

# Non-Invasive Condition Assessment of Asbestos Cement Mains

**brabant Water**



## The Challenge of Aging Asbestos Cement Mains

Asbestos Cement (AC) water mains were widely installed across Europe and North America in the mid-20th century. Over time, these pipes have proven challenging to assess due to their unique failure modes and material composition.

AC pipes degrade through the leaching of cement, which weakens structural integrity. Traditional inspection methods often require full depressurization, excavation, insertion of inline tools or destructive sampling, making them costly and operationally disruptive.

Utilities have long sought a practical, non-invasive approach to evaluate the condition of these assets without removing them from service. Yet few technologies have been able to reliably detect localized structural deterioration in AC mains while balancing accuracy, ease of deployment, and cost-efficiency.

## Brabant Water's Inspection Challenge

Brabant Water, a leading Dutch drinking water utility, needed to better understand the condition of its aging AC transmission network. One key section—a 700-meter length of 300mm AC pipe—had previously been inspected using high-resolution inline Ultrasonic Testing (UT), but the utility was searching for a more scalable and less invasive solution that could be operated by in-house crews.

To identify suitable technologies, Brabant Water partnered with Isle Utilities for a Technology Horizon Scan. Among the shortlisted solutions, KenWave's Dynamic Response Imaging™ (DRI™) emerged as a promising candidate.

## The KenWave Solution

DRI is an external, non-invasive inspection method that assesses pipelines while they remain in service. It works by analyzing dynamic vibrational responses along the pipeline, using this data to infer localized structural stiffness and effective wall thickness.

To trial DRI, KenWave and Brabant Water joined forces under Isle Utilities' Trial Reservoir Program—a funding model that de-risks adoption by linking vendor repayment to performance-based KPIs. The objective: compare DRI results with prior UT data and determine if the method could provide accurate, actionable insights at a lower operational burden.

The trial was designed using two access point configurations:

- Scenario 1: Access points every 100 meters (target resolution: 2–3m)
- Scenario 2: Access points every 300 meters (target resolution: ~20m)

Brabant Water deployed a novel temporary potholing technique to overcome high groundwater conditions and complete the inspection with minimal impact to farmland.





## Results

KenWave performed quality control during fieldwork to ensure data integrity and detect potential leaks. Afterward, DRI results were analyzed against UT benchmarks<sup>1</sup>, with adjustments for AC pipe characteristics. The results met or exceeded all performance targets, confirming DRI's accuracy and reliability.

### Scenario 1 (100m spacing):

- $\pm 6\%$  accuracy across 83% of pipe length (target 80%)
- $\pm 10\%$  accuracy across 98% of pipe length (target 90%)
- 100% compliance at  $\pm 15\%$  and  $\pm 20\%$  thresholds

### Scenario 2 (300m spacing):

- $\pm 10\%$  accuracy across 99.6% of pipe length
- 100% compliance at broader thresholds

The findings validated that even with fewer access points, DRI could deliver a sufficiently accurate assessment of AC pipe condition, confirming its scalability and reliability.

## The Road Ahead

With Phase 1 of the trial complete, Brabant Water and KenWave are advancing to Phase 2: training utility staff to independently deploy DRI™ across additional segments, with further inspections planned for Fall 2025.

This project also underscores the success of Isle Utilities' Trial Reservoir program—a structured innovation model that connected a utility with a pressing infrastructure challenge to a vendor offering a novel, scalable solution. By mitigating financial risk and aligning adoption with performance, the program created a clear path from trial to implementation.

More broadly, the case demonstrates the potential of Dynamic Response Imaging to transform how utilities manage aging AC water mains. With its non-invasive deployment, operational uptime, and strong correlation to conventional inspection data, DRI equips utilities with actionable insights to guide investment decisions and extend the life of critical assets—without digging up a single pipe.

Contact KenWave to learn how Dynamic Response Imaging can help your utility manage aging pipeline assets without disruption.

[www.kenwavesolutions.com](http://www.kenwavesolutions.com)

### KenWave Solutions Inc.

7080 Derrycrest Dr  
Mississauga, ON, Canada  
L5W 0E5  
+1 888-978-9283  
[info@kenwavesolutions.com](mailto:info@kenwavesolutions.com)



<sup>1</sup> Benchmarks refer to the minimum circumferential UT thickness values, averaged over the DRI resolution length