Determining Charges for Equivalent Meter Sizes

By Jonathan Fowler, P.E., Engineering Division, Public Service Commission of West Virginia

We have all seen how most water tariffs and some sewer tariffs are set up to require a certain minimum payment, which varies with the size of the water meter serving the customer. But, have you ever wondered how those minimum charges were established or what they are based upon? These charges are typically based on a concept known as the “equivalent meter size” and I’ll try to explain it in this article.

Water meters and services are sized to provide adequate service at an acceptable loss of pressure when operating at the design flow rate for the particular customer they are intended to serve. While I won’t go into the details of meter and service design and sizing, it will be sufficient for this discussion to assume that the water utility, either by using water service sizing guidelines, such as the American Water Works Association (AWWA) technical manuals, or by using accepted and proven installation sizes (based on past experience), is presumed to have installed a meter and service that is the proper size and type. For instance, nearly all residential services are served through either a 5/8-inch or 3/4-inch (trade size) positive displacement type meter. These are usually installed without the need for a detailed analysis. We simply know – based on experience – that these size meters will work satisfactorily in 99% of residential installations. So, now that we have the meter size, how do we figure the “equivalent meter size,” and thus establish the minimum charge for a particular size of meter?
The concept of equivalent meters is used in several areas of water utility practice, including the establishment of minimum charges and in the preparation of one of the factors that is used in class cost of service studies. But just what is a meter equivalent? Simply put, the meter equivalents are the theoretical number of standard 5/8-inch meters that would be required to provide the same maximum continuous flow rate as the size meter you are considering. This is based upon the rating tables developed by AWWA and published in its various Standards for Water Meters (C-700, C-701, C-702, and similar meter standards).

A standard 5/8-inch meter has a rated maximum continuous flow of 10 gallons per minute (gpm), based on AWWA Standard C-700. This is the baseline used for calculating equivalent meter sizes and is assigned a meter equivalent of 1.00.

The most common factors used by PSC staff when calculating equivalent meter sizes – and minimum bills – are presented in the following table, which is based upon the particular AWWA Standards noted.

<table>
<thead>
<tr>
<th>Meter Size &amp; Type</th>
<th>Factor</th>
<th>Referenced Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; Standard P.D.</td>
<td>1.00</td>
<td>AWWA C-700-02</td>
</tr>
<tr>
<td>3/4&quot; Standard P.D.</td>
<td>1.50</td>
<td>AWWA C-700-02</td>
</tr>
<tr>
<td>1&quot; Standard P.D.</td>
<td>2.50</td>
<td>AWWA C-700-02</td>
</tr>
<tr>
<td>1½&quot; Standard P.D.</td>
<td>5.00</td>
<td>AWWA C-700-02</td>
</tr>
<tr>
<td>2&quot; Compound</td>
<td>8.00</td>
<td>AWWA C-702-92</td>
</tr>
<tr>
<td>Turbine</td>
<td>10.00</td>
<td>AWWA C-701-02, Class II, High-Velocity</td>
</tr>
<tr>
<td>3&quot; Compound</td>
<td>16.00</td>
<td>AWWA C-702-92</td>
</tr>
<tr>
<td>Turbine</td>
<td>24.00</td>
<td>AWWA C-701-02, Class II, High-Velocity</td>
</tr>
<tr>
<td>4&quot; Compound</td>
<td>25.00</td>
<td>AWWA C-702-92</td>
</tr>
<tr>
<td>Turbine</td>
<td>42.00</td>
<td>AWWA C-701-02, Class II, High-Velocity</td>
</tr>
<tr>
<td>6&quot; Compound</td>
<td>50.00</td>
<td>AWWA C-702-92</td>
</tr>
<tr>
<td>Turbine</td>
<td>92.00</td>
<td>AWWA C-701-02, Class II, High-Velocity</td>
</tr>
</tbody>
</table>

To use this table, find the size and type of meter (positive displacement, turbine, combination, etc.) you are using and apply the equivalency factor listed. For instance, a 2-inch compound meter has a factor of 8.0, so your minimum charge for that size meter is 8.0 times the minimum charge for a 5/8-inch meter, which has an assigned equivalency factor of 1.0.

