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Fortezza da Basso • FLORENCE (Italy)

30th September • 2nd October 2019

The Path Forward for Pipe Bursting Asbestos Cement Pipe in the US

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AM Trenchless**

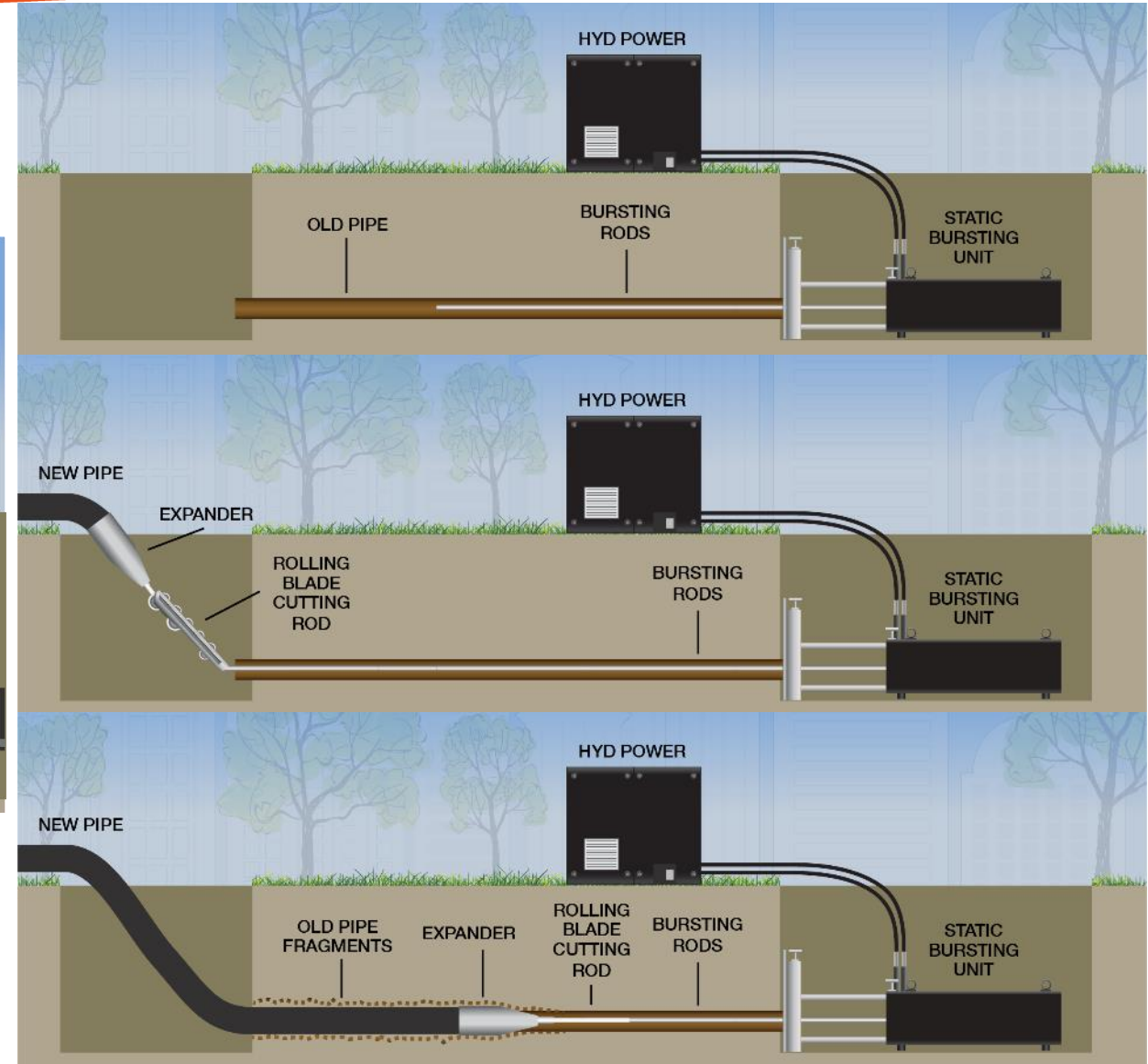
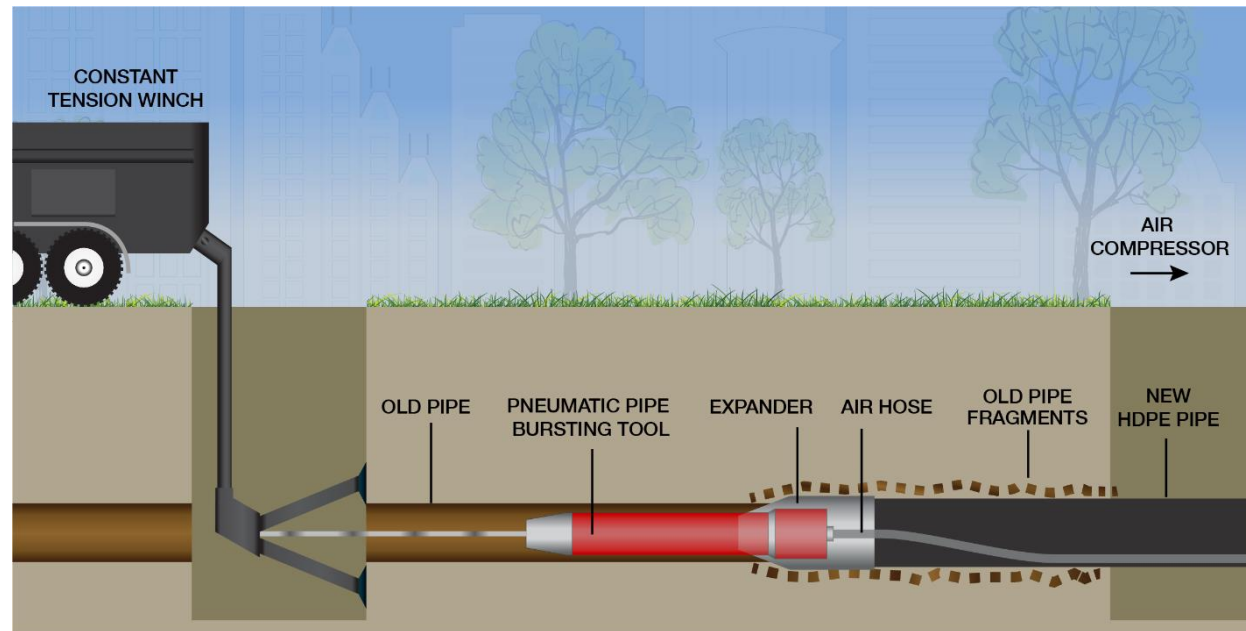
PIPE BURSTING DEFINITION



