



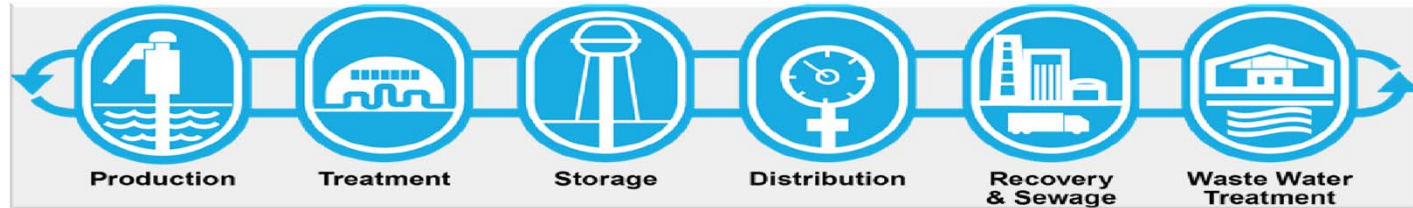
2014 PNWS-AWWA Conference

Distribution Leak Detection Technology Using Helium

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▶ Purpose

- To introduce an Innovative Helium Leak Detection Technology.

▶ Agenda

- Who is Utility Service Group?
- What are pipe future investment requirements for the US?
- What is helium leak detection?
- How does helium leak detection work?
- Case studies.
- Summary.

▶ Benefits:

- Provide you with an additional tool in your toolbox for maintaining your assets.





Utility Service Group

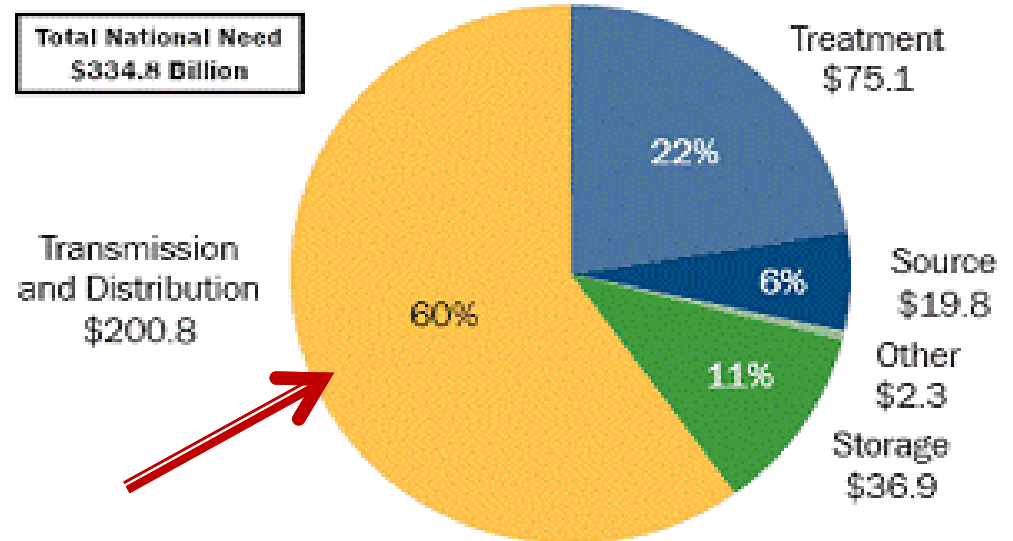
- ▶ Municipal Water Experts
- ▶ Celebrated our 50th Anniversary
- ▶ National Service Capability
- ▶ Focused on Asset Management and Preserving Water and Wastewater System Assets
- ▶ Distribution System Rehabilitation Services
- ▶ Solutions to Optimize CapEx & OpEx
- ▶ Unique business approach which combines AM principles, technology, funding and fixed payments



Pipeline Investment Requirements

- ▶ AWWA Buried No Longer Confronting Americas Infrastructure Challenge - \$1 Trillion Need
- ▶ American Society of Civil Engineers gives drinking water systems a D Grade
- ▶ America's drinking water systems face an annual shortfall of at least \$11 billion to replace aging facilities

Total 20-Year Need by Project Type (in billions of January 2007 dollars)



Note: Numbers may not total due to rounding.