One word of caution, particularly when dealing with older, less-common meters such as turbines, there may be more than one class of meter with each class having different maximum continuous flow ratings, and thus more than one equivalency factor, for a given size meter. If you run into this situation, give us a call and we’ll help you figure it out.
What You Need to Know about Flood Mitigation Preparedness
By Jeremy C. Wolfe, Loss Control Manager, West Virginia Board of Risk & Insurance Management

Excessive rain, a ruptured dam or levee, and excessive ice melting are all examples of ways in which a waterway can be overwhelmed and produce a flooding event. Some floods can take hours or even days to mature, allowing ample time to prepare and evacuate. Others can advance quickly and with little warning, allowing little or no time to prepare and evacuate.

There are mitigation approaches entities can take to minimize the impacts resulting from flooding events. Thoughtful planning for flooding events that may put an entity at risk can pay large dividends when these events occur; thereby reducing bodily injury, property damage, business disruption, and associated insurable losses.

Below are some strategies an entity can take prior to a flooding event to safeguard its properties and individuals for which it is responsible:

- Identify and have knowledge of whether facilities under your supervision are located in a flood plain, the history of flooding in such areas, and the elevation of facilities in relation to streams, rivers, and dams.
- Identify and have knowledge of local community emergency plans, warning signals, evacuation routes, and location of emergency shelters.
- Communicate with local emergency management officials regarding special need populations under your organization’s supervision to ensure effective emergency evacuation plans are practiced and maintained for use if needed.
- Routinely monitor a National Weather Service radio (NOAA Weather Radio) and established procedures for facility shutdown and early release of associated personnel/individuals.
- Identify and have knowledge of where and how to shut off critical facility utilities, including, but not limited to, electric power, gas, water, hydraulics, compressed air, sewer systems, etc.
- Move as much property and equipment as possible to higher elevation/ground for storage. Property of high value should be a priority.
- Move all vehicles and/or mobile equipment to higher elevation/ground.
- Construct flood barriers with sandbags or other materials.
- De-energize all electrical system components and ensure that all switches, sockets, circuit breakers, wiring, and associated equipment is at least 12 inches above the facility’s projected flood elevation.
- Shut down all fuel burning equipment that is subject to flooding.
- Identify and secure potential facility hazards prior to a flooding event.
- Ensure routine inspection/cleaning out of facilities associated drainage systems, including, but not limited to, culverts, gutters, downspouts, and associated piping.
• Provide access to and/or installation of sump pumps at identified facilities for damage mitigation in the event of a heavy rain or flooding.

• Provide access to and/or installation of backflow valves or plugs at identified facilities for damage mitigation in the event of a heavy rain or flooding.

Additional information related to severe weather mitigation preparedness can be accessed at the West Virginia Board of Risk and Insurance Management website: www.brim.wv.gov.

West Virginia CWSRF Program Status

By Katheryn Emery, P.E., CWSRF Program Manager, West Virginia Department of Environmental Protection

It’s that time of year again. The 2016 state fiscal year is behind us and we have issued our FY 2017 Intended Use Plan (IUP). There have been several changes since last year and I want to cover some of those as well as the status of funds within the Clean Water State Revolving Loan Fund (CWSRF).

This year’s capitalization grant from EPA is $20,829,000 and the state match is $4,165,000. The CWSRF will also allocate an additional $4,165,800 in principal forgiveness and the program is still required to fund green projects. As always, our funds are issued on a first come, first served basis, and a binding commitment for funds will not be issued until the project is within six months of construction and has an approved facility plan and plans and specifications.

The major change in this year’s IUP is the adjustment of the loan terms. The effective rate for the FY 2017 loans is the same as last year; however, the IUP discusses the increase in the interest rate on FY 2018 loans and moving to 3,400 gallons for determining project financing terms. The only projects that will be grandfathered in under the FY 2017 terms are those that have a binding commitment of funds from the CWSRF and have filed with the Public Service Commission or received rate approval from their County Commission (whichever is required) by June 30, 2017.

We are still offering funds under the Agricultural Water Quality Loan Program and the Onsite Systems Loan Program. Reserves of $150,000 and $300,000, respectively, have been set aside for both of these programs. The primary changes to the IUP have been included in this article, but there are other changes that may be of interest to you. I encourage you to read our 2017 IUP, which can be found on the DEP’s website at http://www.dep.wv.gov/WWE/Programs/SRF/Pages/default.aspx.