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- Pipe bursting is defined as a trenchless replacement method in which an existing pipe is fractured in place, and a new pipe with the same or larger ID is pulled into its place. The pipe bursting process uses energy from a cable or rod pulling system, hydraulic or pneumatic power. This energy is transmitted to the expander or pneumatic hammer to burst the existing pipe and temporarily expand the soil cavity surrounding the existing pipe.
- Three things are happening simultaneously
 - **(A) the existing pipe is being fractured or split**
 - **(B) the soil is being expanded to receive the new pipe**
 - **(C) the new pipe is being pulled into the place of the existing pipe.**

PIPE BURSTING – PNEUMATIC AND STATIC



Range of Diameters and Lengths

- Typical range of diameters up to 54" but typically used for pipes smaller than 36"
- The majority of pipe bursting projects are between 6" and 12"
- Typical lengths of pipe bursting runs are between 300' and 500'
- Production levels are affected by the number of required excavations
- Much longer lengths of pipe bursting runs have been performed but take longer
- Pipe bursting typically can not pull through manufactured bends (greater than 22 degrees), valves and tees



PIPE BURSTING VS. OPEN CUT

- Reduced carbon emissions
- Protection of the environment, trees, landscaping, and other natural ecosystems, particularly developed urban and suburban environments
- New line does not occupy new space in the right-of-way
- Reduced traffic impacts
- Reduction in damage prevention to third-party utilities
- Substantially reduced amount of excavation





