BluKote™ Airborne Lining of Watermains

Process Overview and Demonstrated Results

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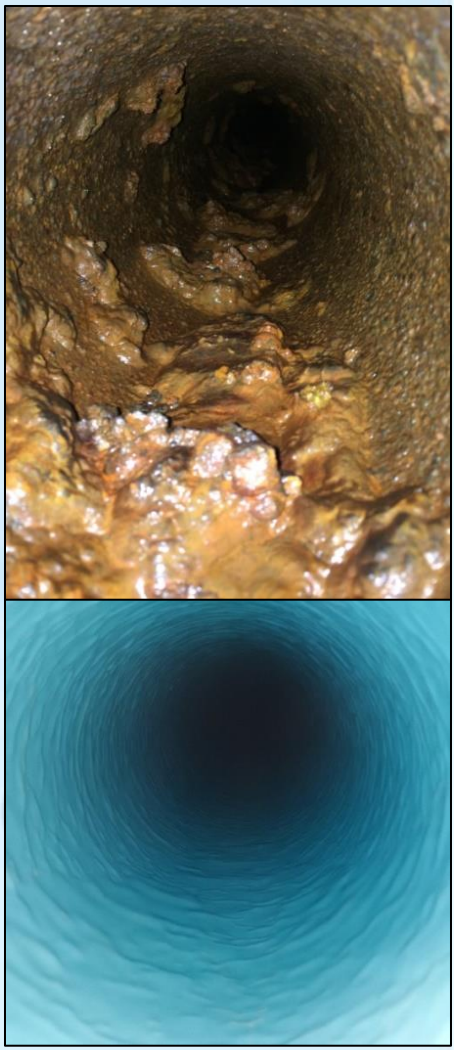
BluKote Airborne Lining

Pressure Water Pipes:

- Low cost, NSF61, non-structural, AWWA Class I, barrier coat lining system for metallic and concrete lined pipes
- Prevent future interior corrosion, deposit build-up and water quality problems
- Tomahawk pipe cleaning and preparation ensures excellent long term liner bond
- 100mm (4”) to 200mm (8”) pipe
- Patented airborne lining process

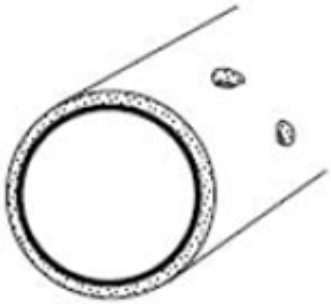
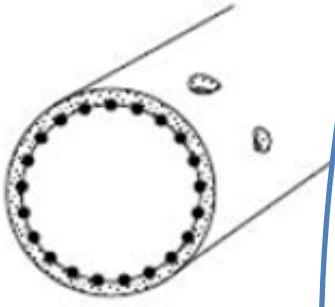
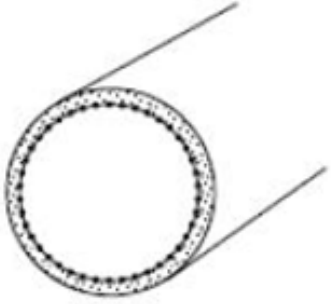


