



## A Tale of Two Michigan Cities

This is a story about two adjacent Michigan cities, Flint and Burton. They share the same county, about both cities lie about 70 miles north of Detroit, and each city was saddled with financial constraints that prevented them from fixing their water system.

This is where their stories diverge as each took a different route - with very different results.

### Flint's Story: Iron Pipes with No Relief in Sight

Flint is a city of more than 98,000 residents, 41 percent of whom live below the poverty line. In 2011, the state took over Flint's finances after an audit projected a \$25 million deficit. State and local city water officials subsequently decided to save money by switching the city's water supply from Detroit to the Flint River -- an action that exacerbated the corrosive nature of the iron pipe water infrastructure.

City officials failed to realize that Flint River water is highly corrosive and that the addition of orthophosphates, a chemical used to reduce the corrosion of iron and metal pipes and fixtures, was needed. The absence of orthophosphates caused the corrosion to accelerate, and lead leached into the drinking water of homes with metal pipe water service lines.

While Flint's water troubles have been well-publicized, what is less well known is that the city's corroded water pipes were a breeding ground for human pathogens for years. According to Virginia Tech Professor Marc Edwards, an expert on water treatment and corrosion, Flint's iron pipes were so corroded that they undermine the chlorine's capacity to disinfect the water -- leaving city residents without safe drinking water.

"We now know the untreated corrosive water created a perfect milieu for the overgrowth of opportunistic pathogens like Legionella," said Dr. Mona Hanna-Attisa, a researcher at Flint's Hurley Medical Center.

Indeed, the consequences of the lead pipe crisis have been deadly. Recent statistics from the Michigan Department of Health and Human Services indicate that the number of deaths attributed to Legionnaires' disease at the peak of the Flint water crisis may well have been higher than the 12 originally reported.

Flint's water crisis continues as federal, state and local officials struggle through the politics to determine the best solution to this devastating situation. Meanwhile, Flint's residents continue to suffer.

## Burton's Story: Shifting Away from Iron and Reaping the Benefits

Burton is a city of 29,000 residents. The city suffered an average 40-percent drop in property values in the late 2000's following the housing market crash. By 2013, Burton was two years away from bankruptcy.

The city had faced water system corrosion issues for several decades, and residents often complained about low water pressure and rust-colored tap water. Frequent water main breaks were costing the city a lot in replacement materials and employee man hours. The iron pipes in the city's water system were so brittle and corroded that city water officials had to reduce the water pressure to avoid breaks. Burton city officials knew that they needed to find the funding to fix their broken water system.

As city officials looked for funding they faced another challenge: county codes that did not allow for opening bidding on the type of piping material used to replace corroded pipes. As a result, iron pipe was to be replaced by iron pipe. By not allowing other piping materials to compete for the Burton project, the cost of replacing Burton's corroded infrastructure was well out of reach for this nearly bankrupt city.

To solve the problem, Burton Mayor Paula Zelenko pleaded with county officials to allow the city to bid out the project using other piping materials. Persuaded by the nearly \$2 million dollars in savings that could be achieved, county officials agreed.

Burton subsequently chose PVC pipe to replace 19 miles of water infrastructure at more than \$2.2 million in savings. Mayor Zelenko explained that "[Burton] is looking to the future using PVC water main pipe, which is manufactured as a green product, requires less energy and fewer resources, and has a conservative life expectancy of at least 100 years. Most importantly, because PVC pipe is non-corrosive, the quality of the water delivered to the residents is healthier than water carried by ductile iron. Providing safe drinking water is a top priority for my administration."