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History of Asbestos



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Naturally occurring mineral fiber

Attractive attributes

- Fire and chemical resistance
- Flexible, long, thin fibrous shape
- High strength

Use noted as early as Ancient Greece

Use of asbestos supported nationwide during the early 20th century

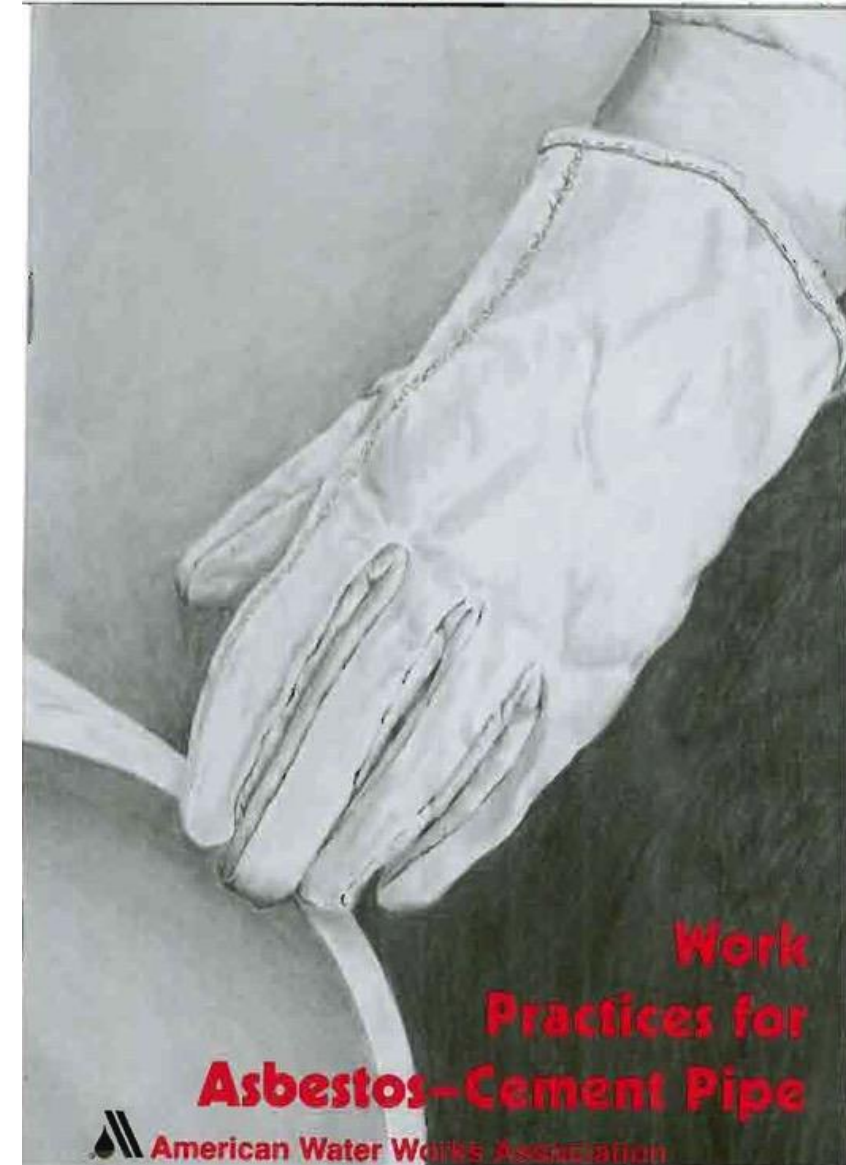
US Navy was #1 consumer of asbestos during the first half of the 20th century

Knowledge of inhalation dangers solidified by 1950's



AWWA Work Practices for AC Pipe

- Keep the AC pipe wet
- Don't saw cut the AC pipe to release fibers
- Utilize a snap cutter on the AC pipe



Asbestos Fibers During Rehabilitation

- Work during a multiple recent pipe bursting projects in the United States performed an extensive Negative Exposure Assessment on the pipe bursting project
- Results indicated levels of asbestos ***under*** the limits set by US Occupational Safety and Health Administration
- 0.1 fibers per cubic centimeter of air



Is AC Pipe Friable After Bursting?

