Rehabilitating 18 Miles of 20” Water Transmission Main in 16 Weeks

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Project Overview

- Carbon steel pipeline built in the 1940's
- HDPE used to isolate city's drinking water from internal coal tar coating.
  - Coal tar impacted water quality
- Engineer couldn't reduce flow

Rehabilitation Alternatives

Technology	How It Works	Relative Cost	Reduces Pipe Flow	Average Installation Length	Comments
Pipebursting	Involves using a cone-shaped bursting head to break the old pipe into pieces, creating a cavity into which a new pipe is pulled from the insertion shaft	$$$	NO	500 to 700 feet	Pipebursting can only be conducted in short lengths, requires more insertion points, takes longer to complete and costs more than many other methods. Dresser Couplings
Sliplining	Involves installing a smaller diameter pipe in a larger host pipe, grouting the air gap between the two pipes and sealing the ends	$	YES	3,000 feet	This method not only requires injection ports every two hundred feet where the grout is used to fill the air gap between the new and host pipes, it also significantly reduces flow.
CIPP	Involves inverting a resin-saturated felt tube from an access point into a damaged pipe, where it cures into a structurally sound pipe-within-a-pipe	$$$	NO	700 to 800 feet	While the shot lengths are shorter than some approaches, installation time is comparable.
Full replacement	Involves excavating trenches and installing new pipe	$$$$	NO	N/A	This approach is the most costly, time-consuming and disruptive to the community, requiring road closures and affecting easements. Because the pipe passed under an interstate highway, full replacement was not feasible for the entire length of the pipe
Compressed fit lining	Involves compressing a polyethylene pipe liner that has a larger outside diameter than the inside diameter of the steel pipe it will be inserted in. After the compressed liner is pulled into the existing pipe, its diameter expands to fit tightly again the pipe wall	$	NO	3,000 feet	This low-cost option allows for relatively long shots, with no reduction in flow capacity
Spray-applied epoxy coating	Involves spraying a coating to the inside of the pipe	$$$	NO	N/A	This approach required removing the existing coal tar coating and cleaning the pipe prior to installation. Applications are limited to the amount of epoxy in the sprayer.

Compressed Fit Liner Technology

- Liner is sized to the ID of the host pipe
- HDPE is compressed through roller reduction box
- Pipe remains in compressed state while under tension
- Liner relaxes after tension is removed and grows to become snug with the host pipe