AWWA M28 Structural Classifications for Liners

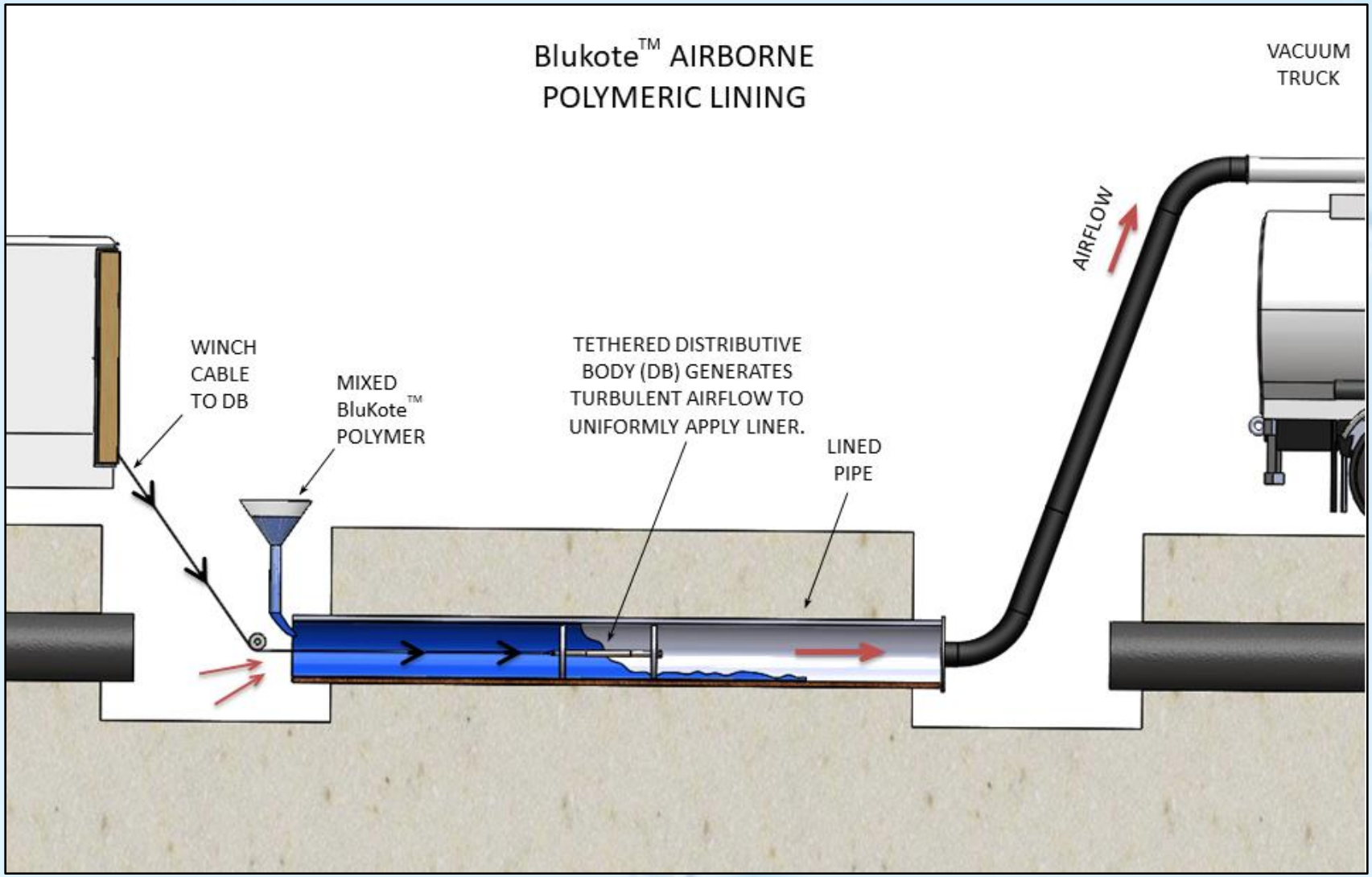
Source: AWWA

BluKote

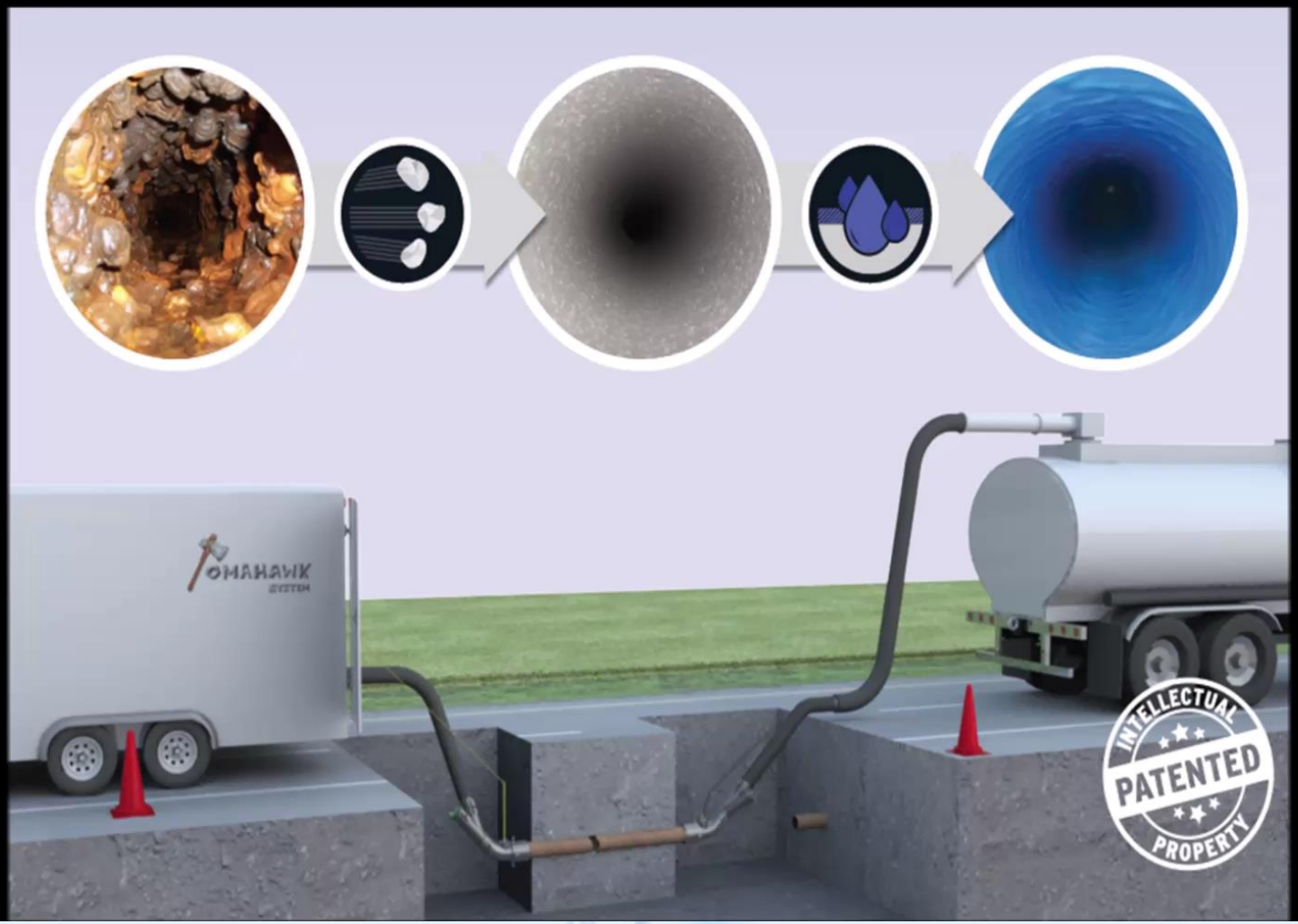
Hole spanning capability

Class IV		Class III	Class II	Class I
				
loose-fit	close-fit	inherent ring stiffness	relies on adhesion	relies on adhesion
Independent		**Interactive**		
Fully structural		**Semi-structural**		**Non-structural**
Lining with continuous pipes				Techniques outside scope of this standard
	Lining with close-fit pipes			
	Lining with cured-in-place pipes			
			Lining with adhesive-backed hoses	