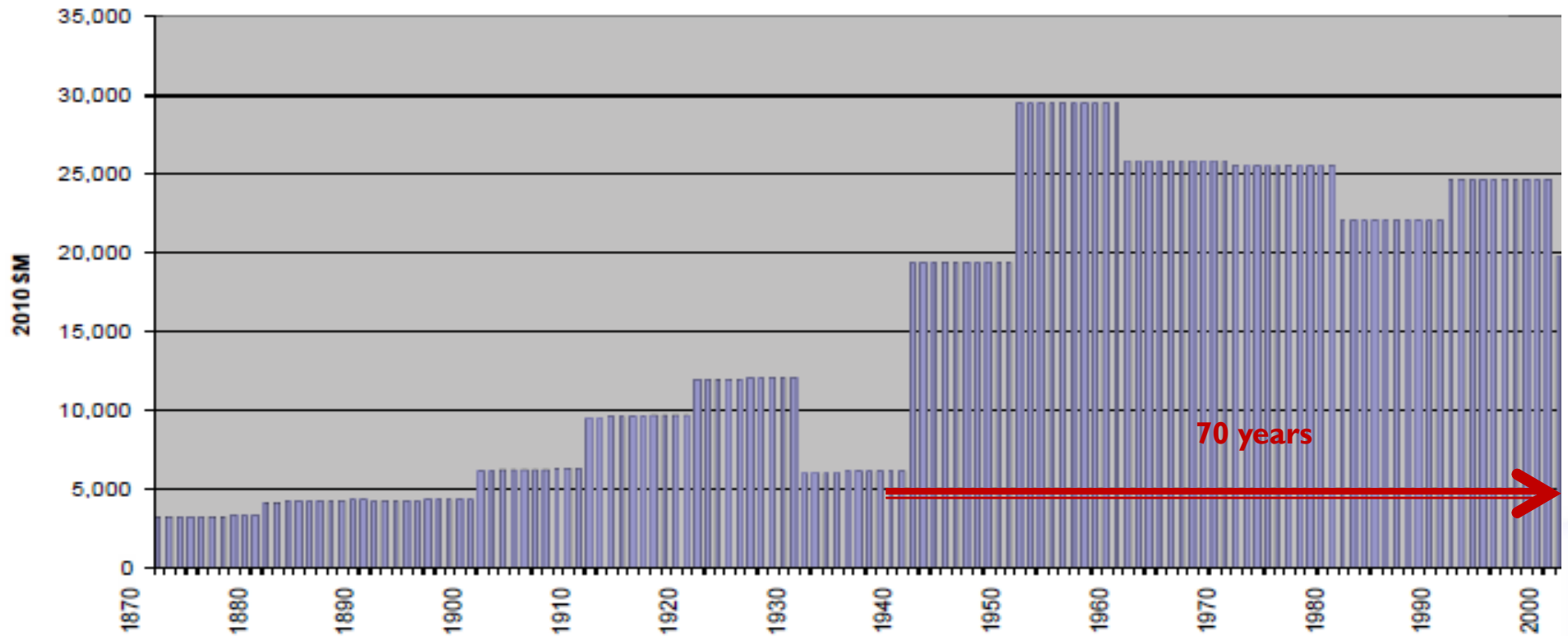
USEPA Drinking Water Needs Survey





Pipe Age

Estimated Aggregate Investment in US Water Mains (in millions of 2010 \$s)





Helium Leak Detection Features

- ▶ Deployed in 2007
- ▶ Helium injected into live water mains
- ▶ Particularly suited for plastic & large diameter pipes
- ▶ Can be used in challenging conditions
 - Long runs
 - Intermittent pressures
 - Difficult to locate leaks
- ▶ Injection can be used to pinpoint leaks for up to 5 days
- ▶ Internationally Patented





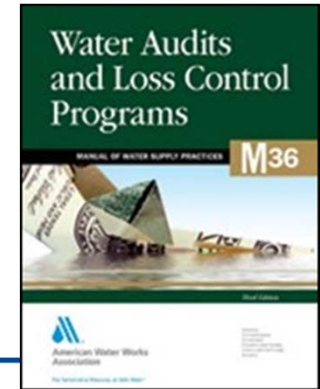
Helium Leak Detection Benefits

- ▶ Reliable and highly accurate
- ▶ Superior performance to alternate technologies
- ▶ Works in areas with few or very distant access points
- ▶ Minimally intrusive into the pipe network
- ▶ Not limited to water network geometry or configuration
- ▶ No need to construct a launch pit or device to inject the helium
- ▶ Quick and easy to deploy

