template. The multilevel adjustment adds a level of control to input errors.

**Projected Completion Date:** 12/31/2016

**Responsible Manager:** Pam Cloud

**3. Faulty meter undetected by meter investigations; meter replacement and testing goals not met**

**Criteria:**

- The 2010 ICCMTM Title 5, Chapter 16, Section 2 requires that unexplained fluctuations in consumption should be investigated to ensure that users are billed for total consumption and that malfunctioning meters and leaks in lines are located and repaired promptly.
- CGW indicated the following objectives related to meter replacement and meter testing:
  - Replace water meters after 1.5 – 1.75 million gallons of consumption
  - Test larger water meters (1.5 inches and larger) annually
  - Replace gas meters every 10 years

**Condition:**

- a) During the audit, one property was identified as having had a broken water meter since 2013.
- The meter had been investigated through normal CGW processes on five separate occasions (10/21/13, 4/22/14, 9/18/14, 4/23/15, and 10/19/15).
  - The auditor identified this property through an analytical review of consumption data on properties in the Liberty Park subdivision. Following identification of the anomaly in consumption data, the auditor physically observed the property and found various indications that the residence might be occupied.
  - The auditor inquired about the property and the possibility of a meter malfunction on three separate occasions (10/23/15, 10/29/15, and 10/30/15).
  - Following auditor inquiry, CGW performed additional investigations on 10/30/15 before discovering that the meter was not accumulating flow.

- b) Audit results indicated that CGW's verbal meter replacement and meter testing goals were not met as follows:
- Of 46 gas meters tested, 8 smaller meters had been in service more than 10 years.
  - Of 60 water meters tested, two of 47 smaller sized water meters (less than 1.5 inch meter size) were found to be over CGW's target consumption limit for replacement of 1.75 million gallons.
  - Of 60 water meters tested, six of seven water meters (1.5 inch or 2 inch) were not tested during the year in accordance with CGW's objectives.

**Cause:**

- a) In regard to the faulty meter, CGW determined that the leak indicator on the meter was working properly, however the flow was not registering on the index. CGW did not offer an explanation as to why multiple meter investigations did not detect the faulty meter.
- b) In regard to meter replacements and testing:
- Meter replacements for gas and water meters are limited due to limited personnel resources.
  - Gas and water meter replacement policies are not documented. Additionally, existing verbal water meter replacement goals are reactive in nature.
  - Current gas meter replacement objectives for smaller residential meters yield a low number of meters selected for replacement each year. Specifically, ten percent of a limited population of meters is chosen for replacement each year. The limited population of meters that comprises the sample population includes only meters set 10 years earlier and intervals thereof prior. (2006, 1996, 1986, 1976, etc.) The ten percent of meters that are selected for replacement are chosen randomly or with emphasis on older or non-supported meters.
  - The older two inch water meters were not installed with the proper connections to allow field testing. The cost to replace each meter set up is approximately \$4,000 per CGW.

**Effect:**

Ineffective meter investigation procedures may not identify unauthorized consumption, increasing water loss and loss of revenue. If severe, water loss due to unauthorized consumption could negatively impact the AWWA water audit form completed during the yearly financial statement audit. Should the AWWA water audit form not meet specific benchmarks established by the Tennessee Comptroller's Utility Management Review Board (UMRB), the utility may be referred to the Board.

As meters typically lose accuracy over time and flow, ineffective replacement policies for gas and water meters increase the risk that an inaccurate meter may remain in service, causing inaccuracy in the billing process.

**Recommendation:**

- a) The following is recommended related to meter investigations:
- Expand existing meter investigation procedures to include an overall assessment of the property including identifying signs that the property is occupied.
  - Consider increasing the frequency of meter route rotations, as the new perspective of a meter reader unfamiliar with a route may more easily identify unauthorized consumption or other issues.
- b) The following is recommended related to meter replacement and meter testing:
- Consider the need for additional personnel to assist with meter testing and replacements since accurate meters are essential to accurate utility billing.
  - Implement a highly risk based approach for selecting meters for replacement, giving priority to smaller residential gas meters. This approach may include weighting various meter characteristics more heavily in the selection process, including age, condition, consumption data changes, among others.
- c) Develop and document written policies and procedures for meter replacements. In this process consider methods to make the replacement process more proactive and improve accuracies in consumption data used for billing.

