



UNDERGROUND CONSTRUCTION TECHNOLOGY

The Underground Utilities Event | July 13-15, 2021 | Music City Center | Nashville, TN

Lateral Lining: Rehab Considerations

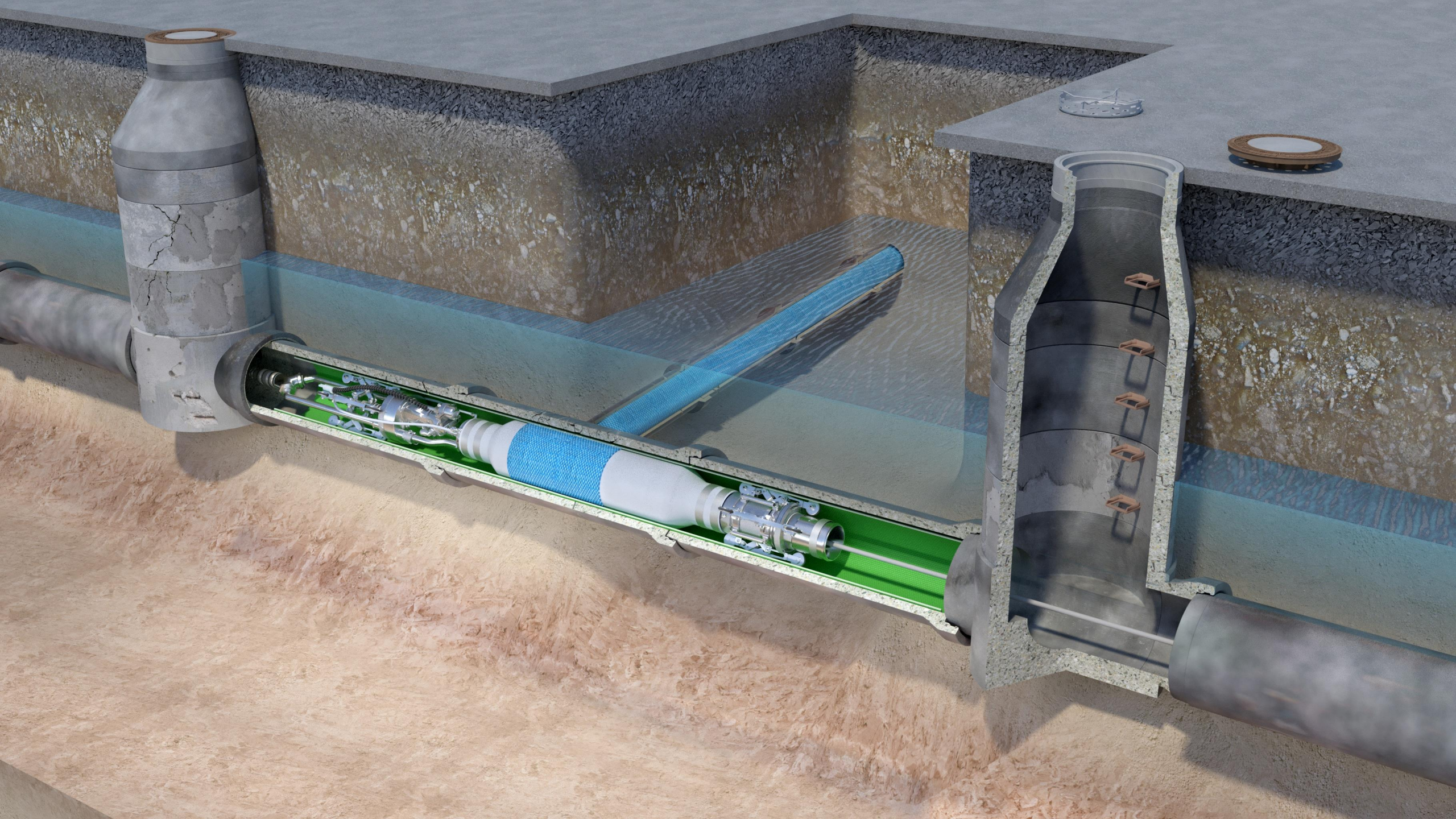


