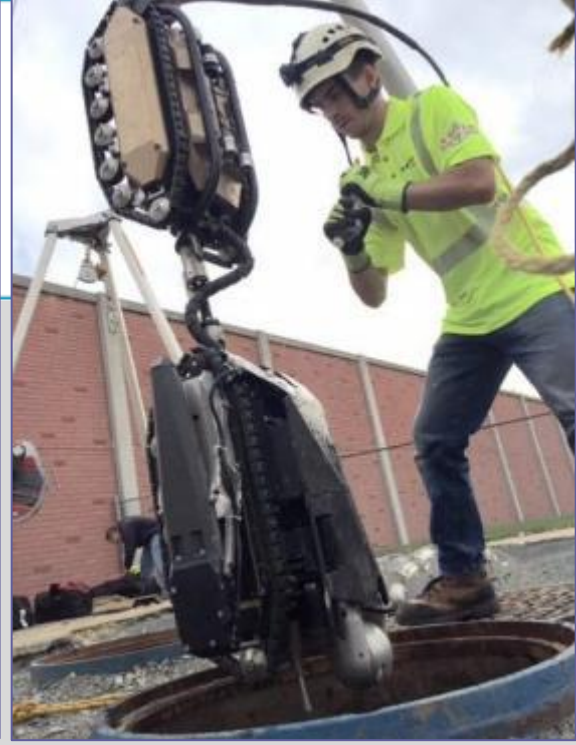
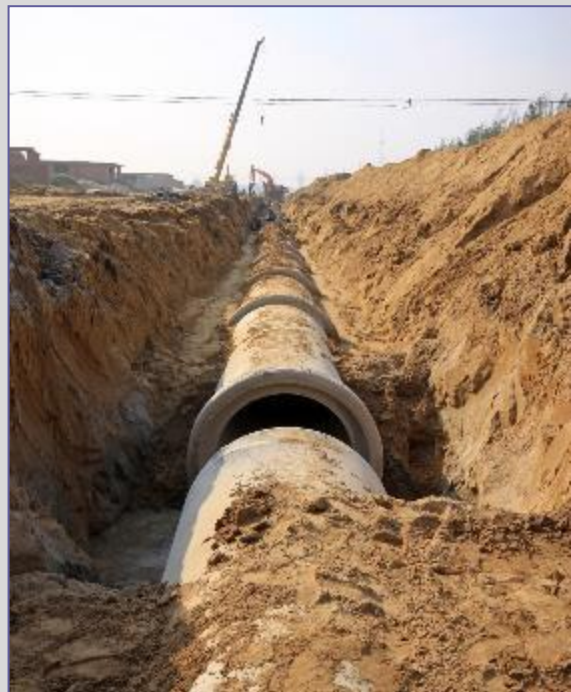
xylem
Let's Solve Water

Managing Large Diameter Pipelines

A proactive approach





ING. MICHAL SKALICKÝ
SALES ENGINEER, XYLEM

WATER LOSS FORUM
SEPTEMBER 1, 2023

By the Numbers: Xylem's Pipeline & Valve Assessment Experience

PIPELINE MONITORING

1,340+
Kilometers of Pipeline Monitored

450+
Pipe Interventions* (2017-Present)

