

"Federation Corner" column
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In 2009 Federation detailed cause of water main failures

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This week more than 100,000 Washington Suburban Sanitary Commission (WSSC) customers in southern Prince George's County are without public water service, as the agency works to replace a section of a large diameter water main at risk of imminent failure. The oncoming problem with the pre-stressed concrete cylinder pipe (PCCP) was discovered by an acoustic monitoring system that detected the sound of breaking wires in the reinforcing mesh implanted in the water main.

[NOTE: after this column was submitted for publication, WSSC found a way to circumvent the section of failing pipe they needed to replace and, thereby, maintain service.]

Good for WSSC. They caught this one in time...although the replacement of this section of aging infrastructure will greatly inconvenience tens of thousands of residential customers for four to five days, and cause significant financial damage to businesses in the area, including the temporary closure of all hotels, restaurants and shops in the entire National Harbor complex.

In a series of three Federation Corner columns published in January 2009, now deceased civic activist Wayne Goldstein researched the issue of water main ruptures caused by degradation of the wires comprising the reinforcing mesh imbedded in the PCCP that WSSC uses to carry our public water supply. Those columns are archived on the Civic Federation website at:
<http://www.montgomerycivic.org/federationcorner2009.html>

Even though WSSC proudly points out that in 2010 their break detection monitors predicted the imminent failure of an eight-foot diameter pipe in Montgomery County, leading them to shut off water in that section of the main and replace it, our county has seen its fair share of dramatic water main ruptures. Most if not all of the mains that have failed are comprised of PCCP.

Pre-stressed concrete cylinder pipe was introduced in 1943 as a way to deal with wartime steel shortages and still be able to build large pipes. However, the problems with degradation of the reinforcing wire mesh in these large pipes became apparent as early as 1955. WSSC began installing PCCP in Montgomery County in the 1960s, and major breaks in those pipes started occurring as soon as 1975. But for decades the agency failed to spend the funds necessary to install an adequate monitoring system to try and predict when sections of these large diameter pipes were headed for failure.

In June 2008 a 48-inch diameter water main burst in the Derwood area, sending millions of gallons of chlorinated water into Rock Creek and devastating the plant and animal life in that stream. In December of that same year a 66-inch diameter water pipe failed under River Road, requiring a helicopter to rescue motorists whose vehicles were swept up in the whitewater rapids created by the gusher. A combined total of 255 million gallons of water were lost in these two pipe breaks alone, at a cost of \$500,000 to WSSC.

Even though WSSC has spent \$21.2 million since 2007 on installation of a break-detection system, in March of this year the agency did not receive any warning prior to a massive water main failure on Connecticut Avenue in Chevy Chase. An area newspaper reported at the time that the failure of the 54-inch diameter water main "was the kind of unforeseen rupture that officials in Montgomery and

Prince George's say WSSC assured them would be prevented with investments in a sophisticated break-detection system."

The explosive rupture of the Chevy Chase water main and accompanying release of highly-pressurized water blasted through the asphalt roadway where Chevy Chase Lake Drive intersects with Connecticut Avenue, sending a geyser five stories in the air and creating a 20-foot deep crater. Rush hour traffic on Connecticut Avenue was tied-up for an entire week while repairs to the pipe were being made.

In 2010, an acoustic sensor was installed in the section of pipe that lies under Connecticut Avenue in Chevy Chase by Pure Technologies of Columbia, Maryland, following inspection of the pipe. These sensors are designed to detect the "ping" sounds that are created by the breaking of wires in the reinforcing mesh implanted in concrete water and sewer pipes.

After the Chevy Chase water main burst in March, WSSC officials said they did not know whether the sensor failed or the rupture was caused by something other than weakening wires in the pipe's reinforcing mesh. And a spokesman for Pure Technologies was quick to point out that since 2005 the company has installed acoustic monitoring equipment in 560 miles of pipe worldwide, and it has never failed to detect a weakening pipe in time for the utility to replace the section and prevent a rupture from occurring.

According to WSSC officials, the rupture could have been caused by a problem with a steel joint in the area where a 60-inch diameter pipe joins the 54-inch diameter pipe, a section of the system where there are no reinforcing wires. And a pipe can also fail suddenly if the soil underneath has been eroded.

WSSC officials have told county officials that by this summer they will have installed acoustic monitoring equipment in about 80 miles of pipe which is four feet in diameter or larger. But, considering the possibility of failure of the sensors and the several other causes that could lead to a catastrophic rupture of a large diameter water main, should residents and businesses really find this reassuring?

The views expressed in this column do not necessarily reflect formal positions adopted by the Federation. To submit an 800 to 1000 word column for consideration, send as an email attachment to montgomerycivic@yahoo.com