BluKote Airborne Lining



BluKote Airborne Lining Animation



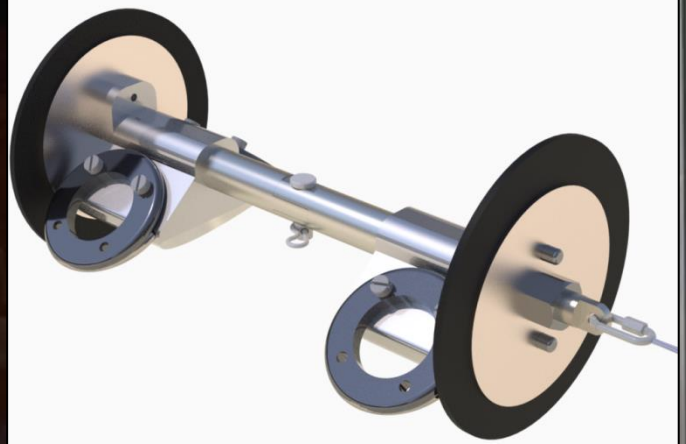
Click here to view video

BluKote Lining Process

On-site preparation and mixing of BluKote resin

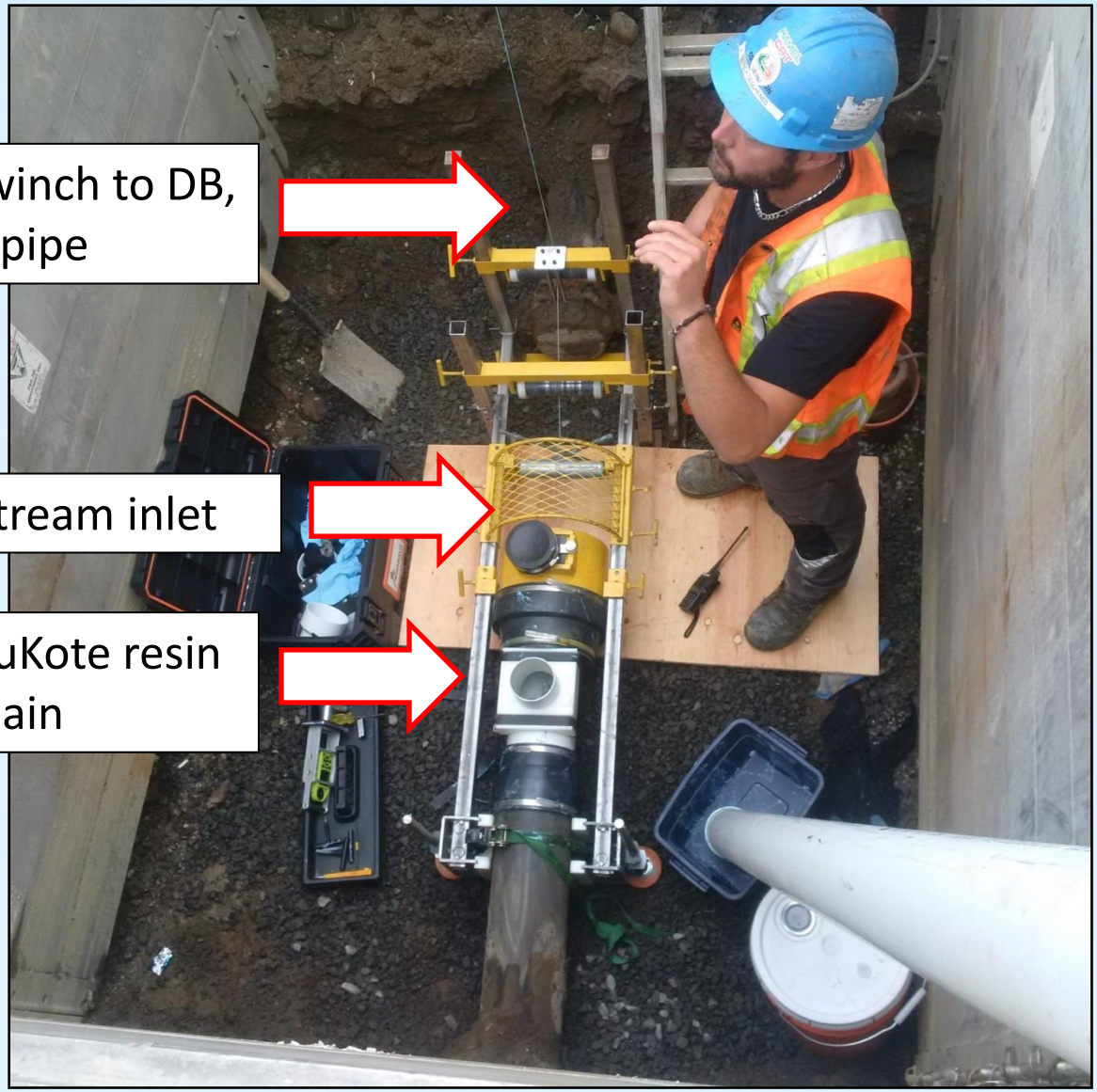
Winch controls Distributive Body (DB) travel through pipe