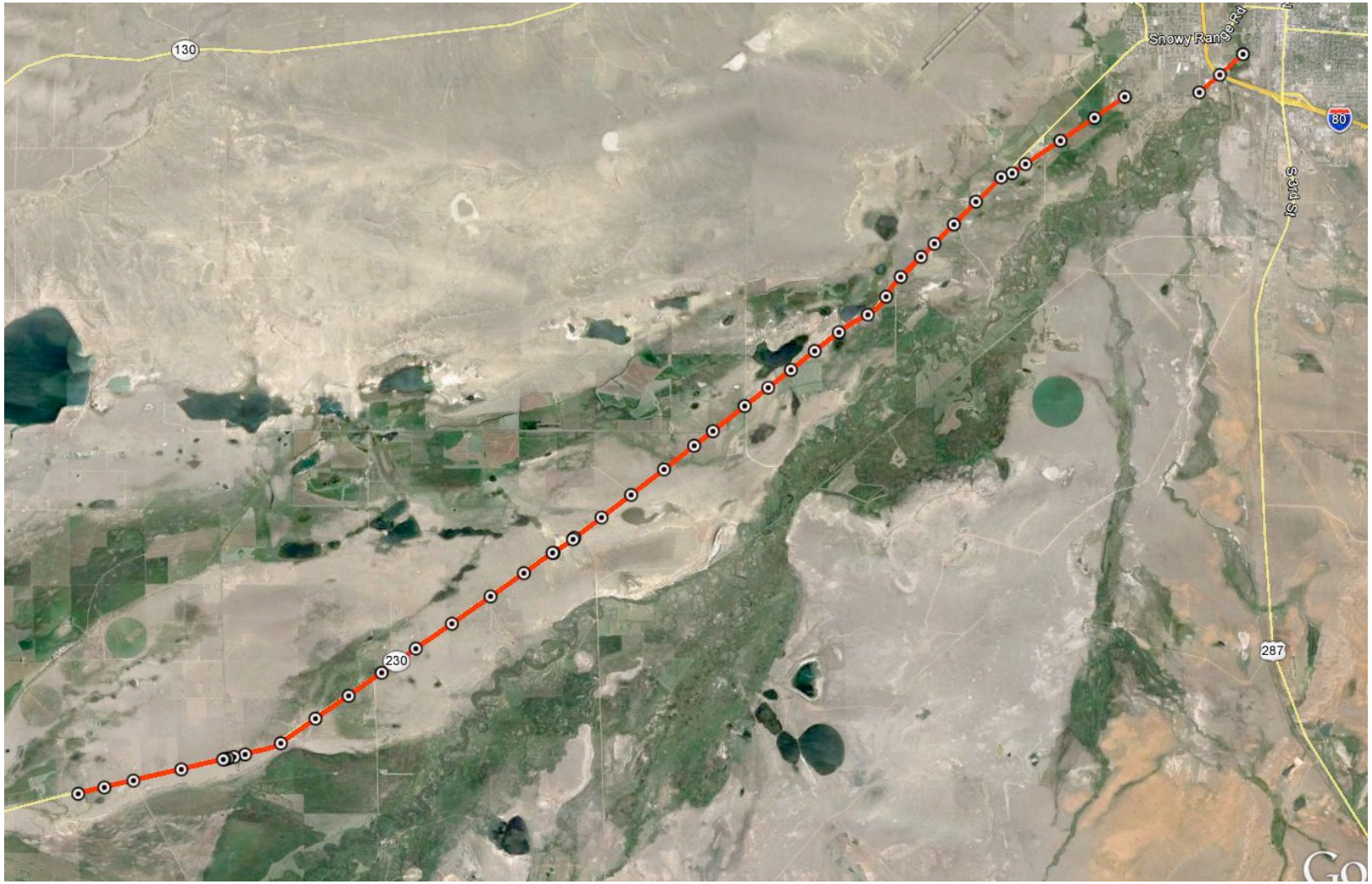
Installation Process

https://youtu.be/bRRq3ALCYac

Scope of Work

18 miles of 20-inch

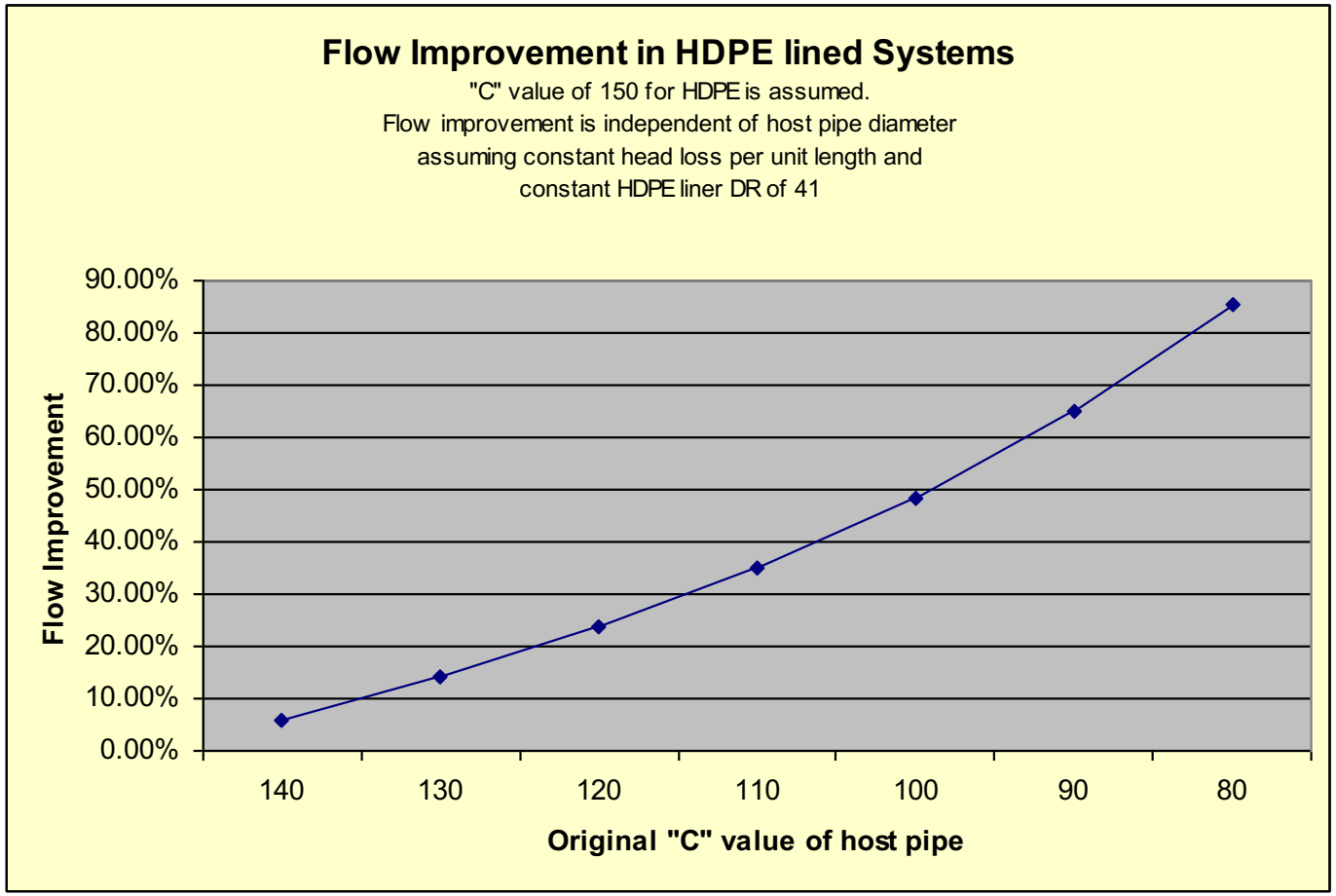
- Gravity line with up to 70psi of head
- 46 sections including 18 service laterals
- Longest pull completed: 3,100 LF



Flow Capacity

Despite slight reduction in diameter, compressed fit liner resulted in increased flow.

150 ‘C’ Value of HDPE



Project Highlights

- Design Build
- Project completed on-time
- Zero safety incidents
- No change orders and on budget
- Exceeded customer's expectations

Project Challenges

Blizzard Like-conditions with 85mph wind gusts

Project Challenges

Required extra ‘rolldown’ due to tar coating and dresser coupling connections

Thank you!

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