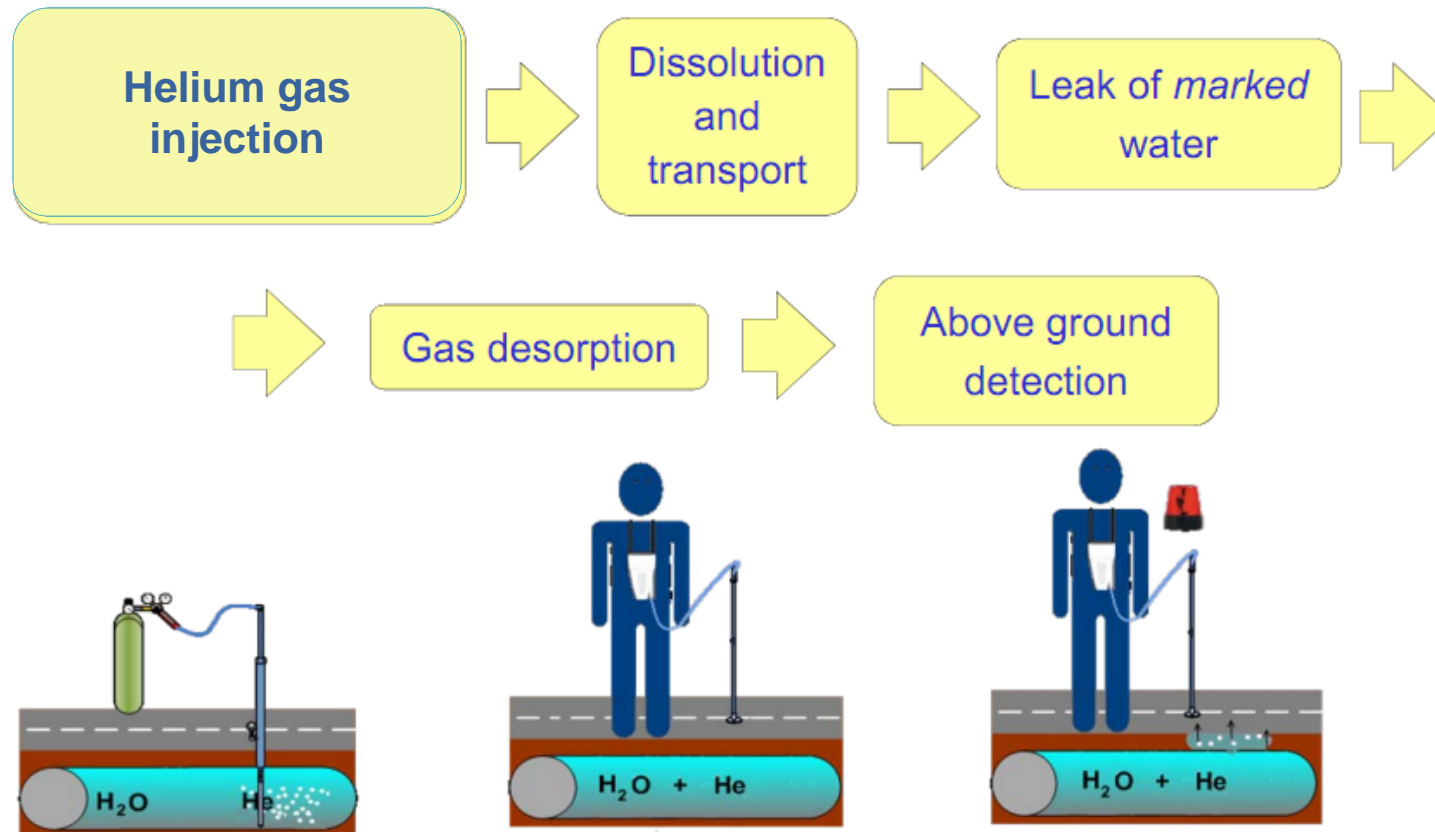




Principles of Helium LD



Tracer Gas method for pipes in operation





Helium - NSF Standard 60 Drinking Water Treatment Chemicals Certification

- ▶ Helium certified to 99.999% pure

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Facility : Madison, NC

Helium

Trade Designation	Product Function
Utility Service Company - Helium Series A	
Utility Service Company - Helium Series B	