- US EPA currently believes AC pipe that has undergone the mechanical process of pipe bursting SHOULD BE SUBJECT TO NESHAP.
- RACM is defined as friable asbestos material or non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading or has crumbled, or been pulverized or reduced to powder in the course of demolition or renovation operations



***RACM is regulated
AC pipe that can be
further reduced to
powder by hand***

NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS




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- Promulgated in 1972
- Part 61 governs 7 key air pollutants
 - Asbestos, Beryllium, Mercury, Vinyl Chloride, Benzene, Arsenic, Radon/radionuclides
- Requires an Act of Congress to change
- Does not provide adaption for technology development
- Does allow for an Administrator Approved Alternate as approved process different from regulations

NESHAP COMPLIANCE – 5 KEY STEPS



- Notice Submit 10 days prior to work (61.145(b))
- Emission Control during work (61.145(c) / 61.150)
- Control Public Access 2' of cover or fencing (61.151 / 61.154)
- Deed Notation for site after work is complete (61.151(e))
- Notice Prior to Digging Up Site 45 days before digging up the site (61.154(j) / 61.1(d))

 **Florida Department of Environmental Protection**
Division of Air Resource Management

DEP Form 62.257.000(1)
Effective 10-12-08
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NOTICE OF DEMOLITION OR ASBESTOS RENOVATION

TYPE OF NOTICE (CHECK ONE ONLY): ☒ ORIGINAL ☐ REVISED ☐ CANCELLATION ☐ COURTESY
TYPE OF PROJECT (CHECK ONE ONLY): ☒ DEMOLITION ☐ RENOVATION
IF DEMOLITION, IS IT AN ORDERED DEMOLITION? ☐ YES ☒ NO
IF RENOVATION:
IS IT AN EMERGENCY RENOVATION OPERATION? ☐ YES ☒ NO
IS IT A PLANNED RENOVATION OPERATION? ☐ YES ☒ NO

I. Facility Name City of Casselberry Potable Water System
Address Project Area 12 (Helen St, Timberlane Trail, Landmark Ln, Lands End, Colony Dr, Aurora Dr, Belle Ave) - Exhibit A
City Casselberry State FL Zip 32707 County Seminole
Site Public Road Right-of-Way (as stated above) see attachment - Exhibit A Consultant Inspecting Site CPE Engineers
Building Size NA (watermain) (Square Feet) # of Floors 0 Building Age in Years 50
Prior Use: ☐ School/College/University ☐ Residence ☐ Small Business ☒ Other potable water distribution system
Present Use: ☐ School/College/University ☐ Residence ☐ Small Business ☒ Other potable water distribution system

II. Facility Owner City of Casselberry Phone (407) 262-7725
Address 95 Triplet Lake Drive
City Casselberry State FL Zip 32707

III. Contractor's Name Killebrew, Inc. Phone (863) 701-0273
Address P.O. Box 6258
City Lakeland State FL Zip 33807
Is the contractor exempt from licensure under section 469.002(4), F.S.? ☒ YES ☐ NO

IV. Scheduled Dates: (Notice must be postmarked 10 working days before the project start date)
Asbestos Removal (mm/dd/yy) Start: see attachment - Exhibit B Finish: see attachment - Exhibit B Demo/Renovation (mm/dd/yy) Start: see attachment - Exhibit B

V. Description of planned demolition or renovation work to be performed and methods to be employed, including demolition or renovation techniques to be used and description of affected facility components: pipe bursting to replace existing asbestos-cementitious water main

Procedures to be Used (Check All That Apply):

