AC Bursting, EncapsulAC: Rules, Regulations & Solution

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Benefits of Pipe Bursting: Economic Benefits

- Reduced design and survey costs
- In Florida, pipe bursting does not require a permit and the new pipe can be two sizes larger than the existing pipe
- In developed urban areas, restoration costs can easily exceed pipeline costs
- Reduced third party utility relocation costs
- Less risk equals fewer change orders

Benefits of Pipe Bursting: Social Benefits

- Dramatically reduced construction schedule reduces impact to residents/customers
- Minimized excavations reduces impact to established urban landscaping
- Pipe bursting can replace 300+ linear feet of pipe between 8:30 am and 3:30 pm, some residents don't even notice impact

Happy Customers = Happy City Hall

Benefits of Pipe Bursting: Environmental Benefits

- Reduced excavation minimizes environmental footprint
- Reduced carbon dioxide emissions from less machinery and shortened construction schedule
  - Pipe bursting is found to reduce greenhouse gas emissions over traditional open cut by 75-90%
- Reduces infrastructure congestion

History of Asbestos

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

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

Knowledge of inhalation dangers solidified by 1950's

Manufactured Products Containing Asbestos

- Fibrous insulation - **#1 health hazard**
  - Sprayed in, blown in and electrical

- Roofing Shingles
- Floor and Ceiling tiles
- Brake pads
- Paints, plasters, mastics, adhesives & tape
- Gaskets
- Packing materials

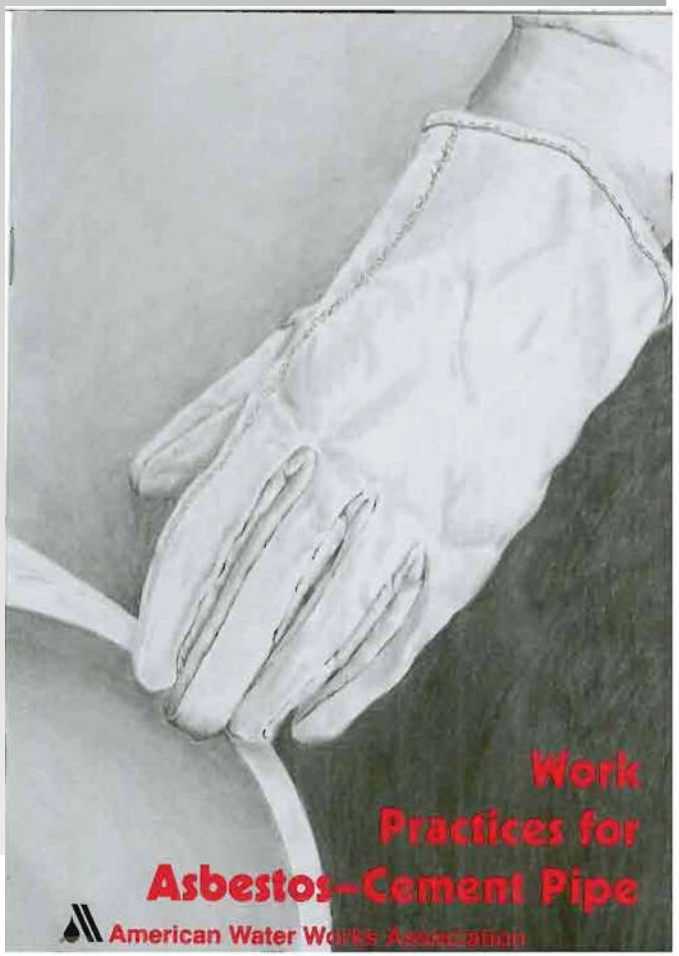
- Fire blankets and curtains
- Boiler insulation – US Navy
- Asbestos cement pipe

Amount of Installed AC pipe

- Estimates upwards of 630,000 miles of AC pipe installed in North America
  - Includes potable, force main and stormwater
- AWWA Buried No Longer doesn't clearly estimate amount of AC pipe but does estimate cost to rehabilitate
- Geographically focused in Southeast, Southwest
- Population growth rate can be utilized in combination with increase in use (1940-1970) to estimate service areas with greater quantities