LEAK DETECTION

18,550+
Kilometers of Pipeline Inspected for Leaks

8,600+
Leaks Detected

PIPE WALL INSPECTION

9,110+
Kilometers of Pipe Wall Inspected

1.87M pipes inspected for pipe wall degradation

Pipes in Good Condition

VALVE ASSESSMENT

1.39M
Valve Inspections Performed

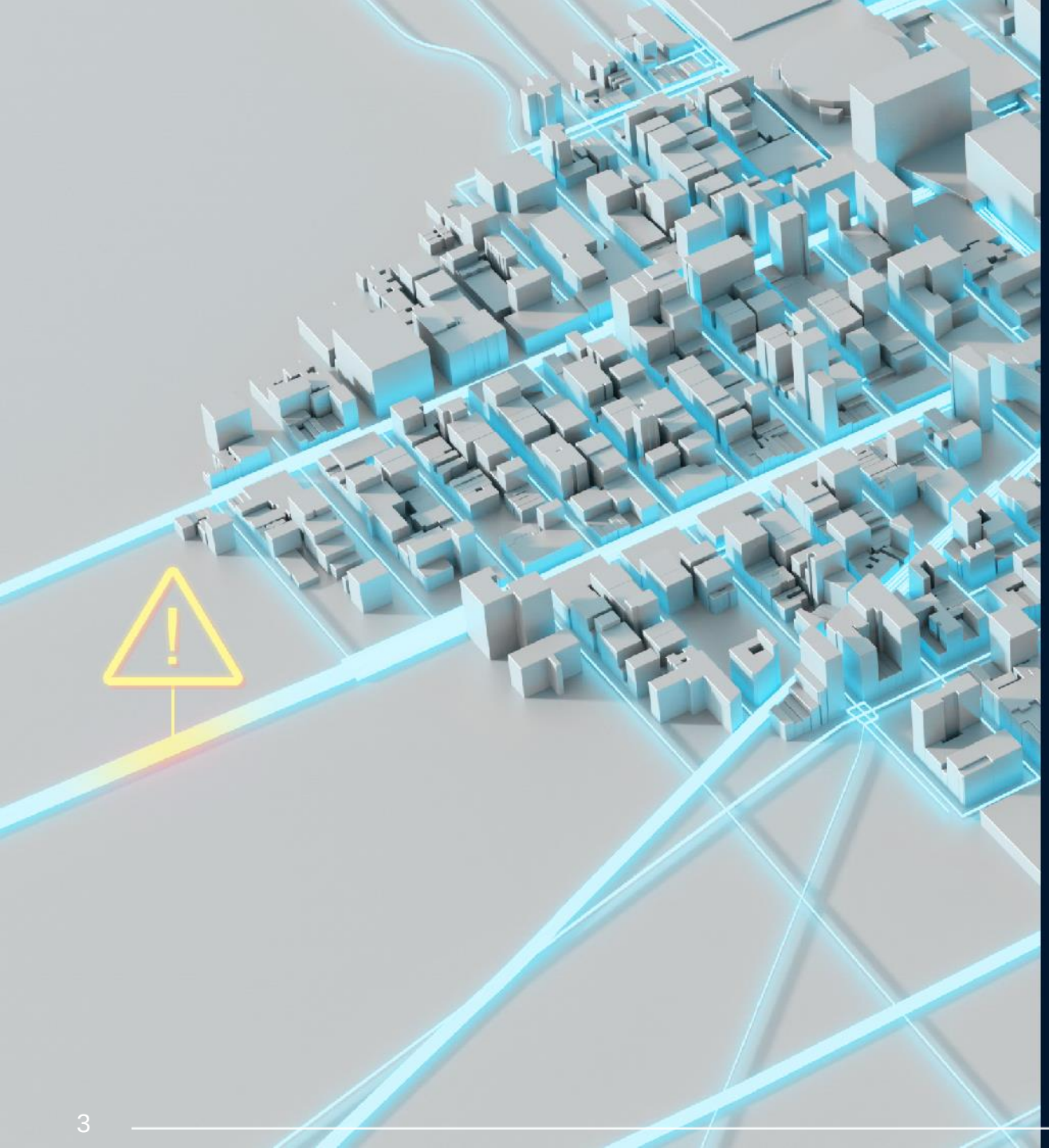
65,000+
Large Valves Serviced

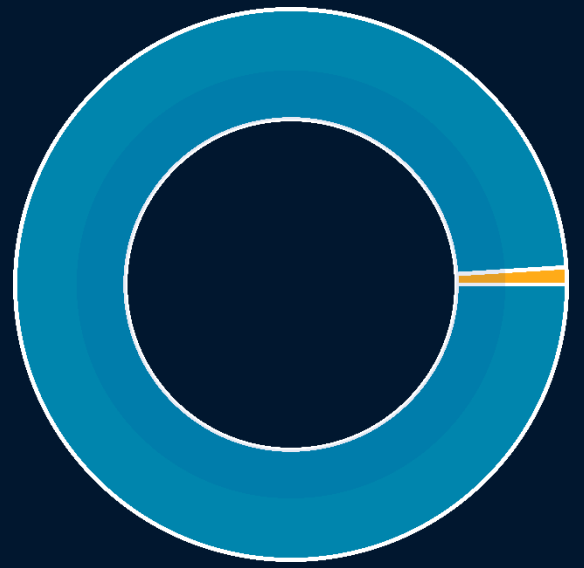
30+
Years of Experience

48
Countries Where We Have Worked

*The utility made a proactive repair based on monitoring data.