DB applies BluKote to pipe wall



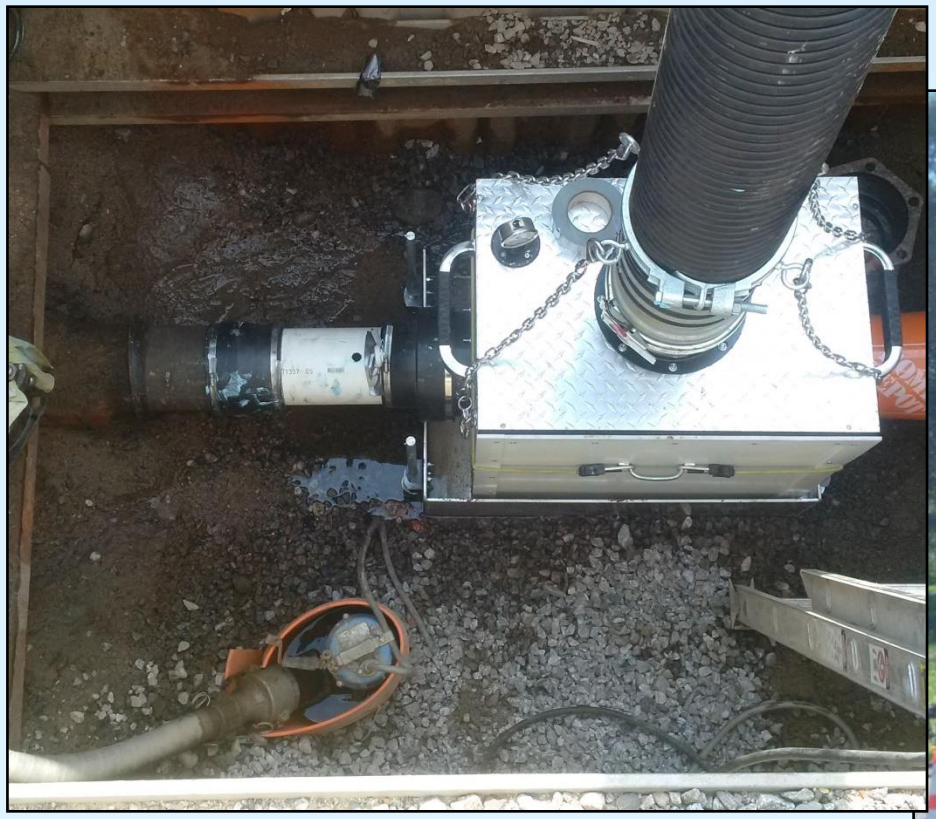
Wire cable to DB located in pipe

Material Inlet set-up in near access pit



Pouring mixed BluKote into watermain from ground level

Material Outlet located in far pit, separates excess lining material from airstream before air enters vac hose