<input type="checkbox"/> Strip and Removal	<input type="checkbox"/> Glove Bag	<input type="checkbox"/> Bulldozer	<input type="checkbox"/> Wrecking Ball
<input checked="" type="checkbox"/> Wet Method	<input type="checkbox"/> Dry Method	<input type="checkbox"/> Explode	<input type="checkbox"/> Burn Down
OTHER: <u>pipe bursting</u>			

VI. Procedures for Unexpected RACM: Stop work and notify FDEP

VII. Asbestos Waste Transporter: Name Lenora Const. & Environmental (if req'd) Phone (863) 284-0958
Address P.O. Box 90034
City Lakeland State FL Zip 33805

VIII. Waste Disposal Site: Name Angelo's Recycling (if required) Class III
Address 41111 Enterprise Road
City Dade City State FL Zip 32251

IX. RACM or ACM: Procedure, including analytical methods, employed to detect the presence of RACM and Category I and II nonfriable ACM.
Presumed asbestos-cementitious pipe (category II nonfriable)

Amount of RACM or ACM:
square feet surfacing material
9,365' linear feet pipe
cubic feet of RACM off facility components
square feet cementitious material
square feet resilient flooring
square feet asphalt roofing

X. Fee Invoice Will Be Sent to Address in Block Below: (Print or Type)

City of Casselberry
Public Works Department
95 Triplet Lake Drive
Casselberry, FL 32707

*Identify and describe surfacing material and other materials as applicable: None. RACM is existing asbestos-cementitious water main pipe to be rehabilitated using pipe bursting technology and replaced with high density polyethylene pipe utilizing wet method.

I certify that the above information is correct and that an individual trained in the provisions of this regulation (40 CFR Part 61, Subpart M) will be on-site during the demolition or renovation and evidence that the required training has been accomplished by this person will be available for inspection during normal business hours.

(Print Name of Owner/Operator) _____ (Date) _____
(Signature of Owner/Operator) _____ (Date) _____

DEP USE ONLY Postmark/Date Received _____ ID# _____

WRF #4465 - PROJECT OVERVIEW



- Project to provide water utilities with reliable performance and environmental data relating to asbestos cement (AC) pipe renewal.

- Objectives:

1. Synthesize existing knowledge on AC pipe renewal.
2. Demonstrate technologies to gather environmental impact data.
3. Inform the stakeholder groups of project findings.



Environmental Impact of Asbestos
Cement Pipe Renewal Technologies

Web Report #4465

Subject Area: Infrastructure



ENVIRONMENTAL IMPACT OF AC PIPE BURSTING – WRF PROJECT #4465



There is no evidence to support that the bursting of AC pipe has any negative impacts on the environment or the workers performing the work

Sample Type	No. of Samples	Analytical Sensitivity Range	Sample Result Range	Analytical Method
Air	6	0.0036 - 0.0042 s/cc	BAS	ISO Method 10312
Soil (Pre-renewal)	6	NA	ND - Trace (<0.25% visual estimate)	EPA Method 600/R-93/116
Soil (Post-renewal)	6	NA	ND - Trace (<0.25% visual estimate)	
Water (Pre-renewal)	2	0.17 - 0.35 million structure/L	0.87 - 20.07 million structure/L	EPA Method 100.2
Water (Post-renewal)	2	0.08 - 0.09 million structure/L	0.09 - 0.94 million structure/L	

MITIGATION OF EXPOSURE RISK UTILITY CROSSINGS



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- Occur when other utility companies are required to perform work around remaining AC pipe fragments
- Utility companies will not perform extensive excavation within a few inches of the new HDPE pipe