xylem



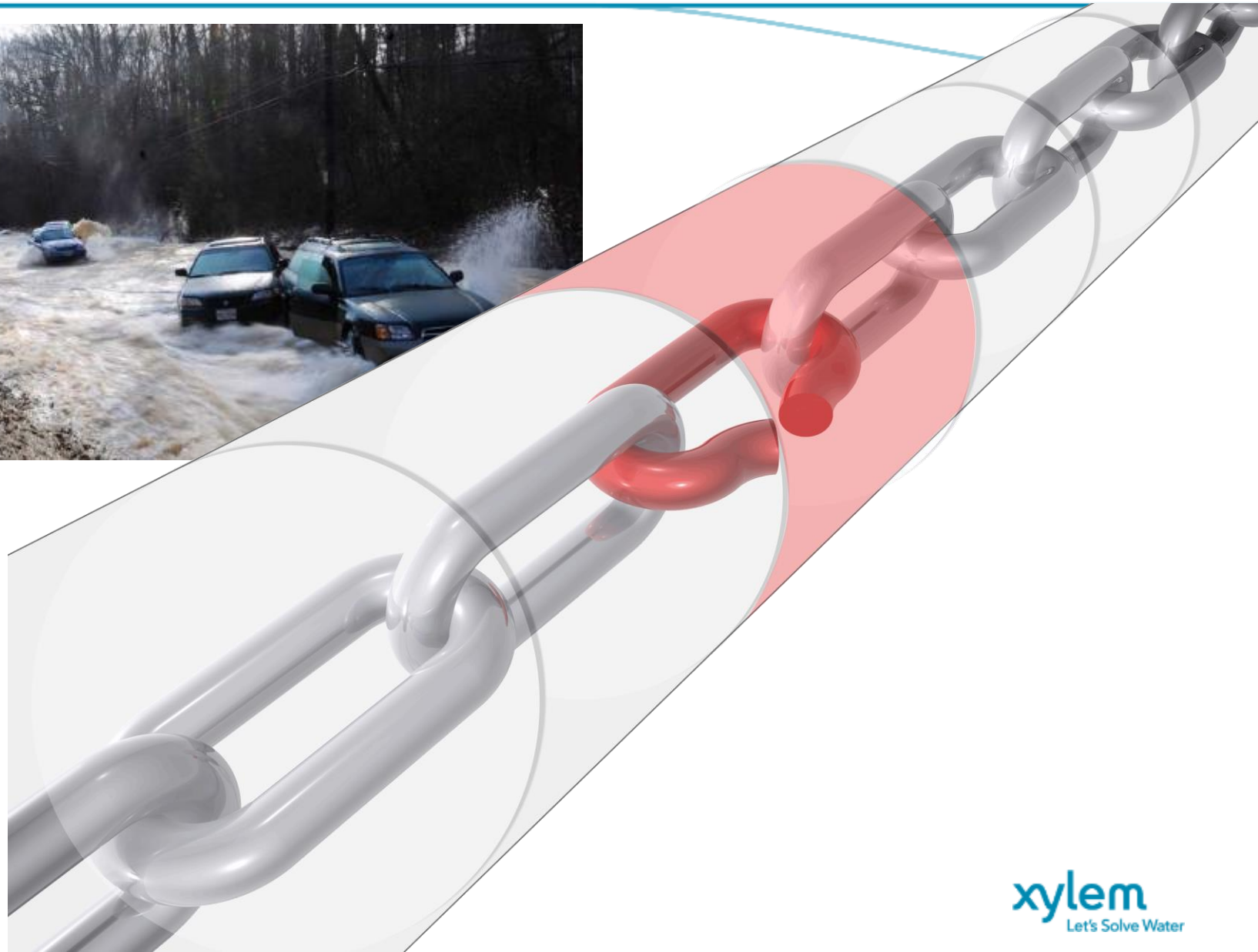


1%

OF PIPES NEED
IMMEDIATE ATTENTION

Key Financial Benefits of proactive Pipeline Management

1. **Avoid Failures**
2. **Reduce Risk**
3. **Extend Asset Life**



xylem
Let's Solve Water

Key Financial Benefits – Avoid Failures

- Emergency Repairs

- Property damage
- Environmental damage
- Cleanup and remediation

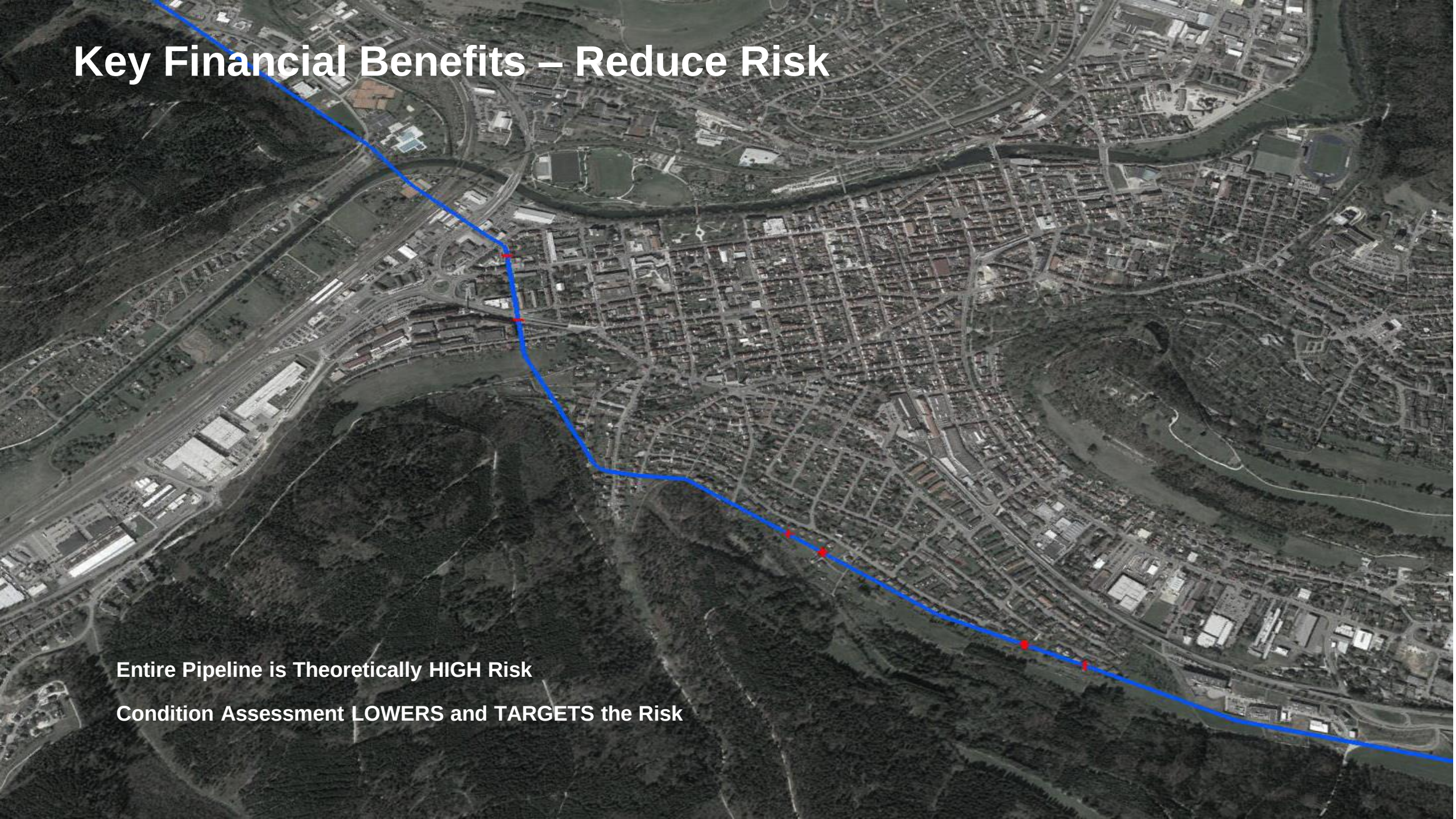
- Effects on human health
- Loss of production