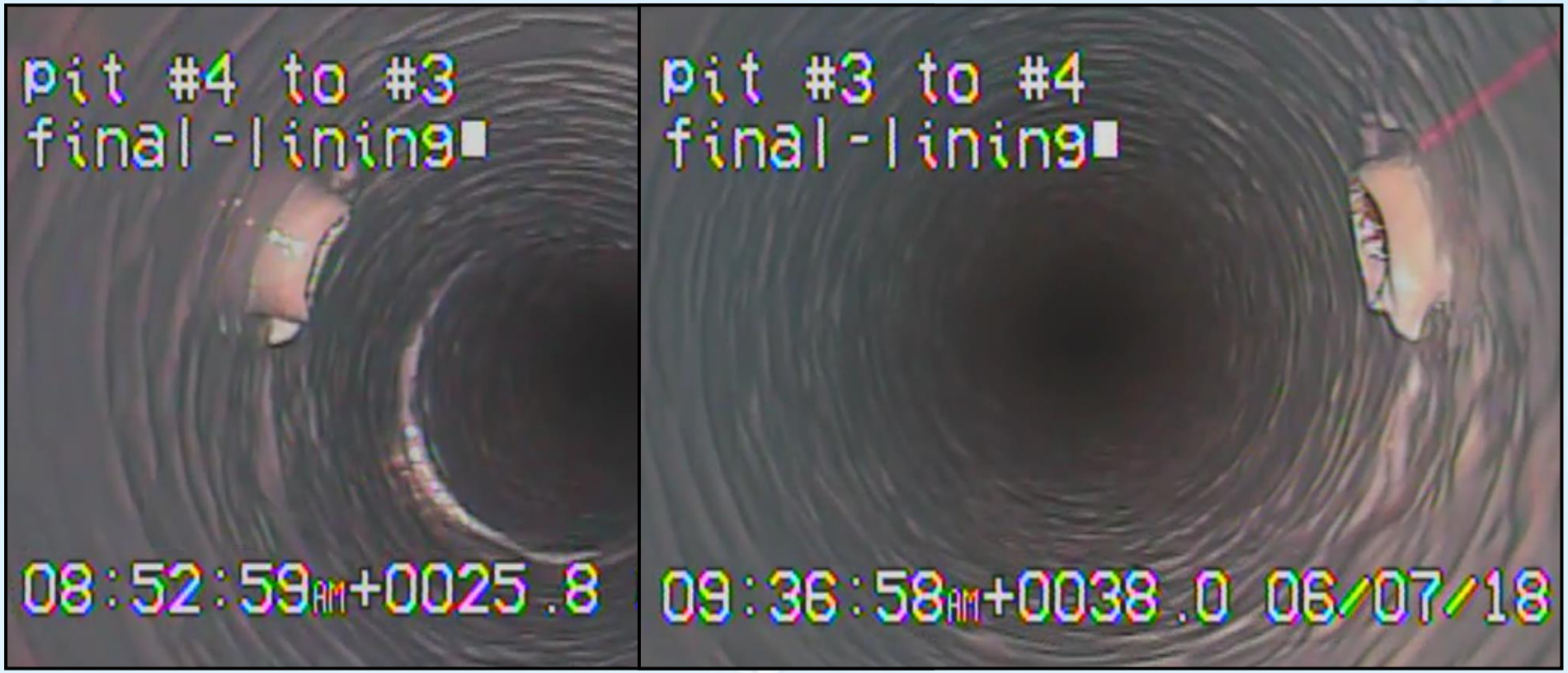


Vac truck generates airstream


Before
After

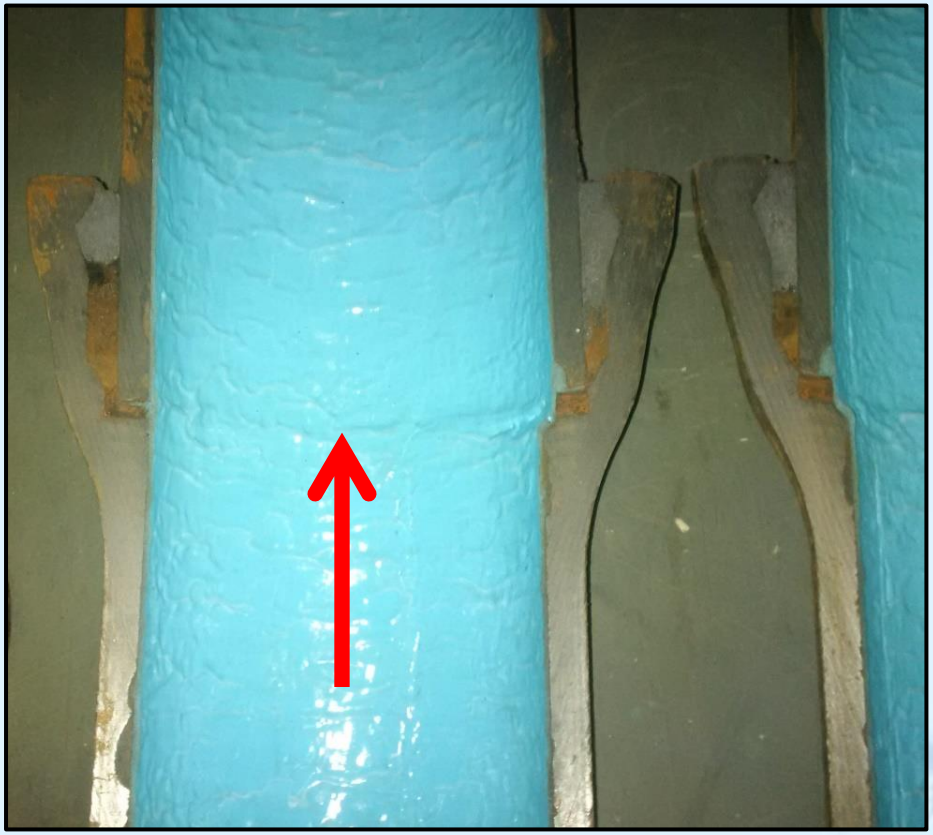
Service Connection Coverage

Lining material is continuous around service connections

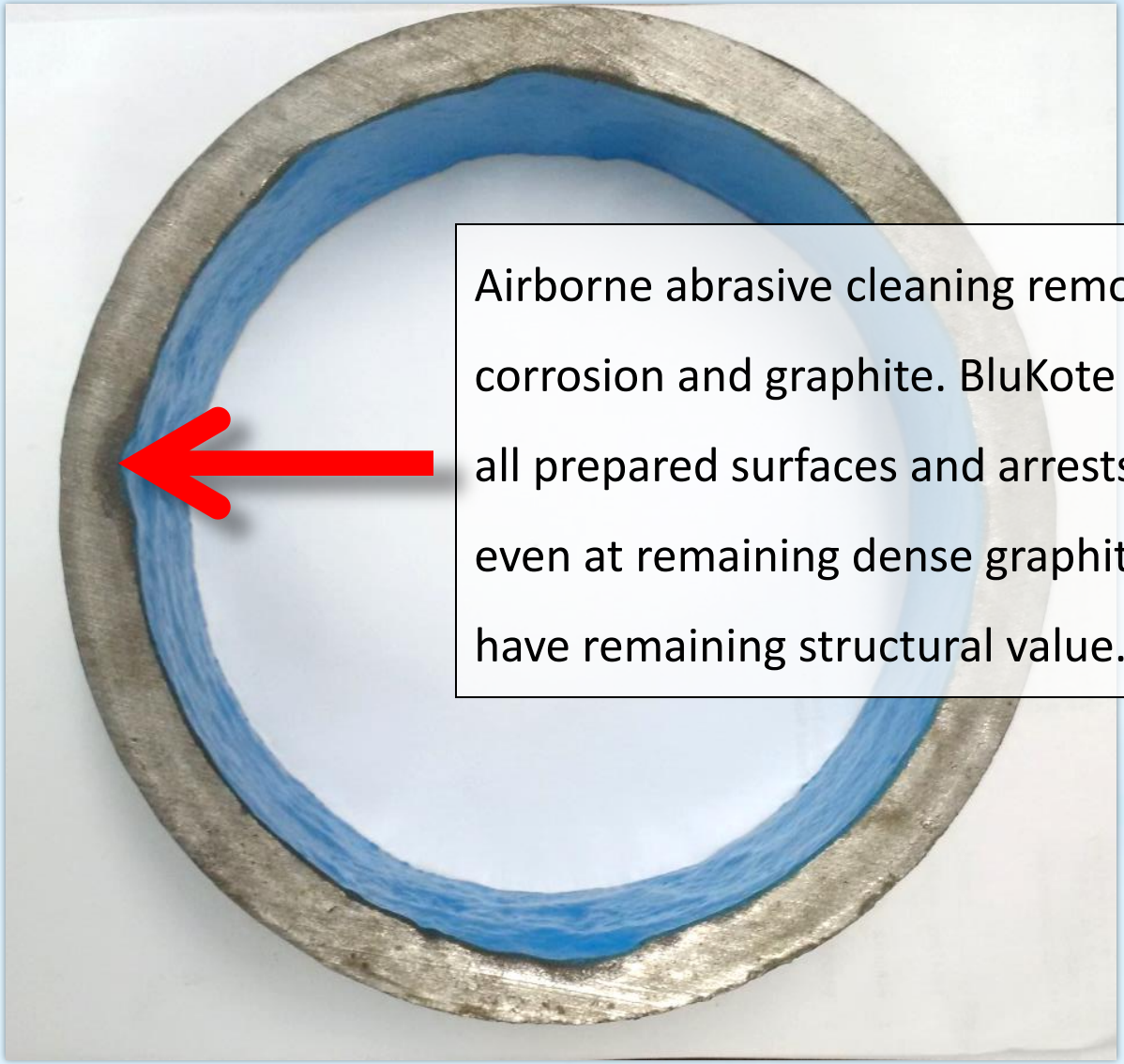


Joint Coverage

Airborne abrasive cleaning dries pipe joints during preparation, lining process fully coats for a continuous liner