Andrew Boer



CIPP Rehab Considerations

- Property Ownership
- Repair Length

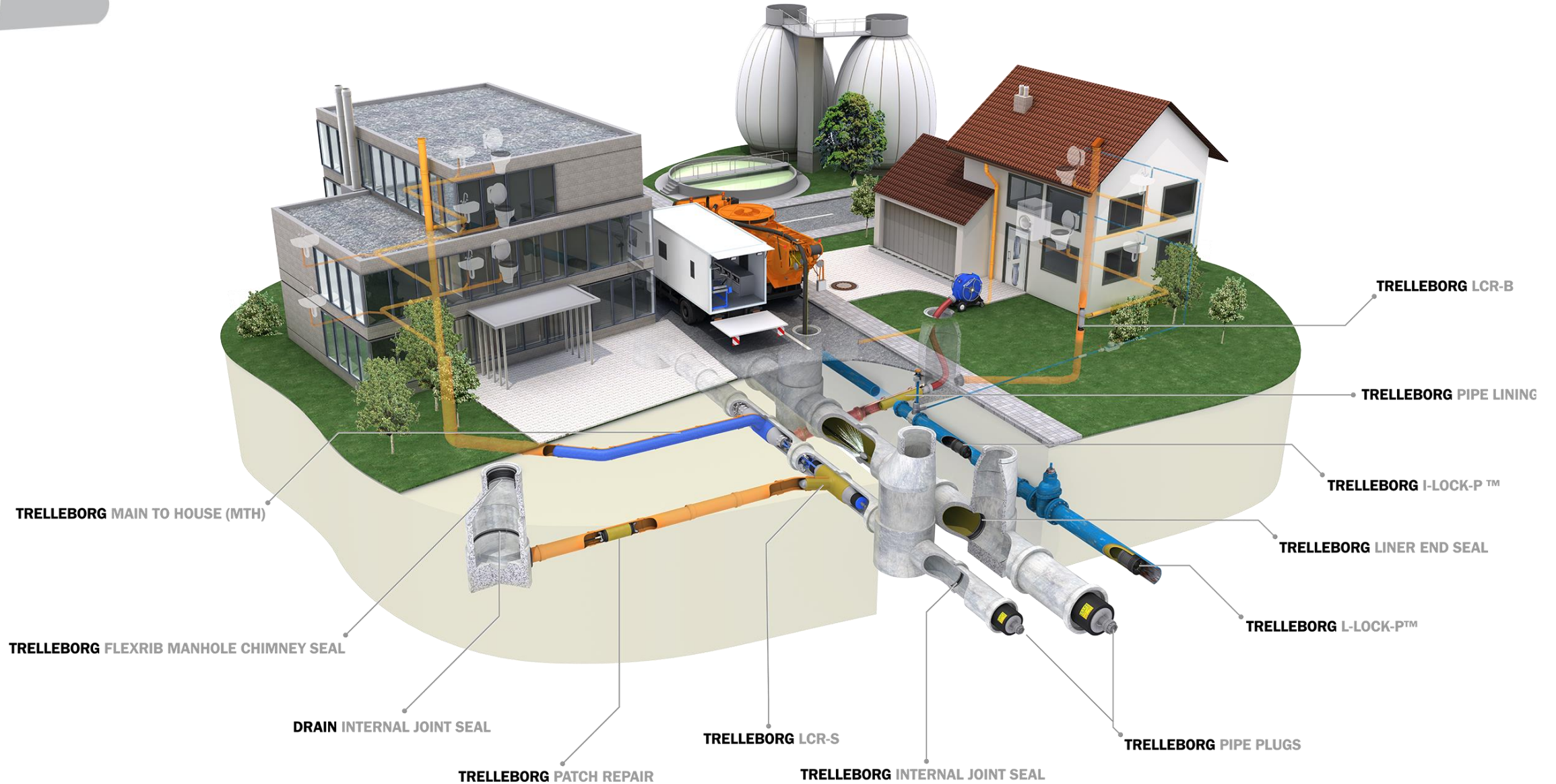






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Why Would We Work on Laterals?