**Management Comments:** Clarksville Gas and Water did explain the process used to investigate zero usage work orders. The meter replacement and testing goals are established to provide guidance rather than specific performance. All testable large water and gas meters are tested once each calendar year. It should be noted however that in the past several water meter installations, primarily two inch meters, were not equipped with test ports to enable field testing of the meters. Water meter tests of those meters pulled from service with over 1.5 million gallons of usage show that over 90% of those tested are within 4% of 100% accuracy and 84% are within the industry accepted standard of 2% of 100% accuracy. All large gas meters are tested annually. The unaccounted rate for natural gas has averaged 0.06% over the last five years which indicates the overall measurement of natural gas sales is fairly accurate.

Agree \_\_\_\_\_ x \_\_\_\_\_

Disagree \_\_\_\_\_

**Corrective Action Plan:** a) The meter field test initiated due to zero consumption will be expanded to ensure the index is registering as opposed to the leak indicator on the index turning. This change has been implemented. b) As stated in the report, CGW has just within the last three months purchased a certified water meter test bench and repurposed some positions to create a meter test team to field test large meters, bench test all new water meters to ensure proper operation, and identify suspect meters through an analytical review process. All large commercial and industrial gas meters are tested annually. Unaccounted for natural gas has averaged 0.06% over the past five years which indicates measurement accuracy.

**Projected Completion Date: 10/31/2016**

**Responsible Manager: Krystal Richardson, Eddy Glenn, Ralph Tate**

**4. Errors were noted in certain billing account information and charges**

**Criteria:**

- Utility bills should be calculated accurately in accordance with City Code Title 13, Chapter 3.
- Per the 2010 ICCMTM Title 5, Chapter 16, Section 5, all applicable late payment charges should be recorded.
- Per the 2010 ICCMTM Title 5, Chapter 16, Section 9, if accounts remain unpaid on the municipality's cutoff date, service should be discontinued in accordance with the municipality's policy.
- Per CGW policy, if services are activated after hours and the customer does not call CGW the following day to pay any applicable fees, service will be turned off.
- Per CGW policy, if the utility service amount due is paid by a customer after a work order is generated to turn off service to a property due to non-payment, the customer will be charged a reactivation fee.

**Condition:**

- a) Of 91 accounts tested, the following exceptions were found:
  - Ten showed an inappropriate property location.
  - Three did not receive appropriate sales tax charges.
  - One showed an inaccurate service address.
- b) During analysis of all existing accounts (including current and previous), 175 were identified as having an inside city designation for one utility service (e.g. water), and an outside city designation for another (e.g. sewer). While this is not a large number in comparison to the total number of accounts, the test result indicates that inconsistency exists.
- c) Of 20 tested accounts receiving an after-hours activation, two appear to have deviated from CGW policy.
  - One account was erroneously not included on the turn off list following non-payment of applicable fees. This was discovered by existing CGW procedures at month end.
  - One account was erroneously not charged a \$50 water reactivation fee.

**Cause:**

- a) Input error occurred, and current procedures did not detect those errors.
- b) Current controls were not designed to reconcile designations between utility services.
- c) Despite training, error occurred.

**Effect:**

- a) Inaccurate locations could result in incorrect billing rates and/or sales tax calculations.

- b) Inconsistent location designations among utility services increase risk that rates will be inconsistently applied.
- c) Noncompliance with cutoff and reactivation fee policies could result in loss of revenue.

**Recommendation:**

- a) Assess current procedures to identify potential weaknesses in account set up and customer service areas. Consider additional controls that could be implemented to prevent or detect future errors in those areas.
- b) Formalize the reporting process to outline reports needed for monitoring purposes. The formal report process should designate individuals responsible for production and review of necessary reports, as well as time frames for generating those reports. Consider using data analysis techniques to identify anomalies in account information or billing calculations regularly. Consider modifying customer bills to show calculations of bill amounts, including whether inside or outside city rates are applied.
- c) Develop comprehensive written procedures in all areas that employees can use as a reference while performing job duties. This reference, when used by employees, may help prevent future mistakes or errors from occurring.

**Management Comments:**

Agree \_\_\_\_\_ x \_\_\_\_\_

Disagree \_\_\_\_\_

**Corrective Action Plan:** a) Account set up for new properties is based on approved Plats from the Regional Planning Commission. b) A Cognos report is now being run each week which identifies any inconsistencies related to service location. c) Training manuals are available for functions in enQuesta. Further enQuesta incorporates an online project assistance which employees can access from within enQuesta.