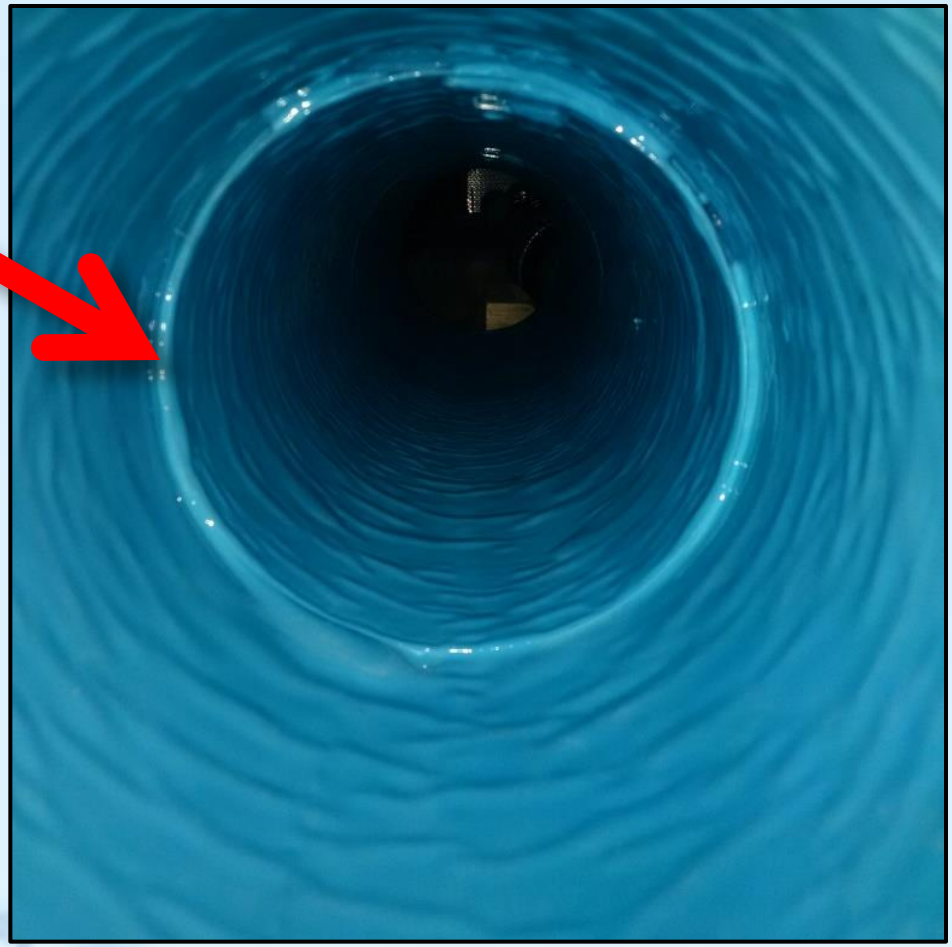
Dense Graphite Plug Coverage



Airborne abrasive cleaning removes loose surface corrosion and graphite. BluKote coating bonds to all prepared surfaces and arrests further corrosion even at remaining dense graphite plugs, which have remaining structural value.