Structural Renewal



Exfiltration

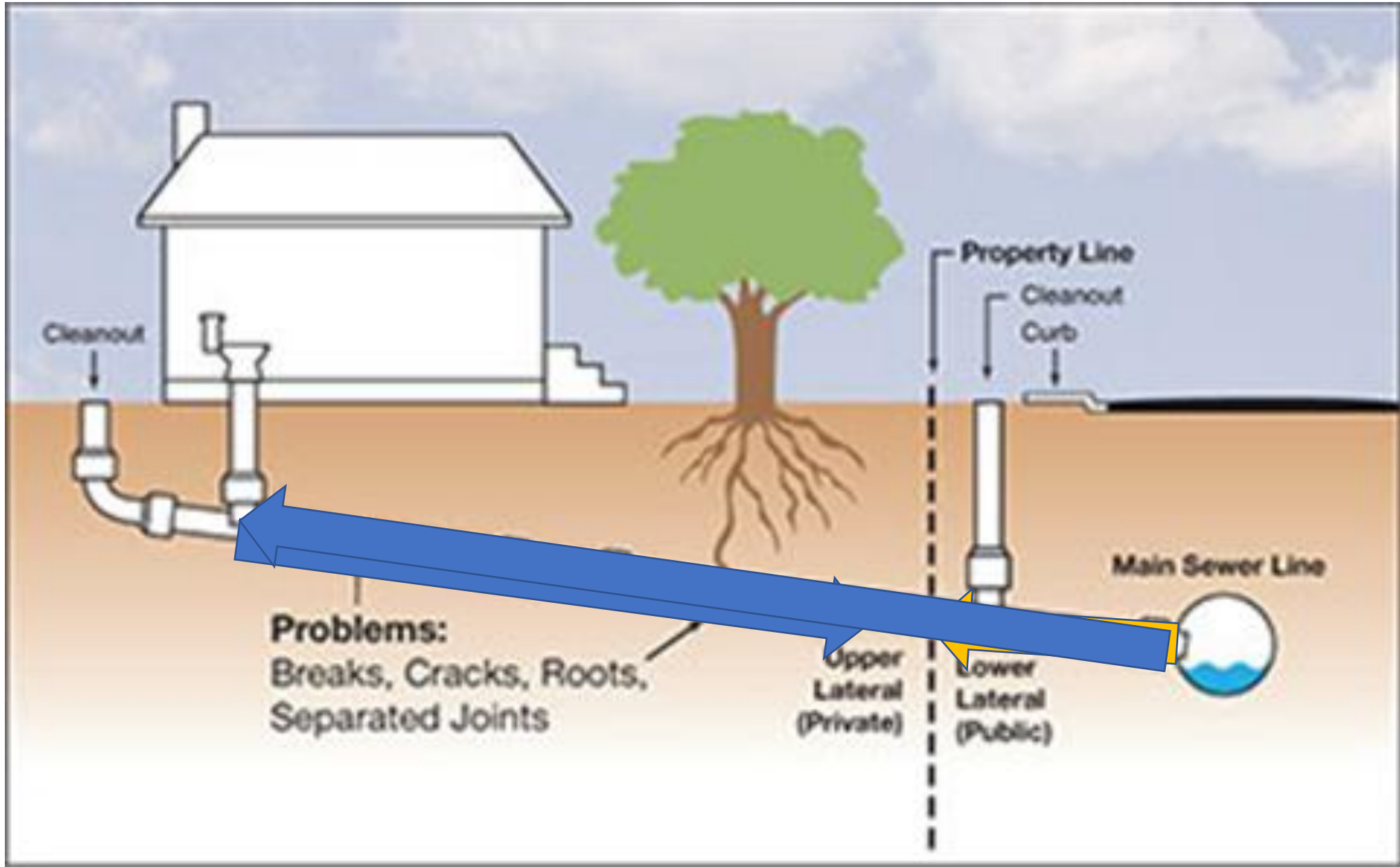


Infiltration



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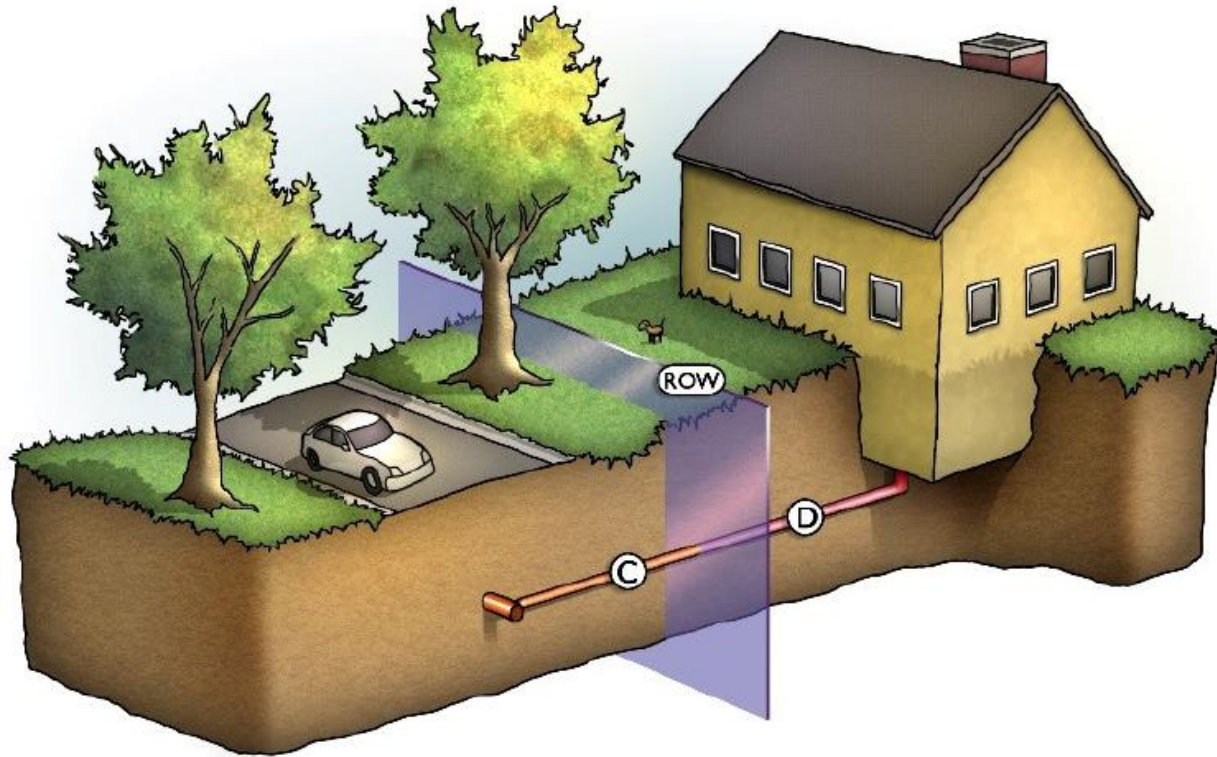
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“...protect their prior investment in reconstructed street pavement, storm sewer pipe, and rehabilitated main, and resulting boulevard restoration.”