**Projected Completion Date:** Completed

**Responsible Manager:** Christy Monson

**5. Usage for Woodlawn satellite accounts not consistently deducted as required**

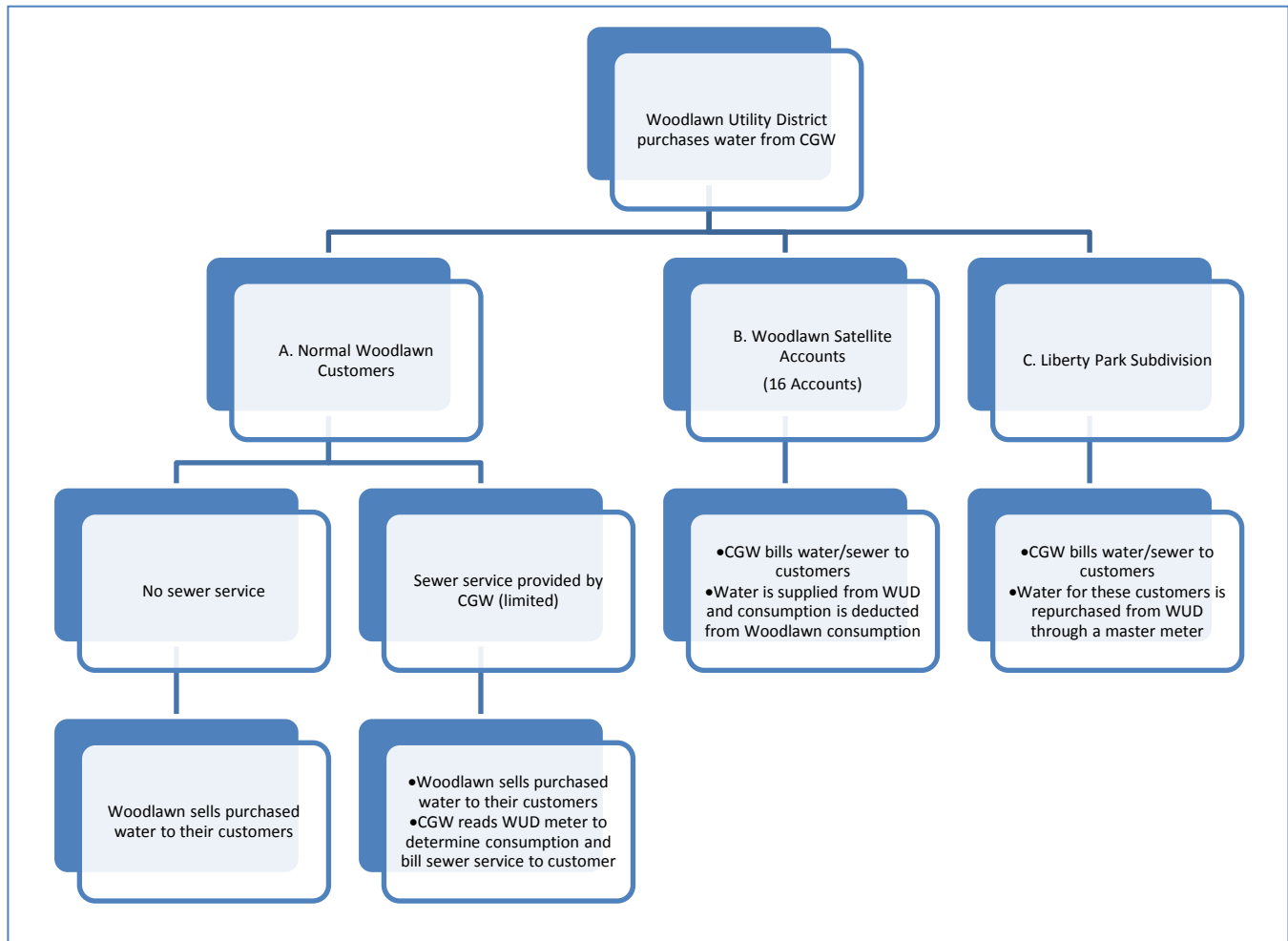
**Criteria:**

Bills should be calculated correctly in accordance with City Code Title 13, Chapter 3.