Internal Repair Sleeve

- After pipe evaluation, a 250psi, NSF61, stainless steel point repair sleeve can be installed to span holes.
- Lined through to create a continuous, leak-free liner



Bond to Cast Iron

BluKote exceeds ASTM F3182 min. bond of 250 psi

Table 2: A

Dolly No.	Pull-off Strength		Col		
	MPa	psi			
1	14.5	2095.8	Glue		
			Linin		
			Subst		
2	11.3	1631.7	Glue		
			Linin		
			Subst		
3	18.3	2655.6	Glue		
			Linin		
			Substrate *(A)*	0%	*A/B*

Bonding tests conducted after 12 months soaking

Testing conducted by CATT at the University of Waterloo

BluKote Material

- Blue in color, 2 part, polyurethane/polyurea hybrid
- ANSI/NSF 61 certified
- Cure: 30 min gel @21°C
  - Approx. 3 to 7 hours “tack free” time depending on in-ground temperature, 24°C to 7°C
  - Recoat at “tack free” time, up to 72 hrs.
  - Camera inspection 2x “tack free” time
  - Return to service time, 5x “tack free” time
  - Overnight cure

BluKote Lining Capability

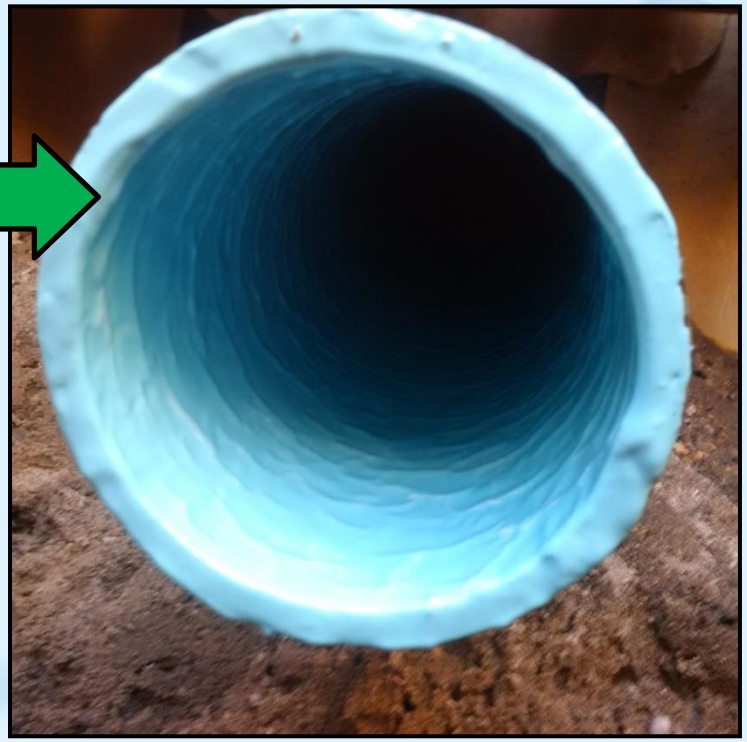
- Lined up to 115m (375 feet) per pipe segment
- One 22.5° elbow per line segment
- High bond to properly prepared host pipe >1,000psi
- Coating DFT, 0.75mm to 1mm, for single coat

