

# Sac City Water Main Rehabilitation

**Dale Barrie, IRWA Training Specialist & Jim Johnson, Sac City Water Superintendent**

**D**uring the summer of 2012 Sac City located in Sac County of northwest Iowa worked with Triton Lining Technologies to line 2,800 feet of water main in their system. This innovative process rehabilitates pipes by centrifugally spraying a solvent-free, protective lining onto the inner surface of the pipe after cleaning to remove corrosion and tuberculation to restore the carrying capacity and flow requirements of the pipe being lined.



The decision to line the pipe was made after contacting several vendors and performing a detailed cost comparison between lining and replacing. It was determined there would be a cost savings of \$1,575,000 by lining the old main instead of replacing it. Since this was the first system in Iowa to use this process, Sac City contacted DNR to go over in detail what the project entailed. It was determined there would be no need for engineering since the project was considered a repair not a replacement.

The project required the completion of a temporary water main system to be built out of 3,000 ft. 2 inch yellow pipe to serve the 41 homes (105 customers) during the six week process. Water samples were sent to the lab for testing and once approved the customers were switched to the new system while the process of lining began. The actual lining process took a total of 8 days.

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Excavation of access openings were made at an average of 207 feet (14 total sites), attempts were made to place excavations at existing fittings such as valves, tees or bends. The mains were drained and cleaning of tuberculation and encrustation on the interior was accomplished by using a drag scraping process. Once the main was cleaned, it was dried using foam swabs propelled by compressed air. The pipes were then inspected using closed circuit television to ensuring the pipe was ready to accept the lining.



The surface of the main is lined using a centrifugal spraying process to apply the epoxy resin. This is accomplished by first pulling the lines through the pipe then attaching the mixer/spray head to be pulled back

through the pipe while the epoxy is being applied. Computerized metering and monitoring equipment allowed for precise control of the thickness of the lining.

Following the application the lines were visually inspected and the mains capped and sealed allowing the resin to cure for sixteen hours. The mains were re-inspected with CCTV after the curing process to verify proper application of the epoxy. The main was then chlorinated, flushed and water samples were sent to the lab and approved. Then the lines were reconnected to restore service. Temporary mains were removed and customers were placed back on the rehabilitated system.

Jim Johnston Water Superintendent says it has been seven months since completion of the project and no complaints have been made, in fact just the opposite. *"We have talked with several customers and they all comment on how great the water has been. The chlorine residuals have returned to normal and nitrates are getting better."*



This was a challenging project for the city and the largest in-house project ever taken on. The city employees worked together to get the project done in a professional and timely manner and saved the taxpayers over \$1.5 million dollars in the process.



Hats off to the City of Sac City Water and Maintenance Departments! 🎩