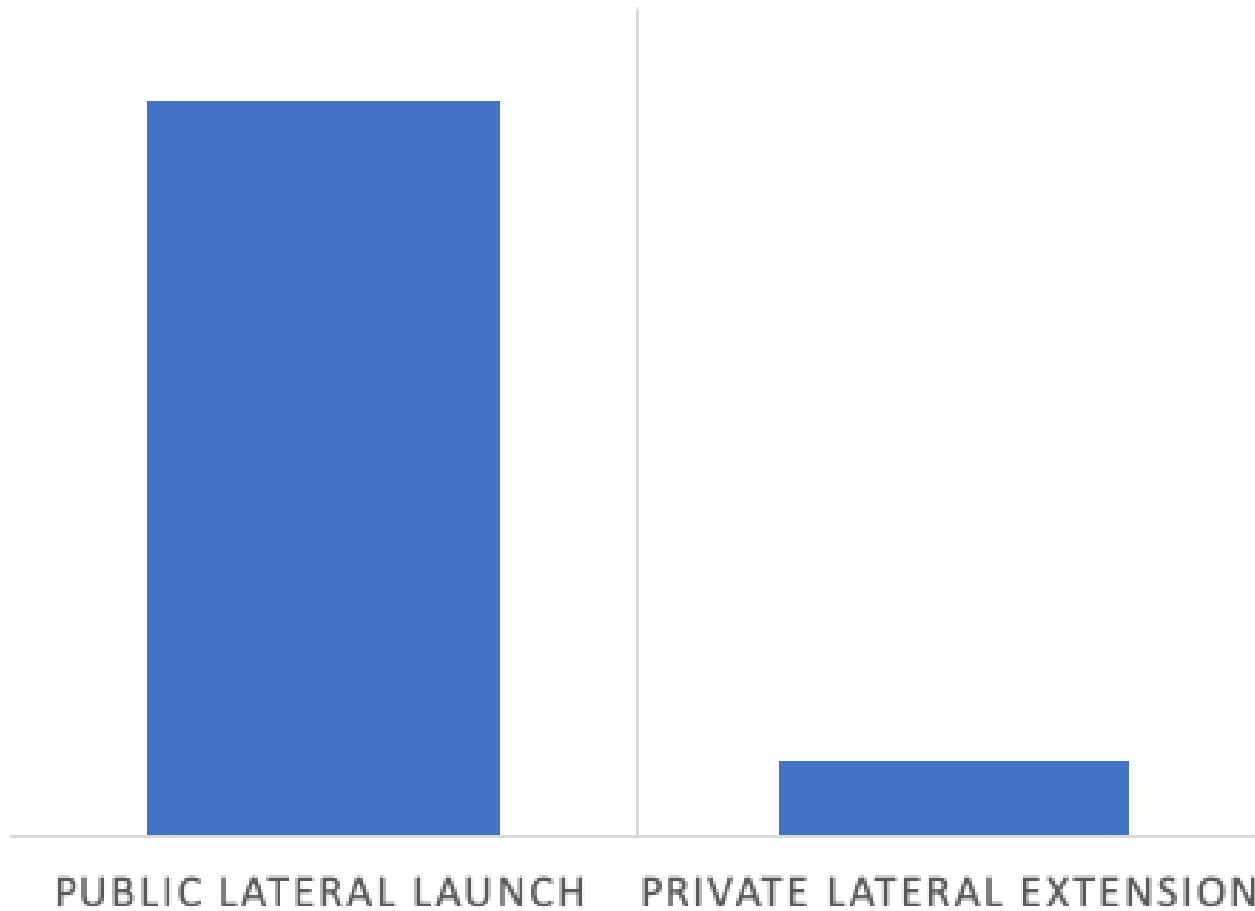
Figure 1. Lateral Considered by Shakopee for Rehabilitation.



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LATERAL COST - PUBLIC VS. PRIVATE