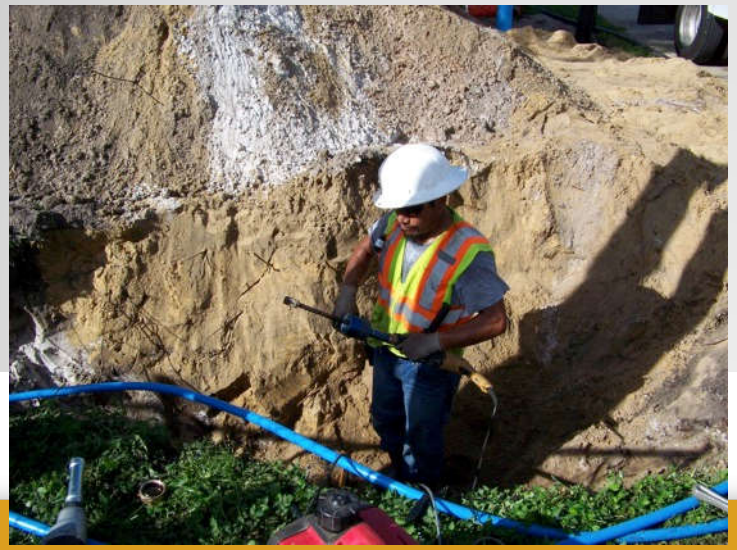
AWWA Work Practices for AC Pipe

- 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 recent pipe bursting projects in Boynton Beach, Florida performed an extensive Negative Exposure Assessment on the pipe bursting project
- Results indicated levels of asbestos ***under*** the limits set by OSHA



Is AC Pipe Friable After Bursting?

- *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

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))

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

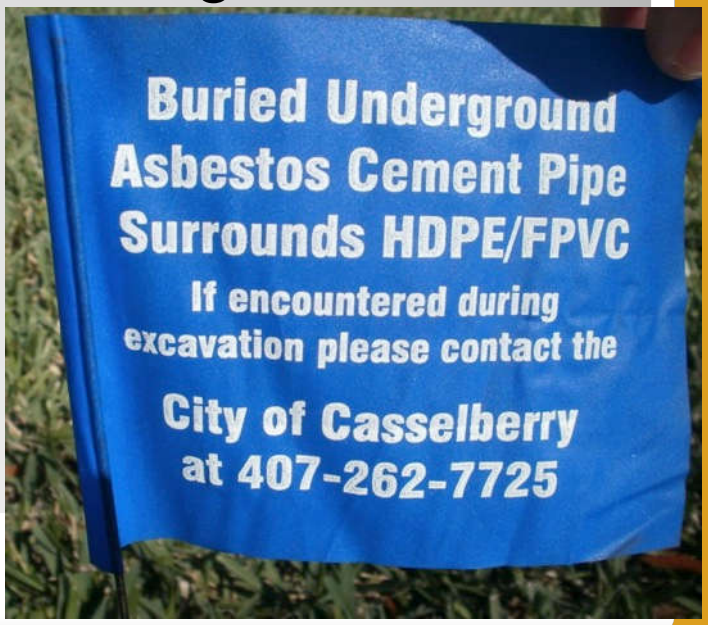
- Occur when other utility companies are required to perform work around remaining AC pipe fragments
- Utility companies will not perform extensive excavation within a few inches of the new HDPE pipe