Insertion / Injection of Helium

Patented Injection Process



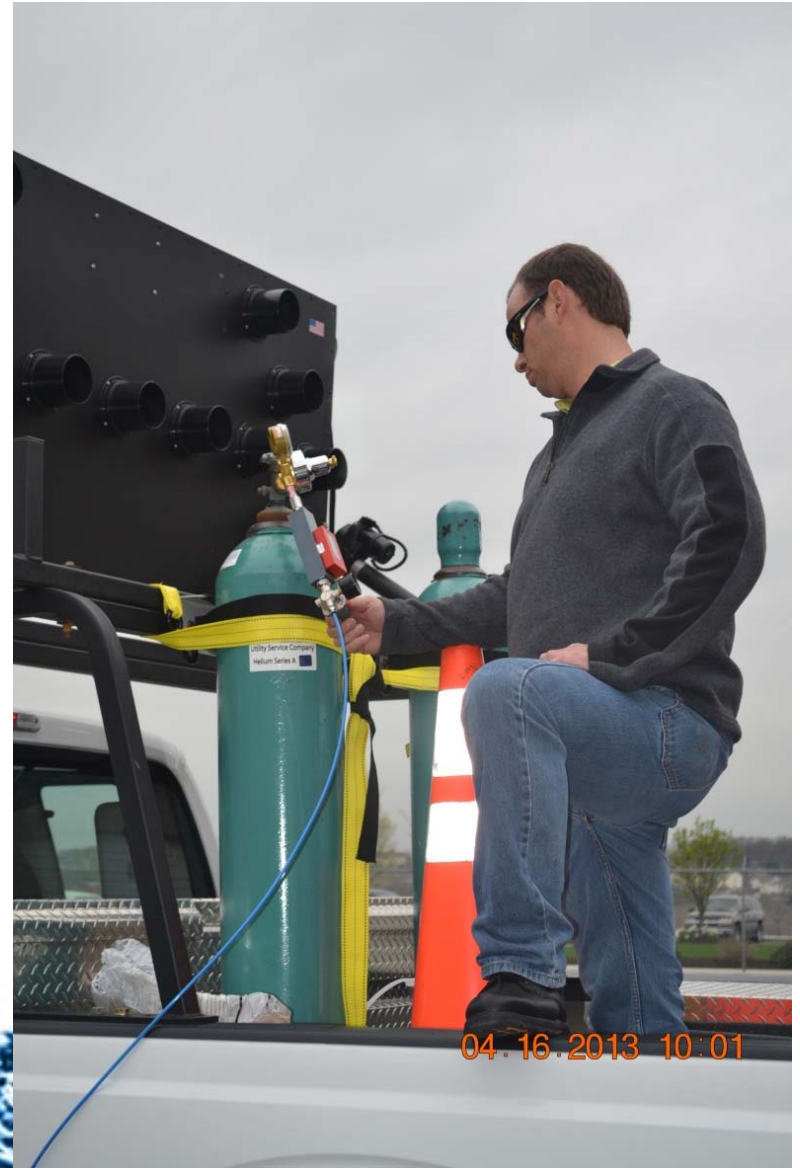
Injection through a standard 3/4 inch tap

Standard Injection Point





Helium Injection





Distributing the Helium Throughout the Desired Network Area

Sampling at a hydrant to insure helium distribution





Flowing Hydrants if Necessary

Helium Distribution Considerations

- Helium Injection Location
- Drawing Helium into the Network
- Dechlorination & Environmental Protection
- Traffic Control & Safety