Eliminating Exfiltration

Norwood, MA
Underdrain System
Ecoli Levels

50,000 MPN/100mL



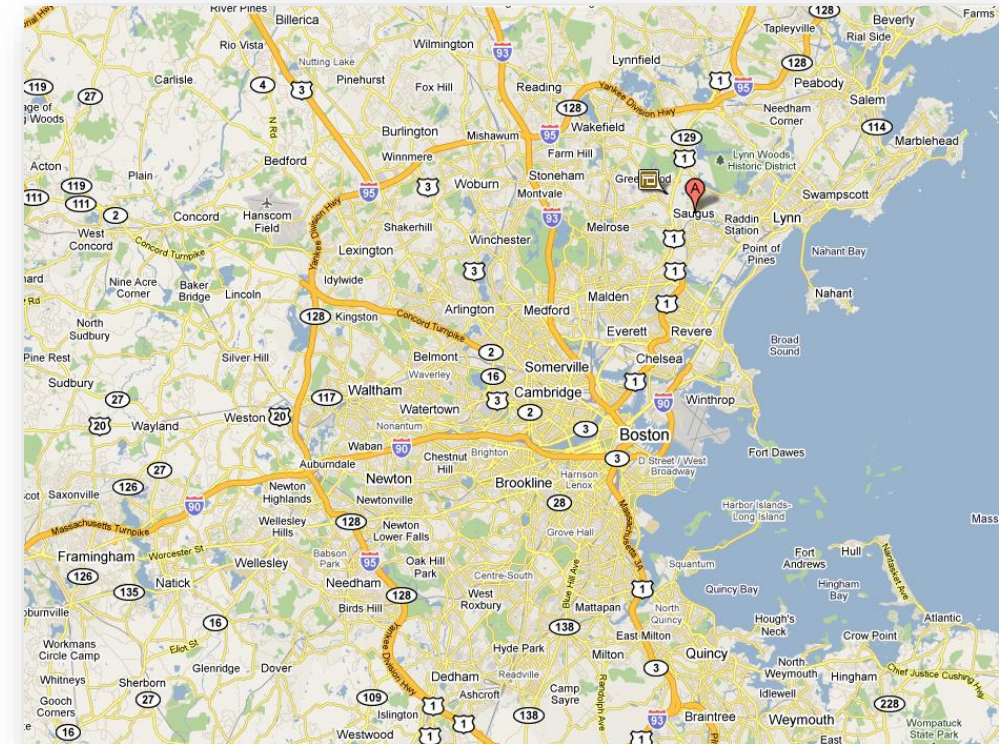
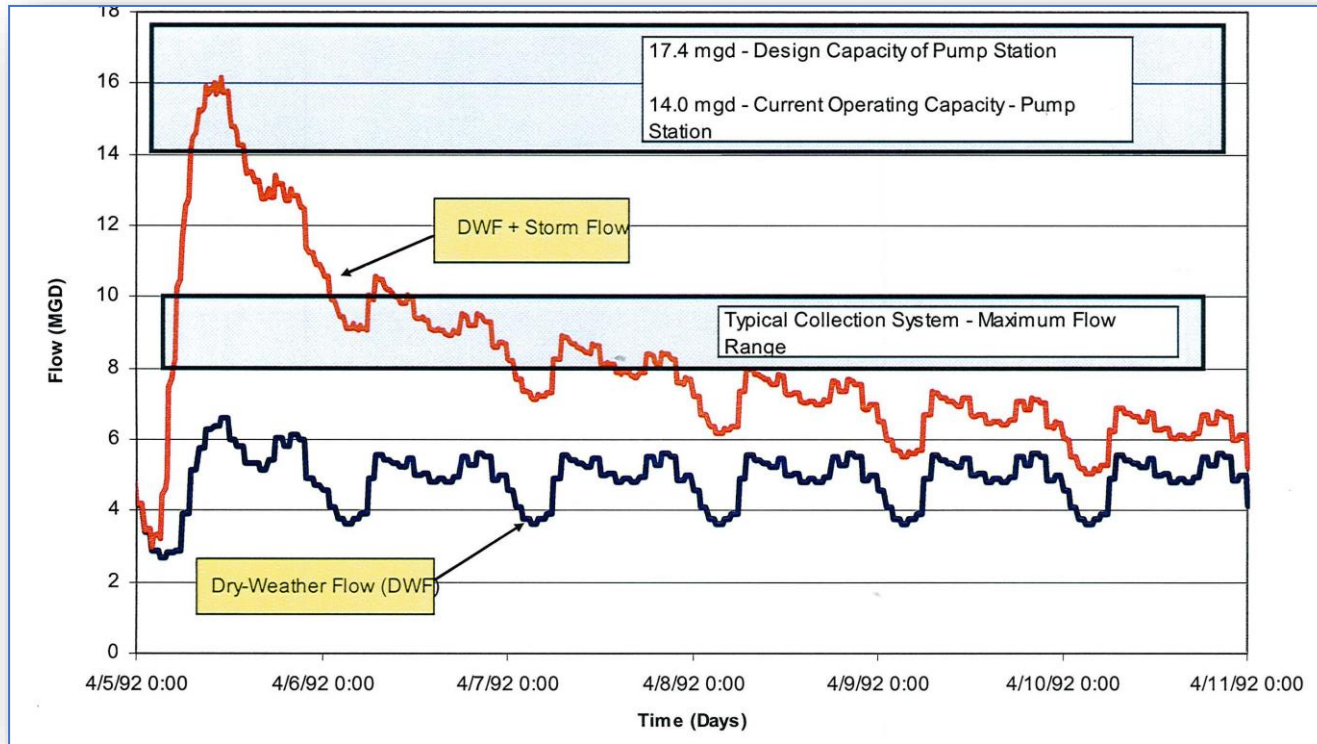
Nearly 0 MPN/100mL

On March 11th, 2015
provided an EPA hosted
webinar to every EPA
office in the nation