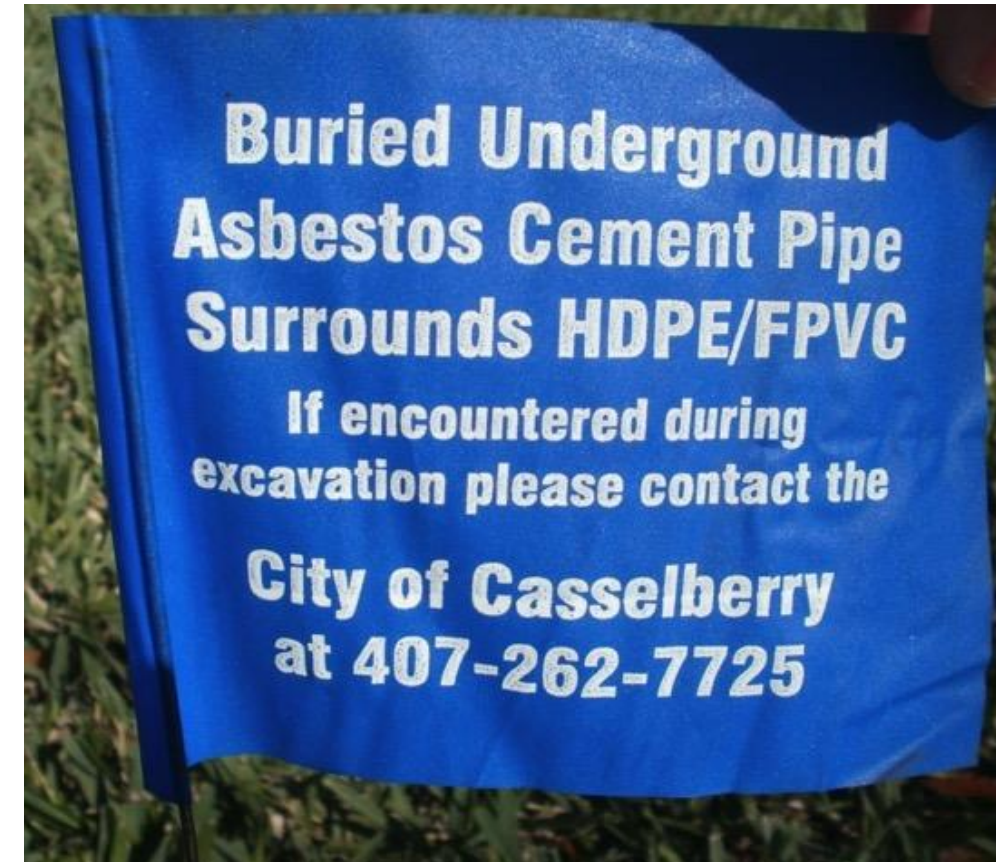
The reality is - all work performed will be below the 260 linear feet threshold set forth by NESHAP

MITIGATION OF EXPOSURE RISK RESIDENT EXCAVATION



- Resident installing new tree or other will not excavate to water main depth for extended length
- Casselberry utilizes special locate flags that will generate questions

The reality is - all work performed will be below the 260 linear feet threshold set forth by NESHAP



MITIGATION OF EXPOSURE RISK REPLACEMENT OF PIPE



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- Utility provider performing AC pipe bursting must acknowledge the risk of future work required around AC pipe fragments
- Emergency repairs will be below the 260 linear feet threshold set forth by NESHAP
- Focused production pipe replacement will occur after production pipe has expelled its service life

The reality is - all work performed will be below the 260 linear feet threshold set forth by NESHAP

RESISTANCE TO AC PIPE BURSTING



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- AC pipe bursting projects can only be performed with all parties acknowledgement of process
- Right-of-way controllers approval
 - Casselberry only owns R/W for 30% of streets where AC pipe is located
- Local Environmental Regulators approval
- General public approval

RESISTANCE TO AC PIPE BURSTING UNCLEAR APPLICATION OF NESHP



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- Active Hazardous Waste Site
 - One year of air monitoring
 - Signs above site every several hundred feet
- In-active Hazardous Waste Site
 - Record notation to deed to property
 - Problem: Public right-of-way has no deed
 - After significant discussion and demonstration of pipe bursting, EPA suggested use of the Administrator Approved Alternate

RESISTANCE TO AC PIPE BURSTING ACTIVE HAZARDOUS WASTE SITES



RESISTANCE TO AC PIPE BURSTING PIPE BURSTING SITES



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QUESTIONS?



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EDWARD ALAN AMBLER, PE, LEED AP
AM TRENCHLESS