As always, feel free to contact me or any other employee of the CWSRF program with any questions. You can reach us at 304-926-0440.
How to Prorate Water Bills

By Versie Hill, Utilities Analyst III, Public Service Commission of West Virginia, Water and Wastewater Division

There are circumstances where customers are rendered bills outside of a normal billing period and, based on Public Service Commission Rules, the bills are eligible to be prorated.

The Commission's Rules for the Government of Water Utilities, Rule 4.3.b. states: “First and last bills, monthly or quarterly, for water service rendered for periods of five (5) days more or five (5) days less than the normal billing period will be computed in accordance with the rate applicable to that service, by the amount of water blocks, and the minimum charge as set forth in that rate will be prorated on the basis of the number of days in the period in question, to the total number of days in the normal period.”

The Commission's Rules for the Government of Sewer Utilities, Rule 4.3.b. has similar language.

Normally, the first bill represents a new customer’s first time being billed and the last bill represents closure of a customer’s account. There may be other circumstances where customer bills are eligible to be prorated. Customers who suspend their service for a portion of time (without account closure) and then return to the system may be eligible for prorated bills. These customers are often referred to as seasonal customers. Questions then arise as to what a normal billing period is and what method is used in computing a prorated bill.

What is a normal billing period? Assuming a 30 day billing cycle and applying Commission Rule 4.3.b., this basically means any bills rendered for a service period of 26 days (four days less) to 34 days (four days more) is referred to as a normal bill.

What method is used in prorating a bill? The customer’s usage for the period of time in question would remain unchanged. The utility’s tariff blocks as well as the monthly minimum bill would be prorated based on the ratio of service period to normal billing period. The prorated tariff blocks would then be used to compute the billing amount for the usage of the service period in question.

Calculation Example #1:

If a customer was on the system for 10 days out of 30, each individual tariff block would be reduced to 33.3% (10 ÷ 30).

Assuming existing tariff of:

<table>
<thead>
<tr>
<th>Gallons Used</th>
<th>Tariff per 1,000 gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 3,000 gallons</td>
<td>$10.00</td>
</tr>
<tr>
<td>Next 6,000 gallons</td>
<td>$8.00</td>
</tr>
<tr>
<td>All over 9,000 gallons</td>
<td>$6.00</td>
</tr>
<tr>
<td>Minimum bill</td>
<td>$30.00 for 3,000 gallons</td>
</tr>
</tbody>
</table>
At 33.3%, billing would be based on a prorated tariff of:

<table>
<thead>
<tr>
<th>Gallons Used</th>
<th>Prorated Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 1,000</td>
<td>$10.00 per 1,000 gallons</td>
</tr>
<tr>
<td>Next 2,000</td>
<td>$8.00 per 1,000 gallons</td>
</tr>
<tr>
<td>All over 3,000</td>
<td>$6.00 per 1,000 gallons</td>
</tr>
<tr>
<td>Minimum bill</td>
<td>$10.00 for 1,000 (33.3% of 3,000) gallons</td>
</tr>
</tbody>
</table>

If a customer was on the system for 10 days and used 500 gallons of water, the customer would be billed the minimum bill of $10.00. Based on the prorated tariff, usage of 0 to 1,000 gallons would be billed at the prorated minimum bill amount of $10.00.

If the same customer was on the system for the 10 days and used 2,500 gallons of water, the customer would be billed $10.00 for the first 1,000 gallons and $12.00 ($8.00 x 1.5) for the remaining 1,500 gallons for a total of $22.00. Usage of 2,500 gallons exceeds the prorated minimum bill of 33.3%, thus billing through the tariff block applies.

**Calculation Example #2:**

If a customer was on the system for 15 days out of 30, each individual tariff block would be reduced to 50% (15 ÷ 30).

