

THE FUTURE OF WASTEWATER INFRASTRUCTURE

Most Americans don't give a second thought to wastewater once it swirls down the drain or toilet and out of their lives. Municipal wastewater treatment was born to protect the public from the dangers created by discharging raw sewage into waterways. A city's sewer system determines whether residents can fish and swim in their rivers and



streams. For generations, cities dumped untreated waste into rivers whenever loads exceeded the capacity of their limited treatment plants. In June 1969 the Cuyahoga River in Cleveland caught fire and all that began to change. That indelible image led to a national push to clean up America's waterways and to the congressional passage of the Clean Water Act in 1972.

According to the Water Environmental Federation 2005 statement on Sustainable Infrastructure for Clean and Safe Water,

"We have made tremendous progress toward achieving national water quality goals since the passage of the Clean Water Act in 1972. High levels of wastewater treatment are the norm throughout the United States and we enjoy one of the highest levels of water quality in the world. Despite this progress, water pollution still persists. According to EPA's 1998 Water Quality inventory Report to Congress. (http://water.epa.gov/lawsregs/guidance/cwa/305b/98report_index.cfm) 44% of assessed estuaries and 35% of assessed rivers and streams have impaired water quality due to a variety of sources, including inadequately treated wastewater. One of the most critical issues facing Americans is how to improve and maintain our infrastructure to ensure that we fully enjoy the health, economic and social benefits that clean and safe water provides. Infrastructure problems associated with aging pipes, outdated systems, and inadequate capacity to meet growing population demands are requiring many communities to make huge investments in upgrades to their water and wastewater infrastructure systems. According to the EPA, the costs associated with these upgrades range from a low of \$485 billion to a high of \$896 billion over the next twenty years. These amounts are beyond the capacity of some municipalities to shoulder alone. If this challenge is not met EPA estimates that by 2016 water pollution levels could be similar to levels observed in the mid-1970s."

If a community's wastewater received any treatment prior to 1900, this treatment consisted of physically separating solids and floating debris from wastewater before discharge into a nearby waterbody. In 1907, Gloversville, NY built the nation's first wastewater filtration facility, and in 1916, Chicago, IL constructed an activated sludge treatment plant. These advances, called secondary treatment, helped to alleviate epidemics of typhoid, cholera, and other waterborne diseases. This treatment also improved ecosystem health—highlighted by resurging fish and shellfish populations.



The majority of the infrastructure built since 1900, is now at risk of deteriorating to a point that public safety and health are at risk. Repairing and improving the wastewater infrastructure is one of the most significant challenges. The federal government has cut back significantly on its funding for local wastewater infrastructure. What was once a flood of federal dollars has, in recent years, turned into a trickle of funds, primarily loans that must be paid back. The Environmental Protection Agency estimates that the cost of clean water improvements from 2000 to 2019 will be \$388 billion more than federal money currently planned in their gap analysis.

http://water.epa.gov/aboutow/ogwdw/upload/2005_02_03_gapreport.pdf



Early municipal wastewater treatment was done by primary treatment, which employs physical methods such as screens and gravitational settling in clarifiers to remove settleable and floatable solids from raw sewage. Secondary treatment, a biological process was added to remove a much larger amount of organic material. Each phase has added costs. As we learn more about the environmental impact of growing amounts of wastewater, chemicals used in urban

areas, and as the population increases, more treatment and higher costs will be required to maintain our rivers and streams. **It is easy to say we want clean water but each additional EPA requirement that increases the treatment necessary to remove additional pollutants adds millions of dollars to the funding needed for each municipality to pay for that treatment.**