- Litigation
- Contract violations

- Customer dissatisfaction
- Political / Media reaction
- Government fines and penalties

xylem
Let's Solve Water

Key Financial Benefits – Reduce Risk



Entire Pipeline is Theoretically HIGH Risk

Condition Assessment LOWERS and TARGETS the Risk

Return on Investment for Condition Assessment

- Assessment & Repair for less than 10% of replacement value
- Defer CAPEX cost based on assessed condition and repair
- The cost of one pipe burst is usually more expensive than proactive inspection of the entire pipe length
- ROI for our SmartBall leak detection service can be as short as 3 months
- Reduce customer service complaints due to leaks/bursts

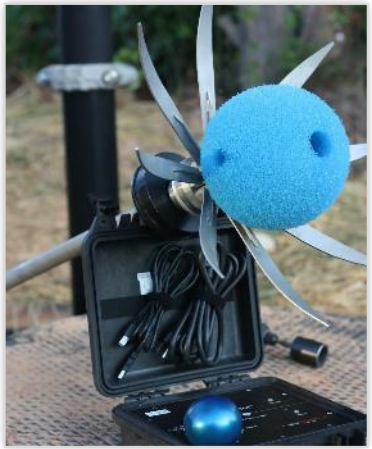
xylem
Let's Solve Water

So what can we do?

Understanding failure mode

xylem
Let's Solve Water

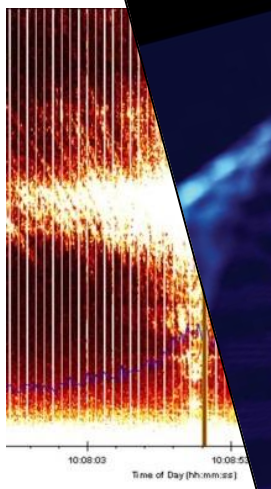
Use **Proven** Technologies and Manage Your Pipelines