Assuming existing tariff of:

<table>
<thead>
<tr>
<th>Gallons Used</th>
<th>Prorated Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 3,000</td>
<td>$10.00 per 1,000 gallons</td>
</tr>
<tr>
<td>Next 6,000</td>
<td>$8.00 per 1,000 gallons</td>
</tr>
<tr>
<td>All over 9,000</td>
<td>$6.00 per 1,000 gallons</td>
</tr>
<tr>
<td>Minimum bill</td>
<td>$30.00 for 3,000 gallons</td>
</tr>
</tbody>
</table>

At 50%, billing would be based on a prorated tariff of:

<table>
<thead>
<tr>
<th>Gallons Used</th>
<th>Prorated Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 1,500</td>
<td>$10.00 per 1,000 gallons</td>
</tr>
<tr>
<td>Next 3,000</td>
<td>$8.00 per 1,000 gallons</td>
</tr>
<tr>
<td>All over 4,500</td>
<td>$6.00 per 1,000 gallons</td>
</tr>
<tr>
<td>Minimum bill</td>
<td>$15.00 for 1,500 gallons</td>
</tr>
</tbody>
</table>

If a customer was on the system for 15 days and used 500 gallons of water, the customer would be billed the minimum bill of $15.00. Based on the prorated tariff, usage of 0 to 1,500 gallons would be billed at the prorated minimum bill amount of $15.00.
If the same customer was on the system for 15 days and used 2,500 gallons of water, the customer would be billed $15.00 ($10.00 x 1.5) for the first 1,500 gallons and $8.00 for the remaining 1,000 gallons for a total of $23.00. Usage of 2,500 gallons exceeds the prorated minimum bill of 50%, thus billing through the tariff block applies.

Examples used in this article are based on monthly billing. Commission Rule 4.3.b refers to monthly or quarterly bills. Very few utilities use quarterly billing. If you have questions concerning quarterly billing or prorating in general, please contact the Water and Wastewater Division of the Public Service Commission for further information.

Deferred Payment Agreements
By Markita Black, Consumer Affairs Technician, Water and Wastewater Division, Public Service Commission

Sometimes, even with planning, utility customers face uncertainties that cause them to fall behind on utility payments and they find themselves facing termination of service. Deferred Payment Agreements (DPA) can be very helpful and provide customers an option to avoid termination of service, while allowing them to pay installments and bring their accounts current.

A DPA allows a customer to stop termination of service by making installment payments toward a delinquent bill. A DPA requires a customer to pay a predetermined amount toward their delinquency, plus their total current bill each month, by an agreed upon date. DPAs differ from extensions or promises to pay in that 1) they are commonly written agreements, rather than verbal; 2) they are enforceable by either party; and 3) the customer can challenge the reasonableness of the proposed payments to the Public Service Commission. While extensions and promises to pay are allowed at the discretion of the utility, DPAs are preferable because they are commonly written agreements between the parties.
According to the Public Service Commission’s Water Rule 4.8.a.9. and Sewer Rule 4.8.b.9., every customer should be given the opportunity to enter into a DPA. The customer should contact the utility for a DPA prior to the date of termination in order to reduce the chances of termination occurring due to last minute issues that may arise. The duration of a DPA can vary, depending on the amount owed and the customer’s ability to pay. If a customer enters into a DPA and their financial situation significantly changes, impacting their ability to honor the original terms, they must notify the utility in order to renegotiate the terms of the agreement.

If a customer enters into a DPA, and does not make the required payment by the required due date, the utility must provide the customer notice as required by Water Rule 4.8.a.9.F and Sewer Rule 4.8.b.9.F. The customer must pay the delinquent payment within the notice period to keep the service from being terminated.

Customers who face a billing delinquency should first contact their utility for more information regarding DPAs. If a customer is unable to resolve their DPA issue with the utility, they can challenge the reasonableness of the DPA with the Public Service Commission. When properly used and honored, DPAs can offer customers an alternative to service termination and give them much appreciated peace of mind.

Welcome to The (New) Pipeline

We hope you enjoy the changes we have made to The Pipeline. Our new 8.5x11" format will make it easier for you to print your copy of The Pipeline so you can share it with others in your organization.

If there are other changes you would like to see, please let us know. We are always eager to hear your feedback and suggestions. We would also like to know which subjects are most interesting to you, and if there are any new areas that you would like our columnists to cover in future issues.

If you have suggestions or would like to give feedback, please contact Nancy Tincher at ntincher@psc.state.wv.us or 304-340-0440.
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