

Ergs, Joules & Such

Notes on Energy Savings for the Rural Water Community and Maybe Others



In previous articles, I discussed regulatory issues. For this column, I thought it would be helpful to begin reviewing some operational practices that can have bearing on regulatory issues.

Line flushing is one such practice and probably a tool that every small system operator is familiar with. As we all know, deadend lines are common in many small systems. Frequently, complaints about water quality are resolved by flushing the line. As we move from hot summer months into colder times with increased possibilities for changes in water quality, flushing may find increased use; it's important that it be done efficiently.

Much has been and continues to be written about flushing. A mild literature review seems to indicate that unidirectional flushing is the most common and recommended practice. Ken Mercer in an AWWA *Opflow* article in December 2010 entitled "How Important Is a Systemwide Flushing Program?", discusses two approaches to flushing in addition to unidirectional flushing.

First, conventional flushing which usually involves opening several hydrants to replace questionable water, but with velocities insufficient to scour lines.

Automatic flushing is where blow-offs are turned on automatically, usually at system deadends.

Mercer concentrates his discussion on unidirectional flushing and specifies that it involves isolating a loop or section by closing appropriate valves and moving water through that area in a direction away from the water source at velocities sufficient to scour the lines.

C. Robert Reiss and his co-authors in an earlier *Opflow* article in March 2010 entitled "Unidirectional Flushing", discuss this procedure in more detail and make the following points:

- ◆ Flow velocities should normally be between five (5) and 10 feet per second (fps). (An AWWARF study in 2003 indicated that velocities in the 1.5 to 2.0 fps range should remove loose particles)
- ◆ Flushing time should be sufficient to flow water equal to twice the pipe volume
- ◆ Valves should be located and operated before flushing
- ◆ Water quality measurements before and after flushing will demonstrate the value of flushing. Reiss reports that in one instance iron was reduced 85 percent, chloramine residual increased 32 percent and turbidity dropped 75 percent

There seems to be no question that flushing is worth the effort. If you are going to spend the time, effort and water to conduct a flushing program, consider using a planned approach similar to unidirectional flushing as opposed to simply opening some hydrants to satisfy a customer complaint.



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