Detection Process

- ▶ Fully automated cart
- ▶ Drilling
- ▶ Leak detection / pinpointing





Detection Process

Drilling / hand probe of small holes needed in non-porous surfaces



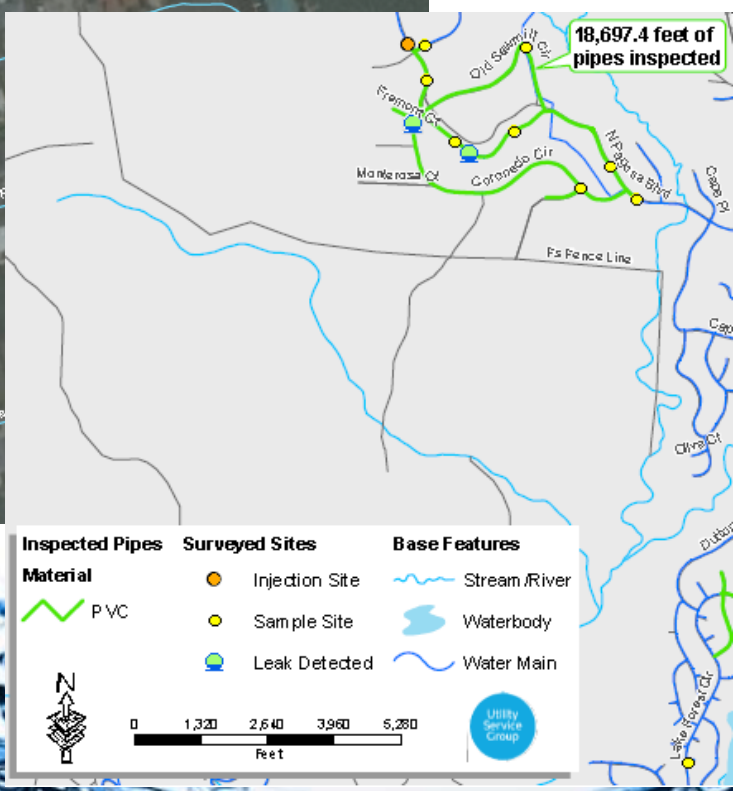
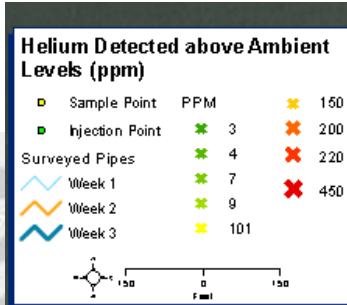
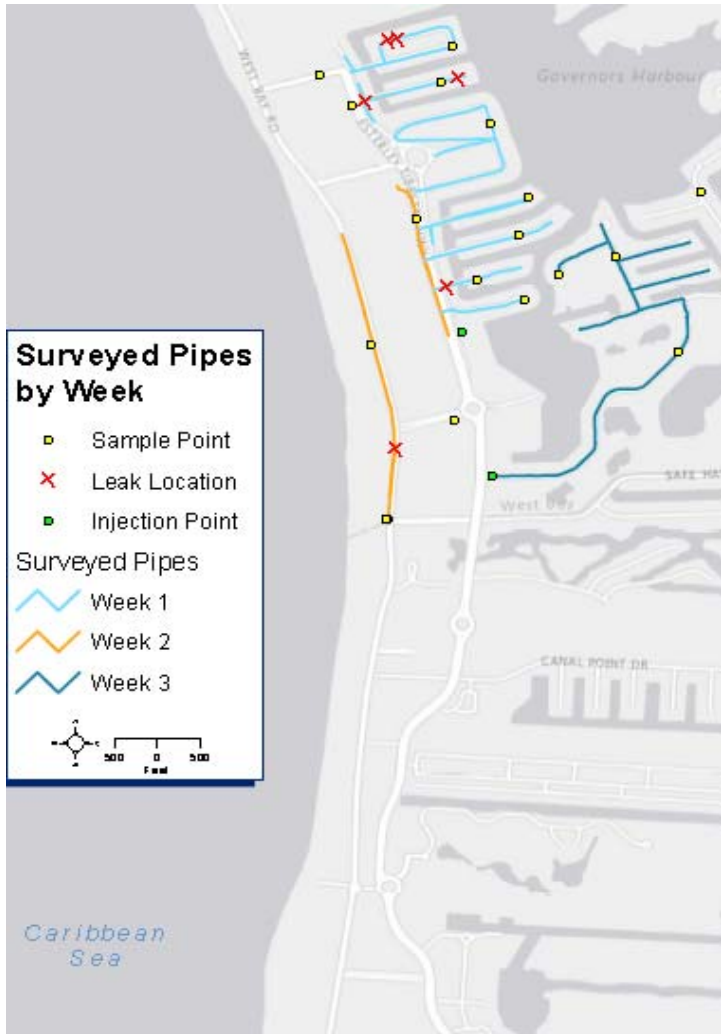