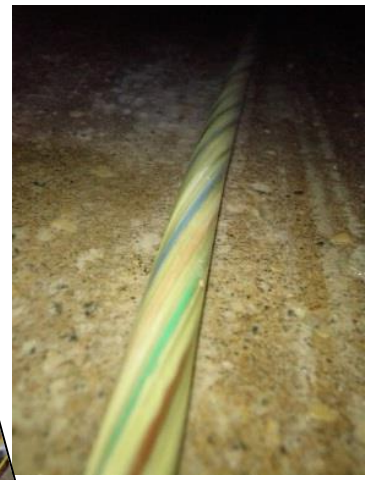
xylem
Let's Solve Water

Established Best Practices for PCCP Management

1. Det… e information on the
2. C… pipe segment

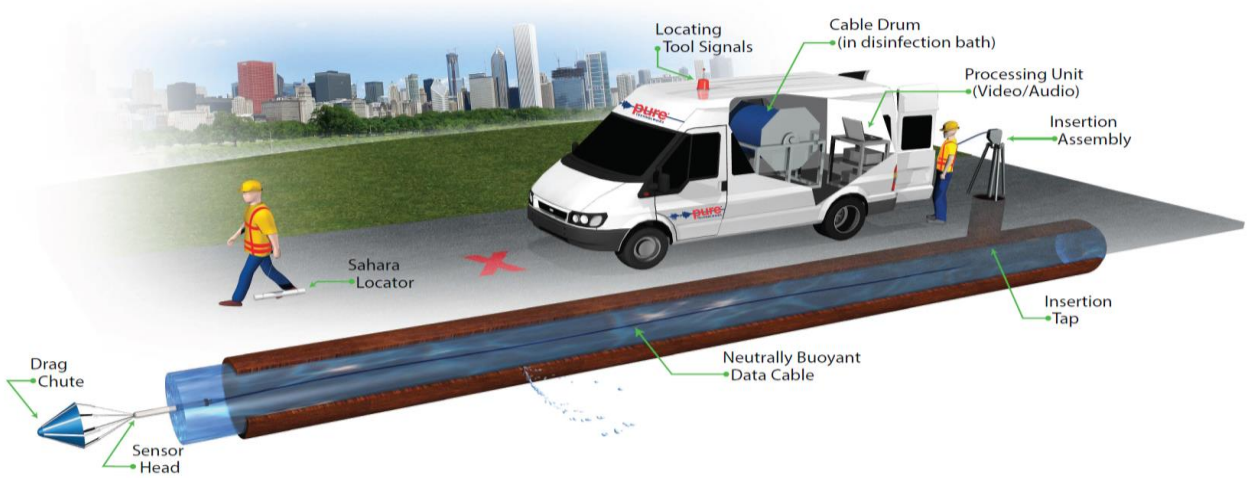


Leak Detecti…



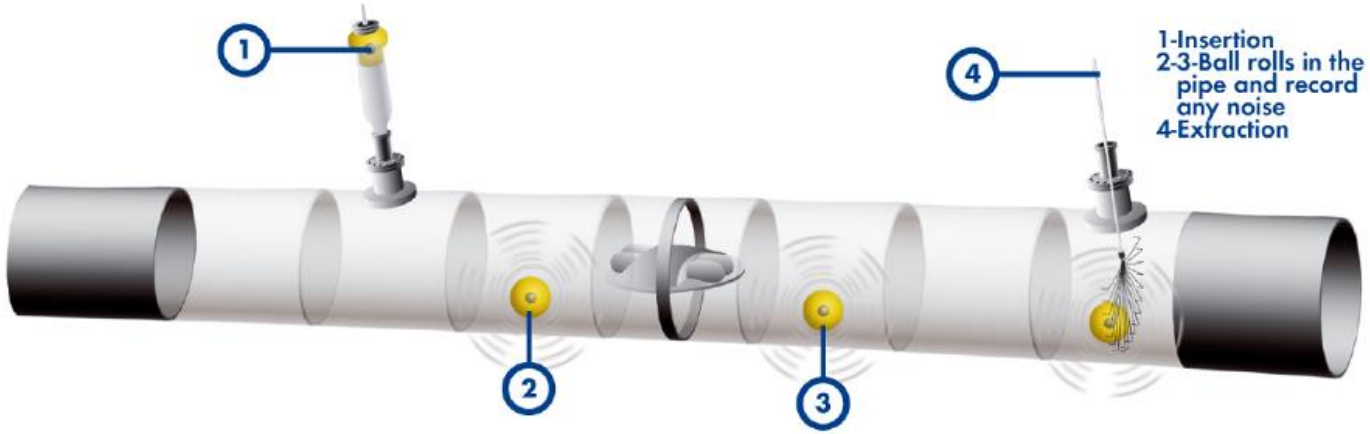
AFO Monitoring

Inline Leak Detection Platforms for Large Diameter Pipes



Sahara® System

- Tethered leak detection with CCTV
- Ideal for complex networks
- Worldwide since 1999



SmartBall® System

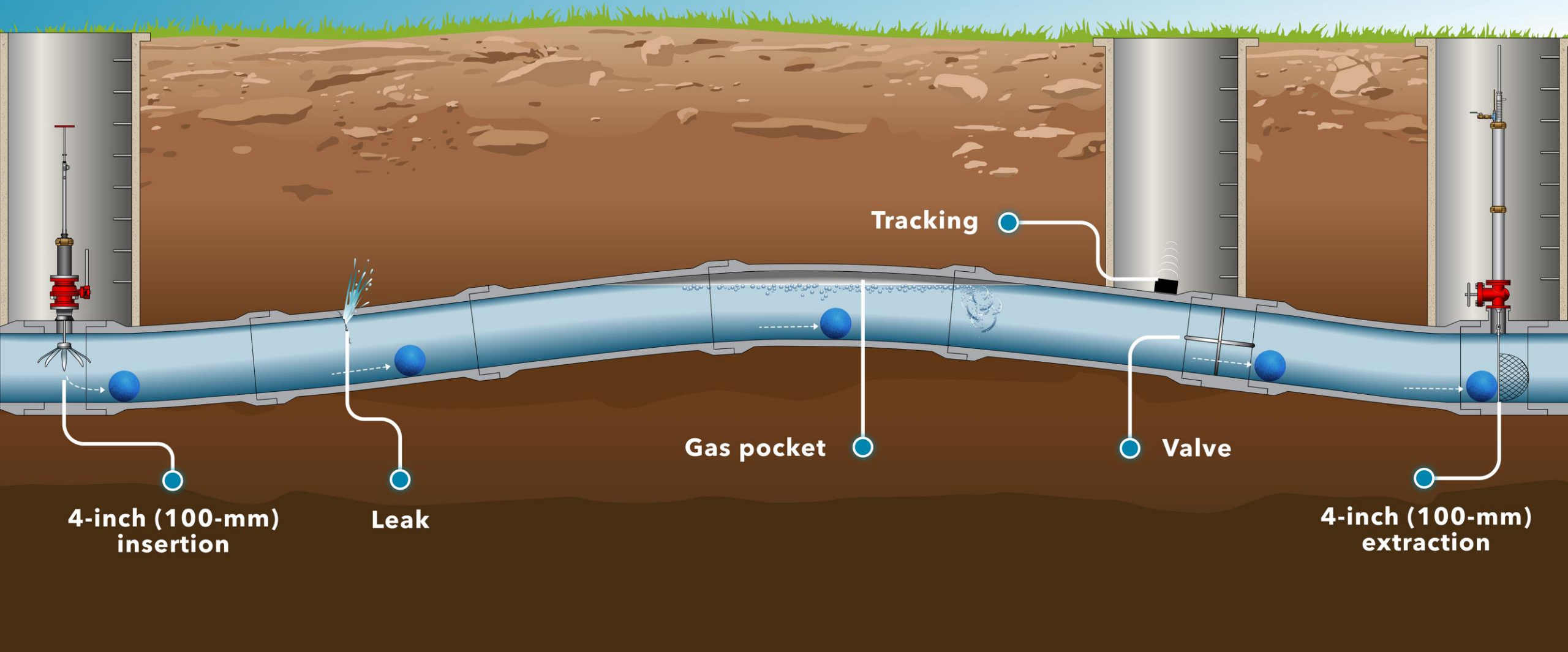
- Free swimming system
- Ideal for long transmission mains
- Worldwide since 2005