BluKote Airborne Lining Results

North Bay, Ontario

Spring 2018

460m, 150mm, CI Watermain

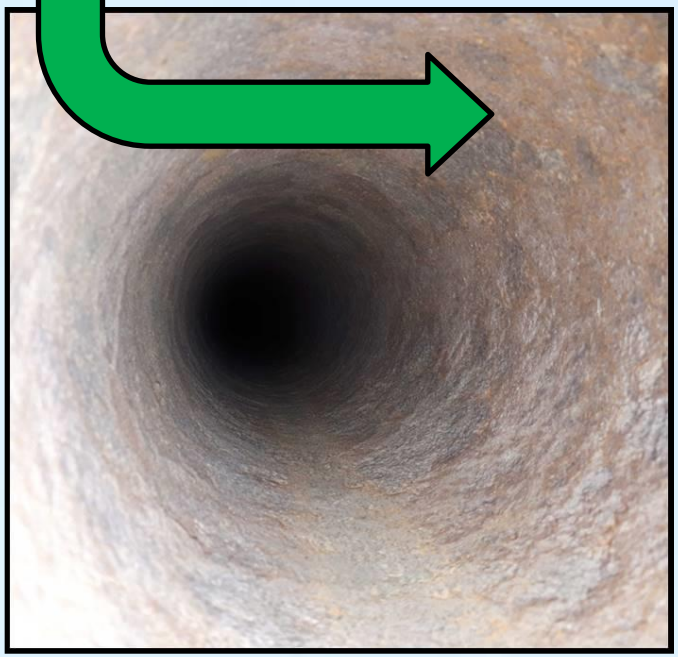


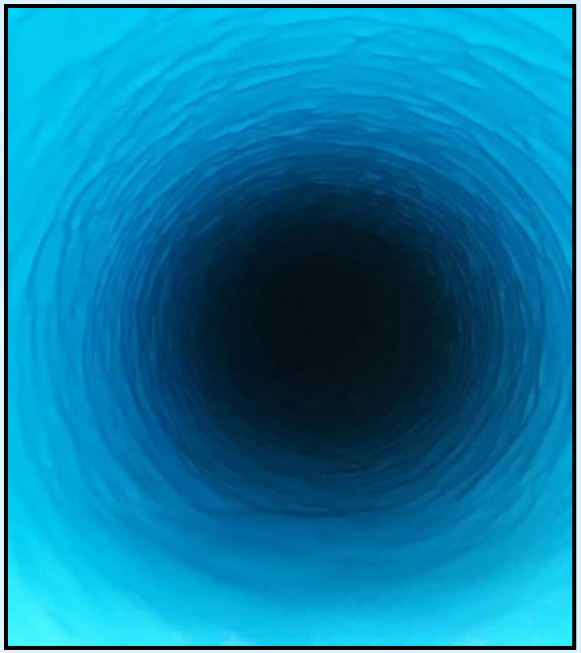
BluKote Airborne Lining Results

Sherbrooke, QC

October 2018

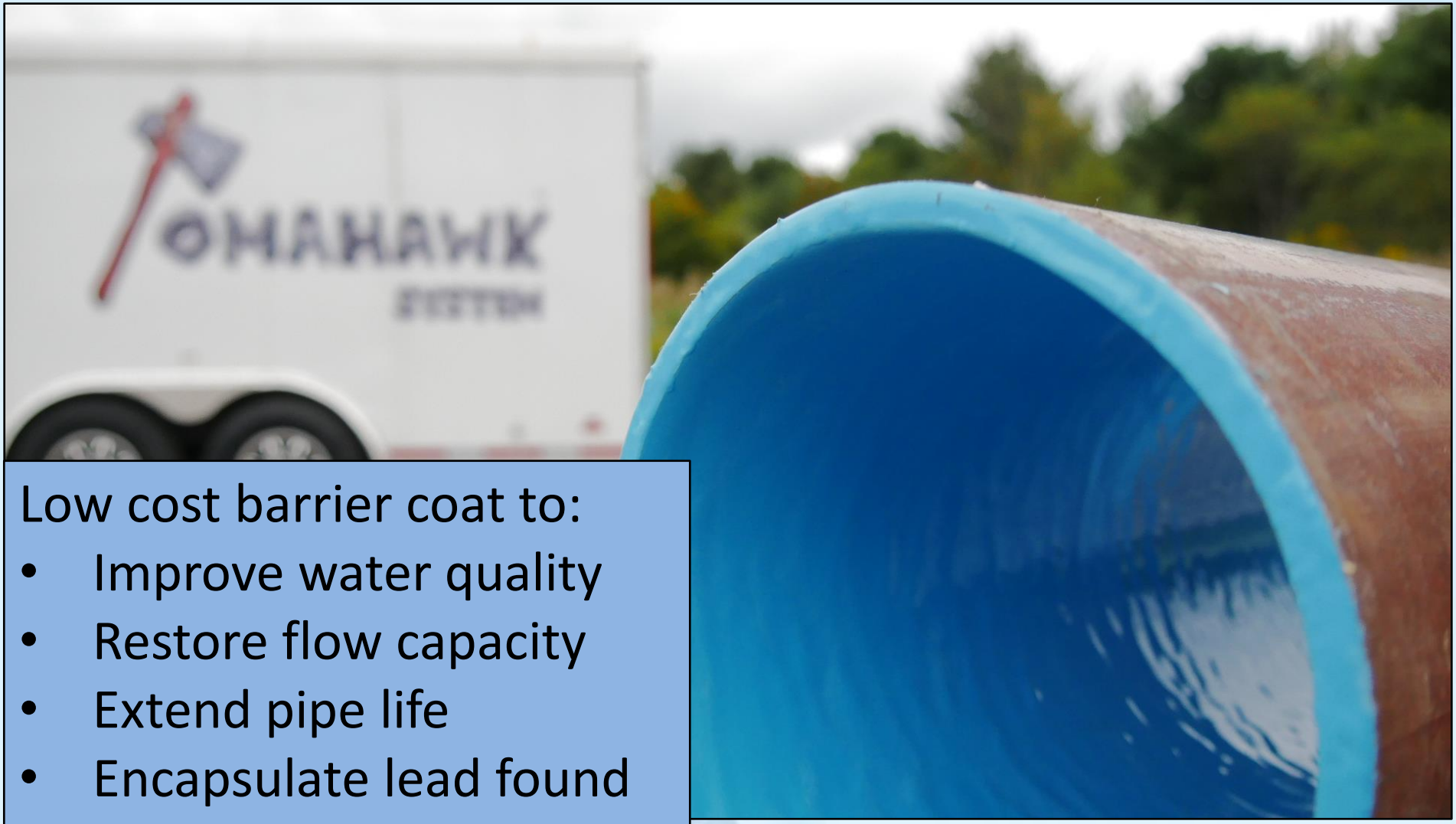
500m, 150mm, CI Watermain





C-Factor improvement 15 to 111!

BluKote™ Airborne Lining



Low cost barrier coat to:

- Improve water quality
- Restore flow capacity
- Extend pipe life
- Encapsulate lead found in pipe joints

BluKote™ Airborne Lining of Watermains

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