Plastic Pipe Leaks





Leak Survey Mapping

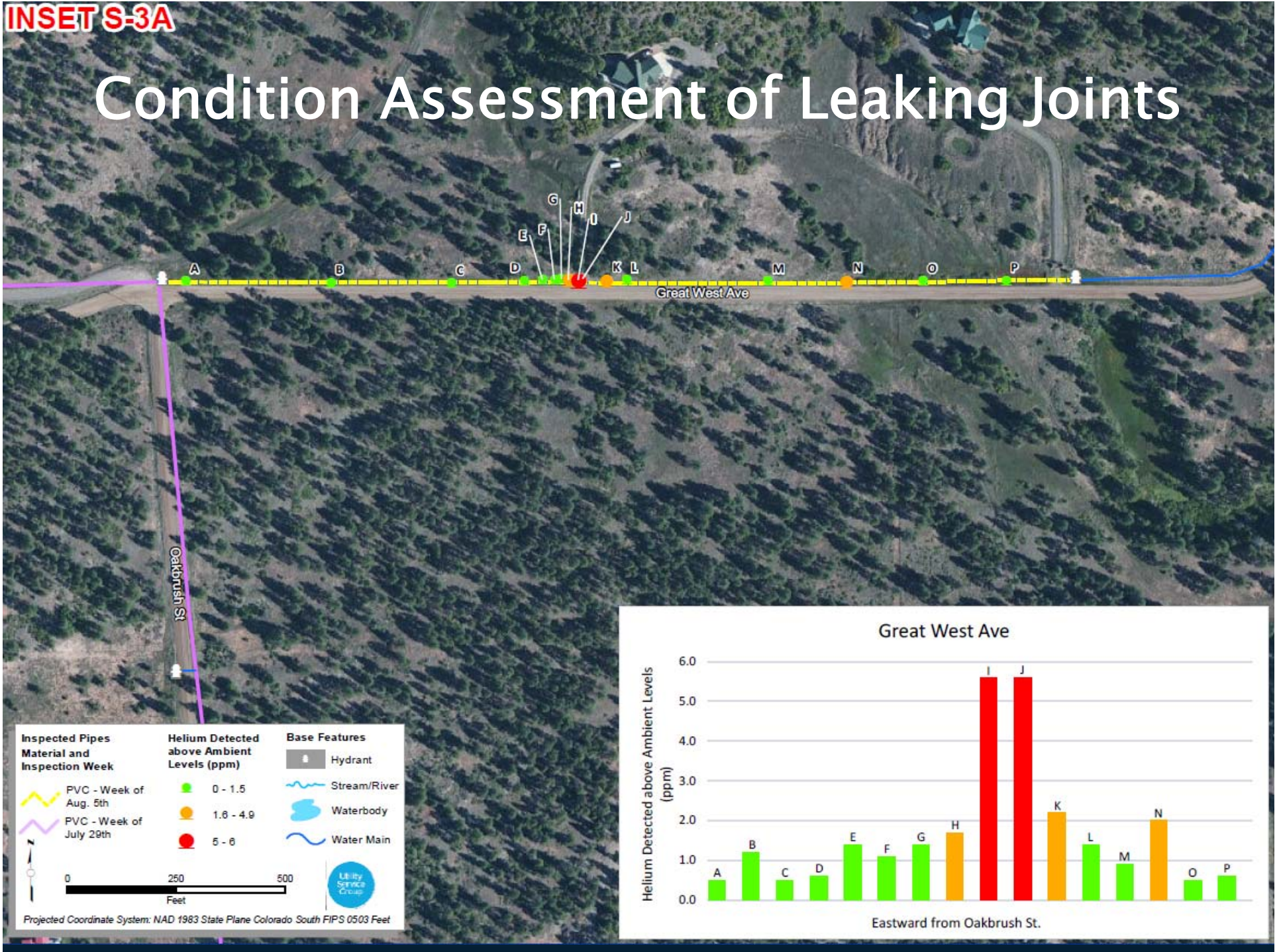


Surveyed Pipes

Date	Week/Day	Length (ft)
3/17/2014	day 2	978
3/17/2014	day 2	3,001
3/17/2014	day 3	3,590
3/17/2014	day 3	2,610
3/17/2014	day 4	4,406
3/17/2014	day 5	3,447
3/17/2014	day 5	252
3/17/2014	day 4	214
3/17/2014	day 5	2,448
Subtotal		15,234