xylem
Let's Solve Water

SmartBall®

Free-Swimming Inspection Platform for Leak and Gas Pocket Detection and Pipeline Mapping

xylem
Let's Solve Water



SmartBall M

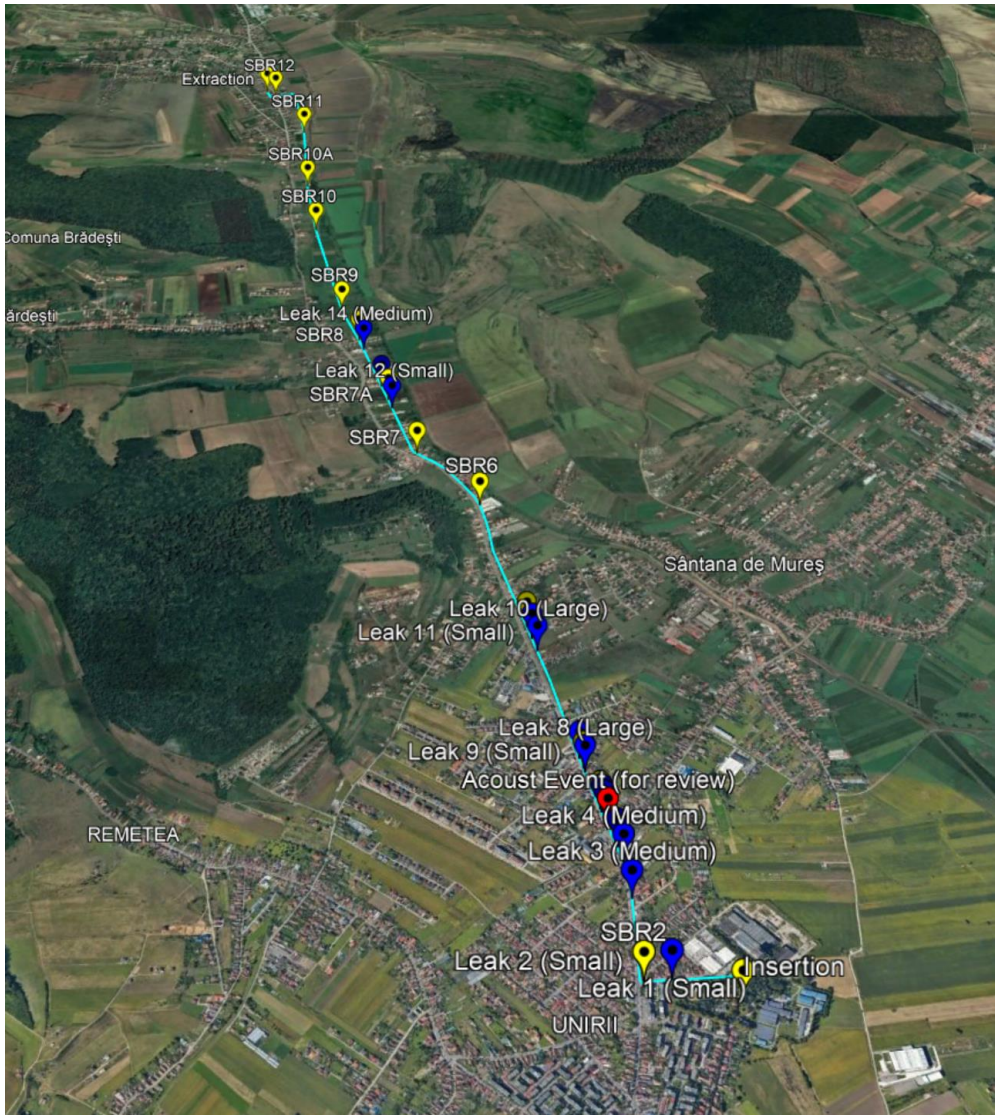
xylem
Let's Solve Water

1st SmartBall project in Romania

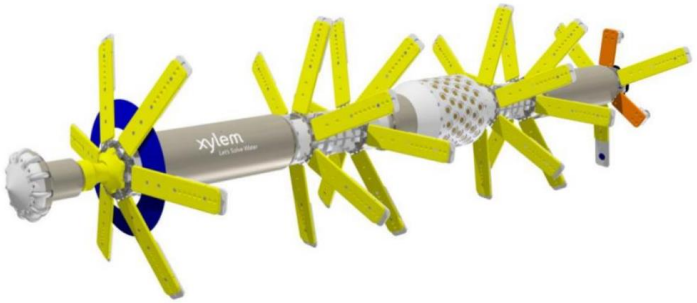
- Compania Aquaserv Targu Mures
- 6.15km long DN 400 Steel pipeline
- Insufficient flow
- Suspected blockage

xylem
Let's Solve Water

1st SmartBall project in Romania



Inline pipe wall condition assesment tools for large diameter pipes



PipeDiver® System

- Free-swimming inline tool