Saugus I&I Reduction





Comprehensive Rehabilitation Program

Pilot Program – Subsystem 4A

- Mainline CIPP – 9 Subsystems
 - ~27,000 LF
- Line all service laterals in lined pipe
 - ~400 Laterals
- Rehabilitate All Manholes
 - ~170 Manholes
- Total Cost \$1,927,865
- Completed Winter 2008

Total I&I Program

- Mainline CIPP – 9 Subsystems
 - ~200,000 LF
- Line all service laterals in lined pipe
 - ~3,000 Laterals
- Rehabilitate All Manholes
 - ~1,500 Manholes
- Total Cost \$9.2M

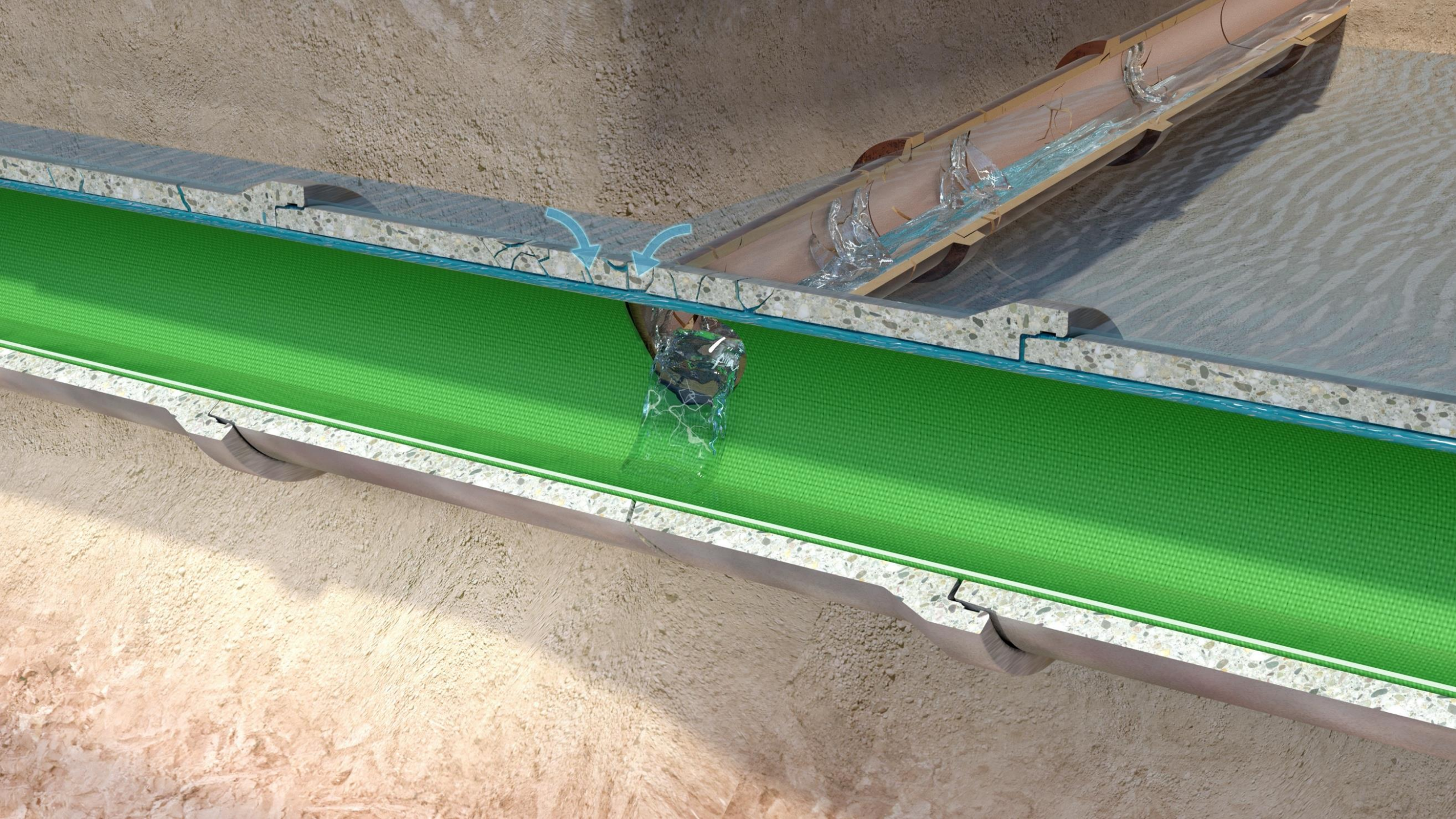




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Year	Subsystem	Pre-Construction I/I Volume 10-Year Storm (million gallons)	Post-Construction I/I Volume 10-Year Storm (million gallons)	I/I Volume Removed 10-Year Storm (million gallons)	Percent Removed (%)	Total Construction Cost*	Cost Per Gallon Removed (Construction Only)
2007	4A	2.20	1.10	1.10	50 %	\$1,927,865	\$1.75
2008	5B	2.10	0.74	1.37	67%	\$ 559,209	\$0.61
2009	PS-5	2.90	1.50	1.40	47%	\$1,608,866	\$1.15
2010	6A	1.85	0.76	1.10	59%	\$ 631,845	\$1.54
2011	4C	2.00	1.02	0.98	49%	\$2,009,748	\$2.05