**Condition:**

To better understand the condition and recommendations to follow, Illustration 6 is provided to explain three separate billing arrangements that exist for customers living within the Woodlawn Utility District (WUD). The three arrangements were reached over a period of years as the Woodlawn area developed. Residents within close proximity are billed differently, while in accordance with the respective billing arrangement for their location.

## Illustration 6



In the period tested, there were 16 Woodlawn satellite accounts per the billing software whose usage should be deducted each month from WUD’s overall consumption in order to calculate WUD’s billing correctly (Illustration 6, column B). However during audit testing, the auditor identified three satellite accounts where usage was not being appropriately deducted from WUD’s consumption, resulting in overcharge to WUD.

### Cause:

Input error in account setup may be the initial cause, and monitoring of the few number of satellite accounts did not detect the error.

### Effect:

When usage for Woodlawn satellite accounts is not properly deducted from WUD’s total usage, WUD is overcharged for their monthly water purchase.

### Recommendation:

Implement a policy to regularly reconcile the usage on satellite accounts with the usage deducted from the WUD account.



In addition to the recommendation above, the following is recommended for improvement:

- In one agreement affecting the Liberty Park subdivision (column C of Illustration 6), CGW sells water to WUD and then buys back from WUD at a higher rate to sell to the customer. We recommend that the Woodlawn area billing arrangements be revisited in effort to bring more uniformity and efficiency to the billing process, and evaluate whether a more favorable collective arrangement can be negotiated for Woodlawn customers and the city.

**Management Comments:** Clarksville Gas and Water has been working with Woodlawn Utility District to implement a new contract between the entities. Clarksville's main concern is that CGW has no ability to disconnect sewer service in the event a Woodlawn customer pays the water portion of the bill without paying the sewer portion. We are and have been attempting to resolve that issue with Woodlawn for several years. No new customers are being connected to the sewer system while the issue is being resolved. That is not a concern for customers in the Liberty Park subdivision as CGW provides both water and sewer service.

Agree \_\_\_\_\_ x \_\_\_\_\_

Disagree \_\_\_\_\_

**Corrective Action Plan:** Three satellite accounts did not transfer properly through the bump up process which resulted in the water usage from each of the three accounts not properly deducting from the Woodlawn bill. The process is automated and internal to the enQuesta system. The issue has been resolved by enQuesta. Negotiations with Woodlawn have been ongoing for several years.

**Projected Completion Date:** Completed

**Responsible Manager:** Pam Cloud

## **Other Recommendations**

The auditor has developed the following recommendations which are not related to specific weaknesses in the process or non-compliance. Rather, they are suggestions to enhance the utility billing process:

- a) Information technology (IT) is an important infrastructure for internal control. For IT-related vendor contracts and other IT-related discussions, we recommend city-wide collaboration in determining the most cost efficient risk management strategies to:
  - comply with various data security regulations
  - protect customer data
  - improve customer service, and
  - reduce financial and reputational risk.
- b) Accurate data is essential for effective monitoring of processes. The basis for gas meter set and install dates entered into enQuesta was noted during the audit to

- be inconsistent. Variation potentially causes meter data analysis to be misleading. Consider defining appropriate criteria for input of set and install dates. Once established, communicate to applicable employees.
- c) In December 2015, after the audit period under review, the State of Tennessee Division of Local Government Audit released a revised edition of the Internal Control and Compliance Manual applicable to governmental entities. The 2015 manual is principles-based, whereas the 2010 ICCMTM provides more detailed discussion and examples of risks and internal control. Criteria included in this audit report include references to the 2010 ICCMTM which at the time of this report is still available for reference and is considered a source of best practices. We recommend that CGW review the revised manual and document compliance with the three categories of objectives and five components of internal control framework in all areas, including utility billing. Generally, we recommend the following related to operations, financial reporting, and compliance in accordance with the new manual:
- Strengthen the overall control environment.
  - Perform a documented risk assessment of the utility billing process.
  - Design control activities to address risks identified in this audit and other identified risks. Implement compensating and mitigating controls where necessary.
  - Improve lines of communication and information flow by enhancing policies and procedures.
  - Monitor the effectiveness and efficiency of existing control activities on a periodic basis.
- d) Management should ensure employees have the knowledge and resources to complete tasks associated with utility billing consistently and correctly, focusing on the areas of adjustment calculations, meter investigations, account set up, and after-hours activation. Consider enhancing training or alternative methods to implement this recommendation in the most efficient and effective way possible.