- Minimum disruption to service
- Concrete and metalic pipelines

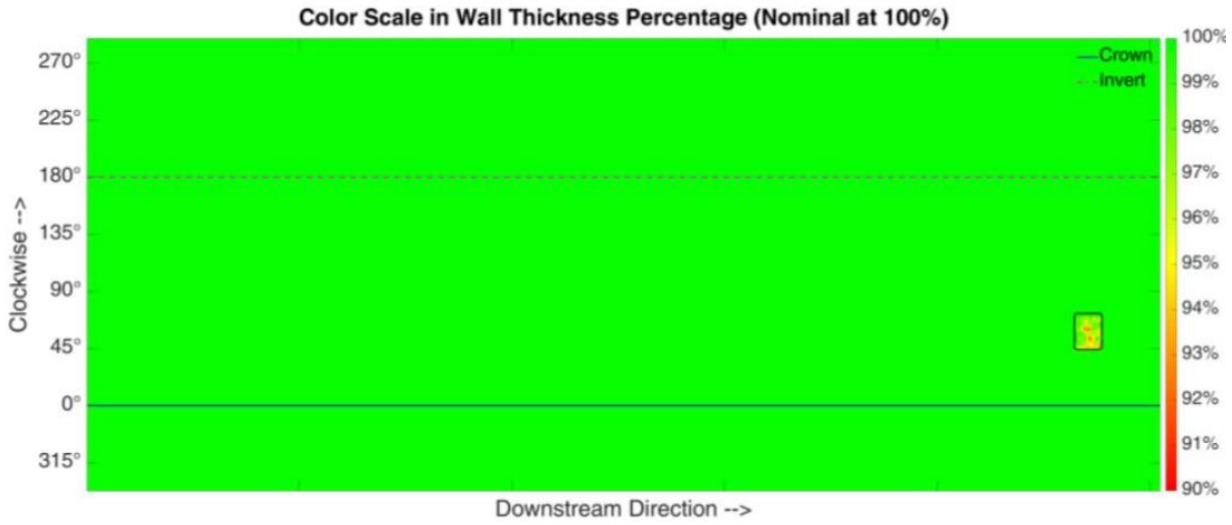
PipeWalker® System

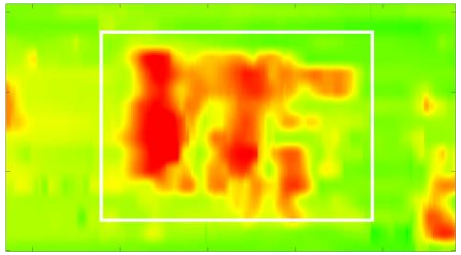
- Worker operated tool
- Dewatered and depressurized
- Concrete and metalic pipelines

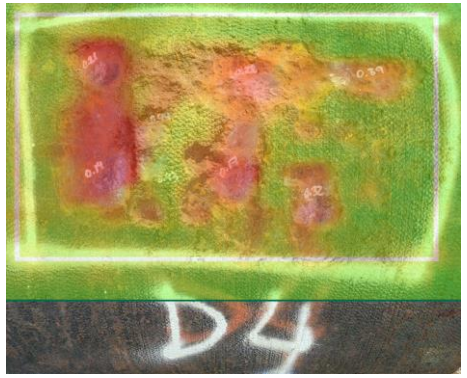
xylem
Let's Solve Water

PipeDiver Metalic Detection capabilities

- Detection of wall loss areas as small as 50x50mm with 20% material loss
- Up to 12 hours of inspection time on single insertion
- 360° onboard Camera recording of the Pressurized or depressurized insertion and extraction of the tool