2012	6B	1.60	0.56	1.04	65%	\$318,637	\$0.31
2013	6	1.50	0.68	0.83	55%	\$1,237,420	\$1.49
Totals		12.57	6.36	7.82	62%	\$9,329,300	\$1.19





Lateral Reinstatement Robotic Cutter



11/24/14 11:09
56.6 FT.

LOUISVILLE BERMUDA
00348 -> 00347
Other Circular 8

Lateral Connections vs. Lateral Lining



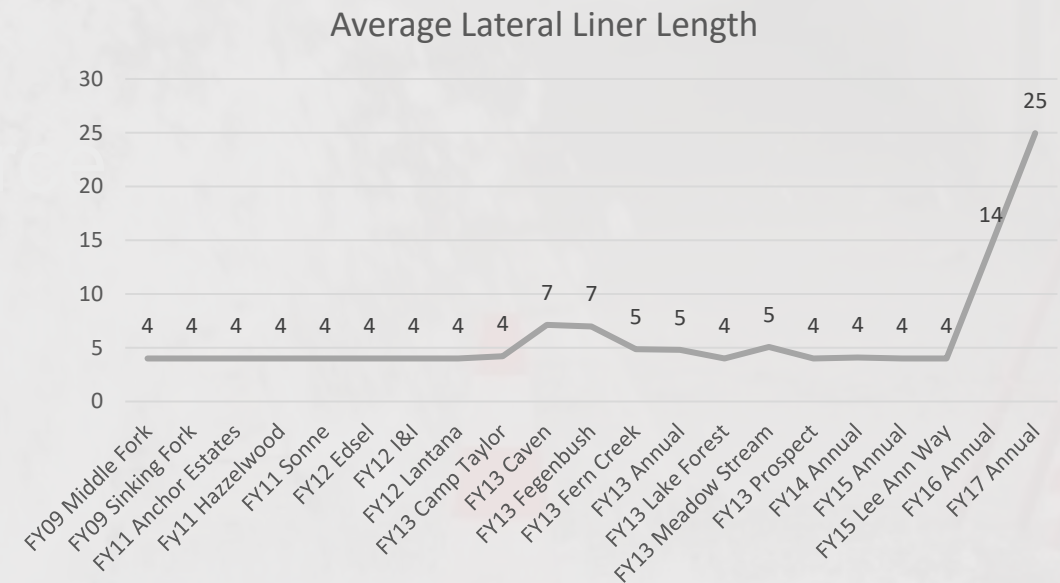
“When we started with 4 foot laterals, we found that the groundwater was moving up higher and still coming in.

Ultimately, MSD determined that going to the property line was more cost effective.

We’ve gotten above the groundwater table and renewed the entire publicly owned length of the lateral.”

-Mike Rock, Stantec Project Inspector

- 247,000 Service Connections
- \$180M Annual Revenue



**MSD is driven by the philosophy of
“Touch the area once and be done.”**





Conclusion

- We don't just rehab sewer pipes for I&I
 - Structural Renewal is critical
 - As Is Managing Exfiltration
- We can repair pipes on both public and private land with assets from the main
- Let's focus on touching the area once and being done