**Management Comments:** CGW works within the city wide IT framework for most IT infrastructure common to all. However, there are many areas where the needs and requirements of CGW are unique and differ from other city departments, such as our customer information system. We will continue to collaborate city wide whenever possible. The meter install date and the meter set date are internal entries by the enQuesta software, not data entered by CSR's. Management disagrees with item b. The criteria is defined within the software. The dates are not input by CSR's. The gas meter install date is the date entered by enQuesta when a meter installation work order is completed. Gas meter set date is the date entered by enQuesta that the device was originally set in place (if available). CGW is reviewing the 2015 Control and Compliance Manual and has just completed the required Internal Control Plan. Employees receive both internal and external training, to include third party certifications where available, to ensure the required knowledge is attained to efficiently perform their tasks. The resources available for training in the enQuesta system include both comprehensive training manuals and an online process assistance module which is accessible from any screen.

Agree Items a, c, & d

Disagree Item b

**Corrective Action Plan:** Management will implement changes as necessary, as discussed in comments above.

**Projected Completion Date:** N/A

**Responsible Manager:** N/A

## **Conclusion**

Our audit of Clarksville Gas and Water's utility billing process from July 1, 2014 to June 30, 2015 yielded the following results related to the original audit objectives.

The first audit objective was related to accuracy of the billing calculation in accordance with approved rates. Audit testing revealed that rates were properly entered into billing software without exception.

Regarding the completeness of the customer base, audit testing did not indicate significant weaknesses in this area.

The design and operation of internal controls related to utility billing resulted in certain identified weaknesses in areas of meter replacement and investigations, oversight of account set up, and segregation of duties surrounding billing adjustments.

- Billing adjustments performed by supervisors show no evidence of a documented secondary step of review or approval.
- Some adjustments were found to be calculated or classified inconsistently.
- CGW meter investigation procedures were performed multiple times, but failed to detect a broken water meter for one property identified by the auditor.
- The gas meter replacement policy for smaller residential meters does not facilitate timely and necessary replacements.
- Fourteen exceptions were noted within 91 accounts tested as having one or some combination of the following errors: customer location misclassification, missing meter fees/sales tax, and/or incorrect service address.
- Several accounts were identified as having inconsistent locations for the different services provided (i.e. water, sewer, and gas).
- Three Woodlawn satellite accounts were not appropriately deducted from Woodlawn Utility District's usage.

Additionally, billing software access controls were noted as lacking in the following ways.

- Role assignments, along with functional capabilities within those roles, are not always matched to employee job function.

- Two employees were found to have multiple active operator numbers.
- Employee access is not always removed timely following employee termination.
- More employees than those expressly authorized to do so have the software capability to perform billing adjustments.
- Employees with certain billing software permissions have the ability to access and edit their own utility accounts.
- IT personnel have broad access to billing software functions without documented oversight.

CGW's processes for safeguarding proprietary information related to utility billing generally seem adequate with the exception of certain customer information. Employee access to customer information, including social security number, is not currently restricted to those who require the information to perform essential job functions.

In regard to compliance with applicable laws and policies, testing revealed that there are instances where CGW is non-compliant with their internal policies and objectives, notably in the areas of meter testing and replacement, billing adjustment calculation, and after-hours activations. Further, certain weak areas in the internal control system have created situations where customers are not always billed in accordance with City Code.

When testing the accuracy of recording billing transactions in the City's financial records, audit procedures did not reveal any exceptions; however, the recorded transactions could be affected by other findings in this report.

Based on the audit results summarized above, we have made various recommendations for improvement which are detailed in the report. Recommendations include, but are not limited to, the following:

- Align internal control documentation to all five components of internal control outlined in the December 2015 Tennessee Internal Control and Compliance Manual. The five components are control environment, risk assessment, control activities, information and communication, and monitoring.
- Strengthen access controls surrounding enQuesta billing software.
- Implement appropriate segregation of duties and a documented secondary review step related to billing adjustments.
- Develop comprehensive written policies and procedures.
- Formalize the reporting process to outline reports needed for effective monitoring.
- Evaluate and enhance existing procedures in areas of meter investigation, meter replacement, and account set up.

The auditor would like to thank the staff of Clarksville Gas and Water for their help and support during the performance of this audit. Their positive attitude facilitated the conduct of the audit and provides the necessary environment for process improvements to take place.

**If further information about this audit is desired please contact Internal Audit at 931-648-6106.**