INSET S-3A

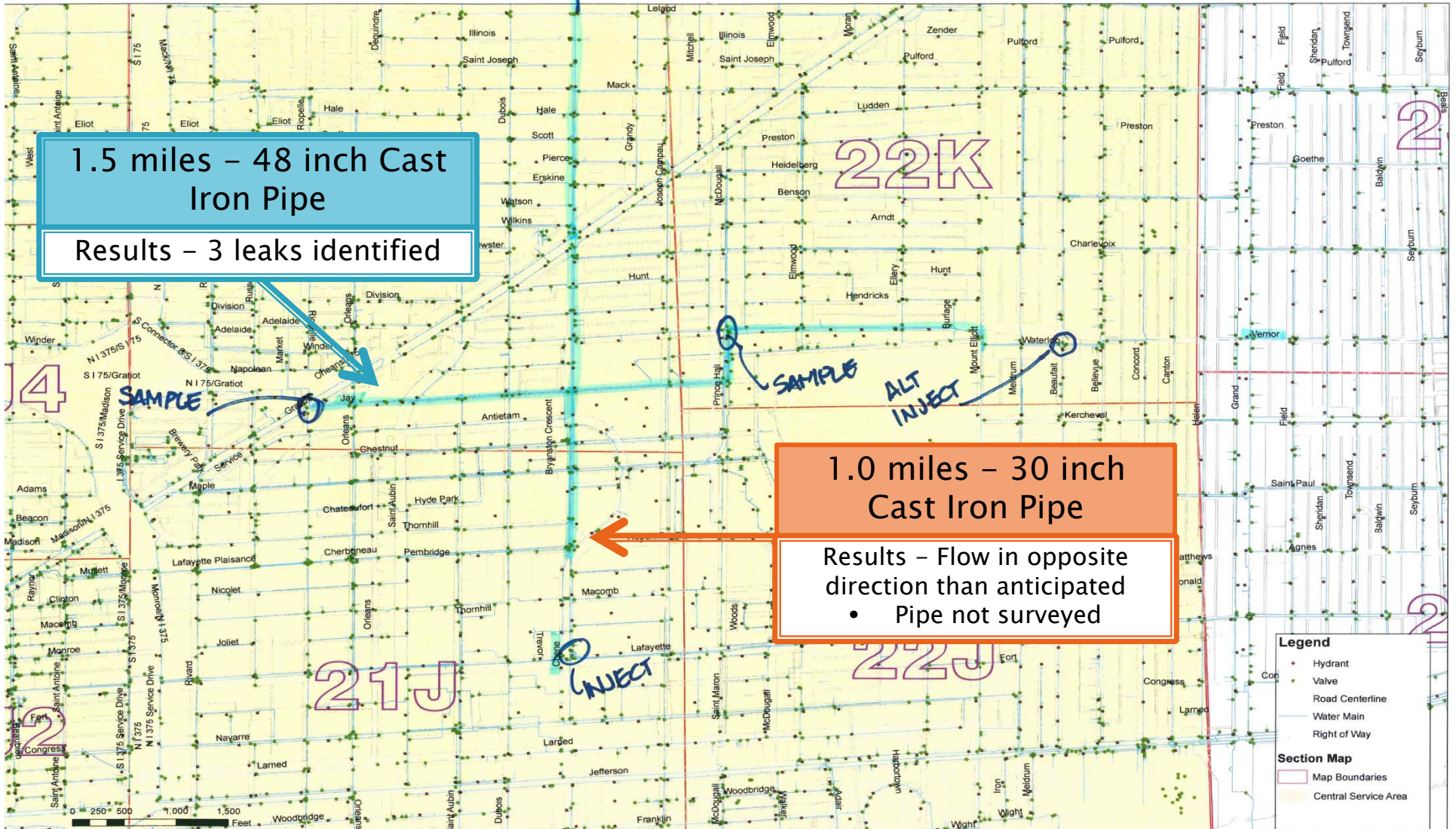
Condition Assessment of Leaking Joints





Detroit - 48" and 30" Cast Iron Transmission Mains – 100 Year Old Water System

CAN FIELD SAMPLE
DWSD Water Section Maps





Work Conditions





Detroit Project Challenges

- ▶ Drilling in paved roadways up to 36 inches in depth
 - Multiple layers of pavement including blacktop, cement concrete and brick
- ▶ Locating of century old pipelines with old mapping
- ▶ Plumbing & connections – American / Canadian threads
- ▶ Deep wet vaults
- ▶ 30 inch transmission main flow direction
- ▶ Weather - Rain, sleet, cold conditions
- ▶ Traffic control





