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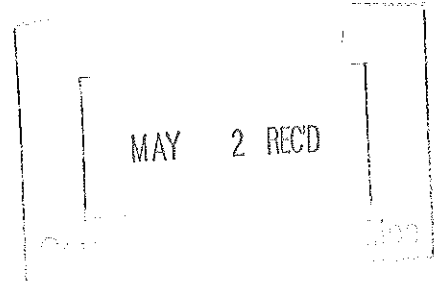
MAY 02 2013

COUNTY COUNCIL

**ANNE ARUNDEL COUNTY  
OFFICE OF THE COUNTY AUDITOR**

May 2, 2013

The Honorable Members of the County Council  
The Honorable County Executive Laura Neuman  
Mr. Ronald Bowen, Director, Department of Public Works  
Anne Arundel County, Maryland  
44 Calvert Street  
Annapolis, Maryland 21401



Dear Members, Ms. Neuman, and Mr. Bowen:

Section 13-5-806 provides that the charge for customers with unmetered wastewater shall be "the average charge for wastewater service for similar properties plus a maintenance charge of \$3 per billing cycle regardless of the amount of usage." The term "similar properties" is not defined.

In practice DPW determines the average charge for similar properties based on the number of equivalent dwelling units (EDU's) the Director of Public Works has assigned to a property multiplied by 24,000 gallons/quarter. The Director has assigned one EDU to a single family attached or detached dwelling; consequently, the charge for a single family home with unmetered wastewater is based on 24,000 gallons/quarter.

DPW advised us that they have used 24,000 gallons/quarter/EDU for at least 15 years. Further, Ronald Bowen, Director of Public Works, asserts that this average is consistent with data and practices from surrounding jurisdictions. Mr. Bowen advised us that the Washington Suburban Sanitary Commission (WSSC) states average consumption is 70 gallons/day/person, which would be 25,200 gallons/quarter for a family of four, and Howard County uses 22,600 gallons/quarter for the purposes of billing unmetered wastewater.

*Analysis of Metered Water Consumption in Anne Arundel County*

Councilman Trumbauer asked us to determine whether management's practice of billing for unmetered wastewater based on 24,000 gallons/quarter/EDU was reasonable. Accordingly, we asked management to generate reports from the County's billing system of metered water consumption by residential customers who have individual meters. We excluded condominiums, apartments, and multifamily dwellings that have a master meter, and we excluded all nonresidential accounts.

We analyzed the "Summary Reports" provided to us by management and applied procedures to determine whether the reports were complete and accurately captured consumption by residential customers with individual meters. Specifically:

- We tested the mathematical accuracy of the Summary Reports.
- We obtained the detailed data that supports information in the Summary Reports for 2011 and 2012, and we reconciled the total number of accounts and total usage from the detailed data to the Summary Reports.
- We used the detailed data to recalculate the average quarterly consumption by account classification shown on the Summary Reports. (Residential accounts with individual meters are

classified as Piney Orchard or non-Piney Orchard and by meter size.)

- We selected 75 accounts (50 accounts from 2012 and 25 from 2011), and we:
  - agreed the usage and amounts billed from the detailed data to the 296 individual bills for the accounts.
  - ensured all individual bills for each account were included in the detailed data.
  - recalculated total usage for each of the 296 individual bills based on prior and current meter readings.
  - recalculated the average usage for each account and agreed the calculations to the detailed data.
- We selected a sample of 15 single family dwellings and ensured the detailed data appropriately included the dwellings if they had metered water and properly excluded the dwelling if they did not.

