

# SPRAY-IN-PLACE PIPE REHABILITATION

## MARKET DRIVERS



### AGING INFRASTRUCTURE LEADS TO WATER MAIN BREAKS AND NON-REVENUE WATER

Drinking water is delivered via one million miles of pipes across the country. Many of those pipes were laid in the early to the mid-20th century with a lifespan of 75 to 100 years. Aging water pipe infrastructure leads to pipe degradation and main breaks. There are close to 237,600 breaks per year in the US leading to approximately \$2.8 billion lost in yearly revenue.<sup>1</sup>



### WATER QUALITY

Decaying pipes can be plagued with heavy tuberculation, biological buildup, and corrosion.



### HIGHER COST OF MAINTENANCE

Aging pipes require more maintenance, and pumps have to work harder because of corrosion and mineral buildup – resulting in pumps wearing out quicker and higher energy costs.

## PIPE TYPES

There are several pipe materials that have been used over the last 120+ years. Each pipe material listed below can benefit from our pipe lining technology.



### Cast Iron

- Cast iron is a metal alloy made of iron, carbon, and silicone. It is cast in a mold to create a pipe.



### Ductile Cast Iron

- Ductile iron is a type of cast iron. It is more fatigue and wear-resistant than cast iron because of the round graphite structures that are cast into the metal.



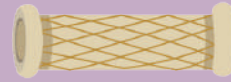
### Concrete Lined Ductile Iron

- Cast iron pipes are lined with cement to increase flow efficiency and prevent tuberculation.



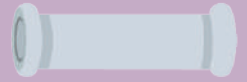
### Concrete

- Concrete pipes are composed of cement (an aggregate of sand and gravel) and water. The concrete pipe making equipment casts the pipes with a rotating mold, giving them a hollow shape.



### Asbestos Cement (AC)

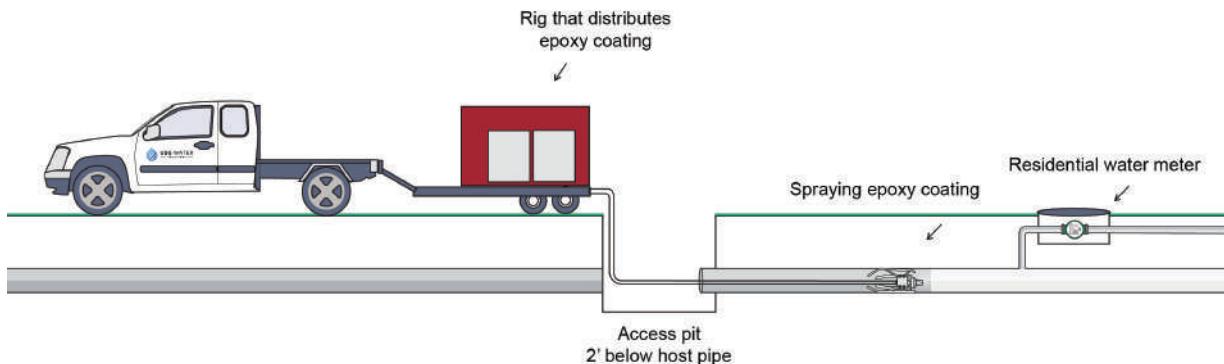
- Asbestos cement pipes are made of a mixture of asbestos fiber, Portland cement, and silica sand, compressed by steel rollers.



### Galvanized Steel

- Galvanized pipes are steel pipes that are coated with zinc.

## SPRAY-IN-PLACE PIPE (SIPP) REHABILITATION



Sources:

1. American Society of Civil Engineers (ASCE) 2017 Infrastructure Report Card

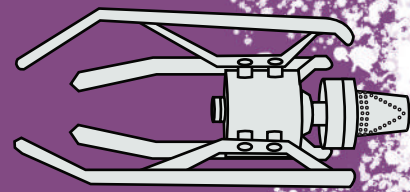
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# HOW DOES SIPP WORK?



## 1 DIG PIT & ACCESS PIPE

We mutually agree with the utility on the access point locations. We then dig an access pit two-feet below the host pipe. A three-foot section of the host pipe is removed to allow access to the relining equipment. We confirm the section of pipe that we are restoring utilizing CCTV.



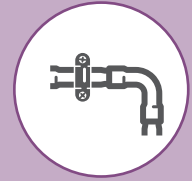
## 2 PREPARE PIPE INTERIOR

The pipe interior is prepared for restoration by drag scraping and/or hydro-jetting to create a clean, smooth dry surface.



## 3 CCTV INSPECTION & REPAIRS

A second CCTV inspection follows to determine that the surface of the host pipe has been fully prepared for the lining.



## 4 APPLY EPOXY COATING

The epoxy coating is then applied and, once cured, we do a final CCTV to make sure the lining is correct. We reassemble the sections of pipe that were removed at the access points. The utility proceeds with the chlorination/disinfection before system restoration.

## COATING

- ✓ NSF 600 approved
- ✓ May extend the service life of pipes by 75 years
- ✓ High build coating – minimum standard thickness is 125mil.
- ✓ 100% solids epoxy
- ✓ No fish kill and safe for aquatic life
- ✓ Manufacturer, Warren, is ISO 9001 certified
- ✓ No VOC
- ✓ Styrene free
- ✓ Highly adhesive and sticks to substrate without leaving any annular space
- ✓ Corrosion resistant

## WHAT ARE THE BENEFITS?

### OPERATING COST SAVINGS

- Extend service life of pipes
- Minimal excavation – 2% excavation compared to traditional dig-and-replace
- No reinstatement of service connections required
- No specific tools required to add new service lines or perform repairs

### CUSTOMER SATISFACTION

- Can improve water quality
- Can improve system efficiency by enhancing flow capacity
- Lining is impermeable epoxy coating

### TIME SAVINGS

- Reduce frequency of maintenance
- Rapid cure
- Minimal disruption