Case Study – Harrisburg, PA

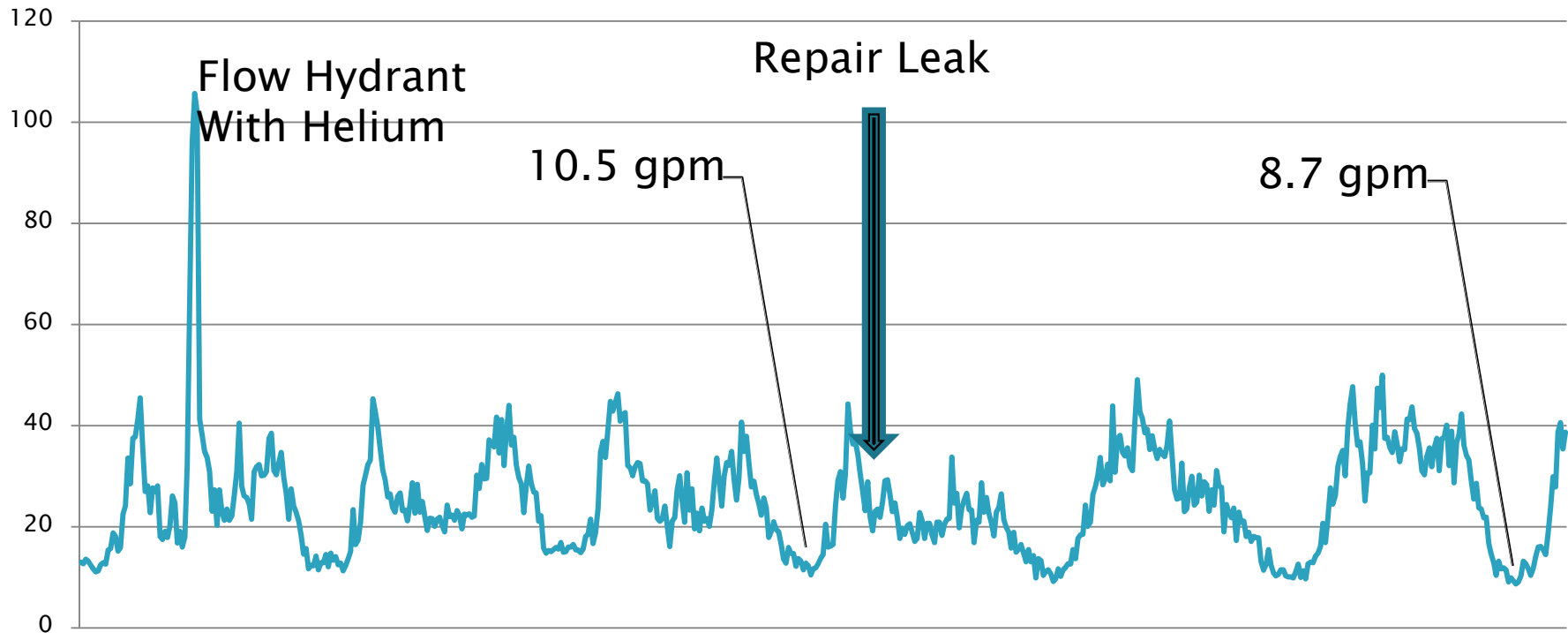


3/4" Service at 410 Pleasantview replaced on April 19, 2013



Repair & Results

President's Drive Flow (Gal/min)



President's Drive DMA	4/13/13 - 4/19/13	4/19/13 - 4/22/13
Minimum Daily Flow	34,888 gpd	30,894 gpd





Summary

- ▶ Injected in “live” fully operable water system with no impact on operations
- ▶ Effective on all pipe sizes and materials
- ▶ Not limited by “noise” or electrical interference, or to system geometry or length of pipe(s)
- ▶ Less intrusive than other technologies
- ▶ Fast to implement (especially in relation to other tests in large pipes)
- ▶ Works in areas with few or very distant access point





Thank you for your time. Any questions?

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