We found no exceptions in our testwork; therefore, we conclude that the Summary Reports of average consumption generated by management and the detailed data from which the Summary Reports were compiled are complete and accurate. The Summary Reports show average water consumption for residential customers with individual meters was:

Calendar Year	Average Consumption for Residential Customers with Individual Meters for Water
2008	15,950 gallons/quarter
2009	15,040 gallons/quarter
2010	15,740 gallons/quarter
2011	14,910 gallons/quarter
2012	15,170 gallons/quarter
<b>Cumulative five-year average</b>	<b>15,360 gallons/quarter</b>

To determine whether there was any unusual data that would skew the average consumption shown in the Summary Reports, we analyzed the 2012 detailed data to identify "outliers" and potential errors. In our analysis:

- We noted a number of accounts that showed zero consumption. This was consistent with our expectation of housing vacancies due to the economic recession.
- We noted a number of bills with unusually high quarterly consumption that exceeds 500,000 gallons. We investigated these bills further and determined many were not paid in full, likely because the charges are in dispute, or the customers ultimately received credits against some or all of the bill.
- Our review of customer account names showed that the vast majority of account holders appear to be individuals or trustees who hold title to single family homes. However, we did note some account names that did not appear to be individuals. We investigated these accounts and determined that some appear to be improperly classified as residential accounts, including some condominiums and apartments, bank branches, a post office branch, a restaurant, a volunteer fire company, and homeowners' association common areas.

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Because accounts with no consumption, unusually high consumption, or accounts that may be improperly classified could skew the average consumption shown in the Summary Reports, we recalculated the average consumption for 2012 *excluding* these accounts where appropriate, and the average quarterly consumption we recalculated was 15,600 gallons/quarter.

We further analyzed the Summary Reports by meter size. Our analysis showed that 87% of the residential accounts have a 5/8" meter, and 12% are single family homes with larger meters to accommodate fire suppression sprinkler systems. The average consumption for these customers, which represent 99% of all residential customers with individual meters, was:

Calendar Year	Average Consumption 5/8" meter	Average Consumption Larger Meter to Accommodate Sprinkler System
2008	16,410 gallons/quarter	11,200 gallons/quarter
2009	15,430 gallons/quarter	10,860 gallons/quarter
2010	16,180 gallons/quarter	11,310 gallons/quarter
2011	15,310 gallons/quarter	11,070 gallons/quarter
2012	15,550 gallons/quarter	11,220 gallons/quarter
<b>Cumulative five-year average</b>	<b>15,780 gallons/quarter</b>	<b>11,130 gallons/quarter</b>

To evaluate further whether 24,000 gallons/quarter reasonably represents average consumption for a single family dwelling, we considered Mr. Bowen's assertion that the County's practice is consistent with WSSC's stated average consumption of 70 gallons/person/day. U.S. census data for 2007 - 2011 shows that the average household in Anne Arundel County is 2.61 people. Applying consumption of 70 gallons/person/day to an average household of 2.61 people yields 16,500 gallons/quarter.

Finally, we considered the provisions of the County Code governing the allocation of water and wastewater capacity. Under the requirements of § 13-5-804 of the County Code, the Director of Public Works is required to assign EDU's to a property for the purposes of allocating water and wastewater capacity based on peak daily usage. One EDU is defined as 250 gallons, which equates to 22,500 gallons/quarter. Therefore, the Director has determined that peak consumption for a single family home is less than the average consumption on which DPW bills for unmetered wastewater.

We also noted that § 13-5-804(b) provides that if the Director finds that new technology or unique circumstances may affect the determined peak daily usage, the Director may enter into an agreement with the property owner to recalculate the EDU's based on the average daily usage during the highest actual usage billing cycle times a peaking factor of 1.4. If this peaking factor is applied to 250 gallons/EDU, average daily usage during the highest actual usage billing cycle would be 179 gallons/day, or 16,110 gallons/quarter.

**Conclusions**

By every available measure, the average charge for wastewater service for single family homes with metered wastewater is significantly less than the 24,000 gallons on which DPW bases the charge for single family

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homes with unmetered wastewater.