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 Production Pipe

- 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*

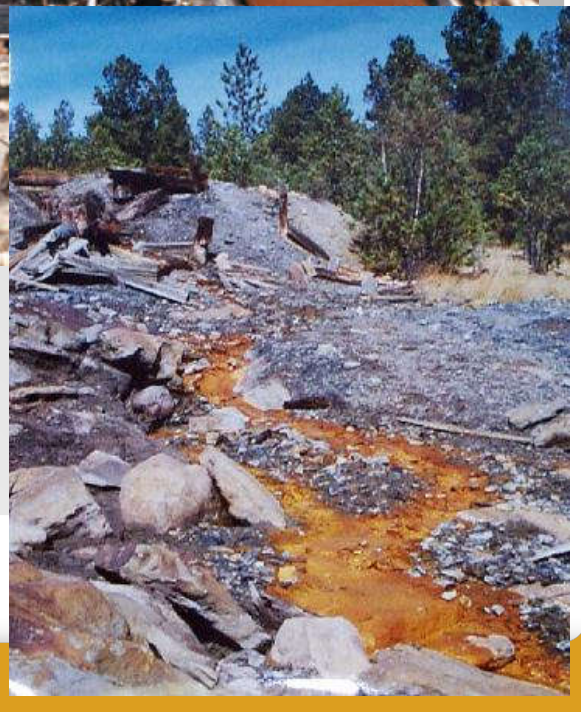
Resistance to AC Pipe Bursting

- 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 NESHAP

- 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

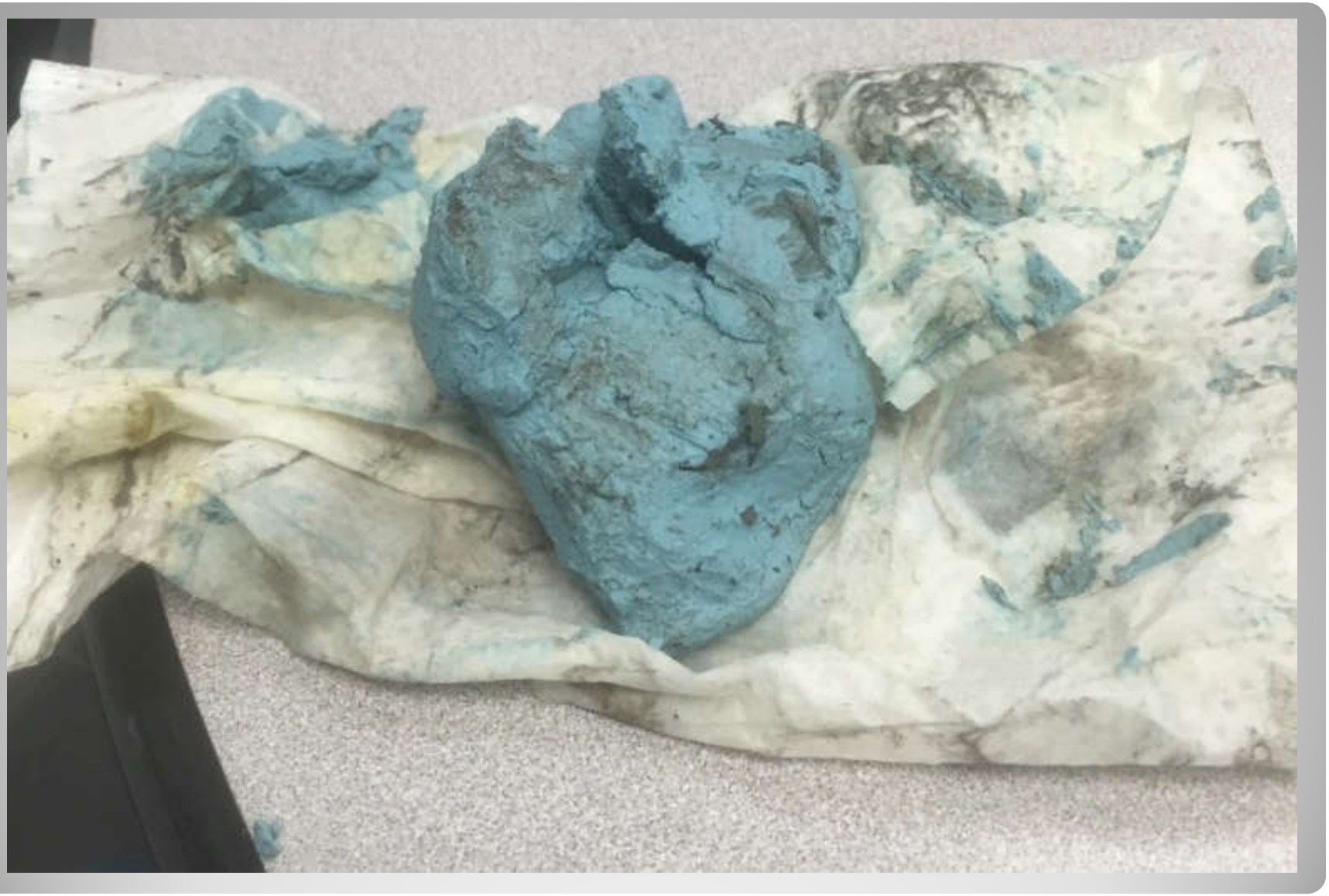
Resistance to AC Pipe Bursting
Active Hazardous Waste Sites



Resistance to AC Pipe Bursting
Pipe Bursting Sites

EncapsulAC

- Simple process and procedure added during pipe bursting activities
- Addition of a proprietary fluid that entombs remaining asbestos cement pipe fragments after pipe bursting
- Remaining coagulated mass is workable and does not harden like cement



EncapsulAC Negative Exposure Assessment

Recent successful installation of the encapsulation procedure

- Casselberry, Florida Dommerich Hills AC Pipe Bursting project
- City of Boynton Beach, Florida Tulip Tree Drive AC Pipe Bursting project

Negative Exposure Assessment at the Boynton Beach project yield no presence of asbestos fibers

Table I: Air Sampling Results

Sample ID and Location	Sample Time (min)	Concentration (f/cc)
1-Roberto Morales	237	0.036
2-Mikey Lopez	243	<0.006
3-Insertion Pit	239	<0.006
4-Machine Pit	240	<0.006
5-Background	239	<0.006

City of Boynton Beach AC Pipe Bursting with EncapsulAC

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- NESHAP allows for alternate procedure to be approved through EPA's Administrator
- EncapsulAC team submitted "Administrator Approved Alternate" for EPA's consideration in June 2016
- Team provided significant scientific data and case study information on AC pipe bursting and encapsulation
- EncapsulAC continues installations in Florida and case study documentation
- EPA staff visited the Wilton Manors pipe bursting with encapsulation project site mid November 2017 – overwhelmingly positive response
- EPA staff progressing through internal processes, expect 4-6 months from public commentary


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