- Average quarterly consumption for the last five years for all residential accounts with individual meters was 15,360 gallons.
- Average quarterly consumption for the last five years for all residential accounts with individual meters adjusted to exclude accounts with no consumption, unusually high consumption, or those that may be improperly classified was 15,600 gallons.
- Average quarterly consumption for residential accounts with 5/8" meters for the last five years was 15,780 gallons, and for those with larger meters to accommodate fire suppression sprinkler systems, average quarterly consumption was 11,130 gallons.
- Applying a rate of 70 gallons/day/person to the average household size of 2.61 people per U.S. census data yields average quarterly consumption of 16,500 gallons/quarter.
- The Director of Public Works has determined that peak daily usage for a single family home is 22,500 gallons/quarter. Logically peak usage should be greater than average usage, and if peak usage is 1.4 times average usage, then one EDU would yield average consumption of 16,110 gallons/quarter.

### *Recommendations*

We recommend that DPW establish a policy that defines "similar properties" for the purpose of § 13-5-806, considering the type of unit (single-family home, town home, condominium, etc.), the use (residential vs. nonresidential), and other factors that may be relevant. After defining "similar properties" for each type of customer, DPW should ensure that the County's billing system is capable of generating reports that will show average consumption for "similar properties" with metered wastewater and base the charge for those with unmetered wastewater accordingly.

Until DPW is able to define "similar properties" and gather the data needed to calculate average consumption, we recommend that DPW base wastewater charges for properties with unmetered wastewater on one EDU of 16,000 gallons/quarter, consistent with the average consumptions detailed in our conclusions above.

### *Effect on Wastewater Rates*

Currently the rate for metered wastewater is \$4.71 per 1,000 gallons. If DPW decreases the average consumption on which it bases the unmetered wastewater charge from 24,000 gallons/quarter/EDU to 16,000 gallons/quarter/EDU, the charge for a single family home would decrease approximately \$48/quarter, comprising \$38/quarter for wastewater and \$10/quarter for the environmental protection fee.

If the amount paid by unmetered wastewater customers decreases because the consumption on which it is based decreases, then the rate/gallon paid by all customers (metered and unmetered) would have to increase to ensure Utility Fund revenues are stable. We are unable to determine the rate increase that would be necessary because we have not yet been able to obtain the reports necessary to calculate the impact; however, the majority of the County's wastewater customers have metered wastewater, so we can conclude that metered wastewater customers are paying too little, and unmetered wastewater customers are paying significantly too much.

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*Managements' Response*

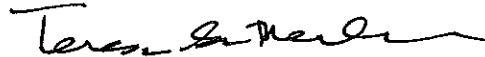
*The Administration has reviewed additional data and agrees that 16,000 gallons per quarter is a reasonable average usage for residential property owners in Anne Arundel County that currently receive public sewer services but do not have public water. This data review also validates previous data submitted by the Administration to the Auditor and used in the preparation of the audit report. The Administration notes that the current long-standing practice of using 24,000 gallons is not dissimilar from other local jurisdictions. The Washington Suburban Sanitary Commission (WSSC), which serves Prince George's County and Montgomery County, states that the average consumption per day per individual is 70 gallons. That would translate to 25,200 gallons per quarter for a family of 4. Howard County charges unmetered customers based on 22,600 gallons per quarter.*

*Nonetheless effective July 1, 2013, DPW will lower the basis for average water usage to 16,000 gallons per quarter. In the context of existing fund balance, and the rate increase proposed in the FY14 budget, any action with respect to rate adjustments related to this change in basis will be addressed in a future rate study. DPW will also develop a policy by July 1, 2013 to define what constitutes similar properties in compliance with the Code (13-5-806) to be either residential or nonresidential. The Auditor recommended that this definition should consider "the type of unit..., the use..., and other factors that may be relevant." However, DPW does not support breaking down the residential category further to include the specific type of residential unit in that DPW has found that water usage varies on several factors (including the number of people living in a structure, regardless of the structure's size).*

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We thank the staff in DPW, the Office of Finance, and OIT, particularly Christine Romans, Leslie Campbell, Michael Beard, and Allegera Wynn. Please call if you have any questions regarding our findings and recommendations.

Sincerely,



Teresa Sutherland, CPA  
County Auditor