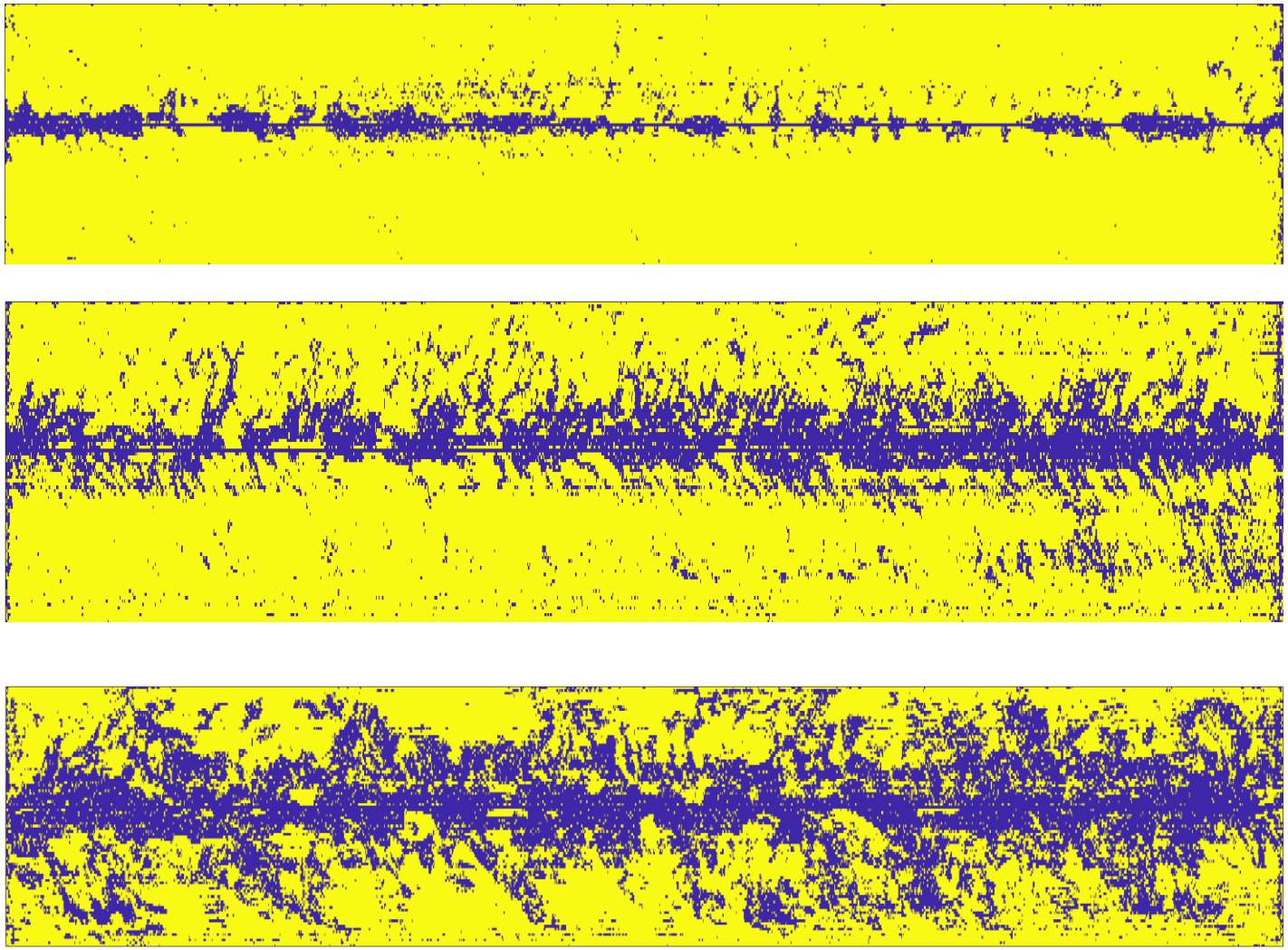


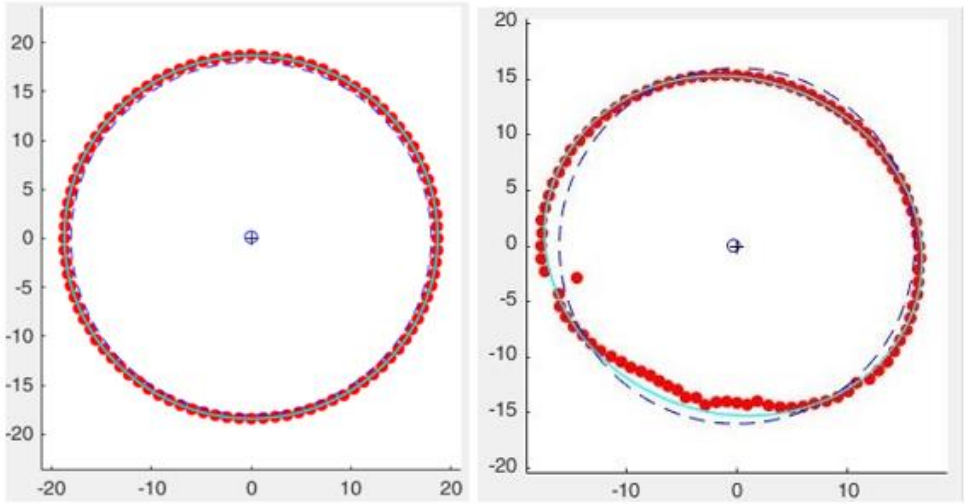




xylem
Let's Solve Water

PipeDiver Metalic Detection capabilities

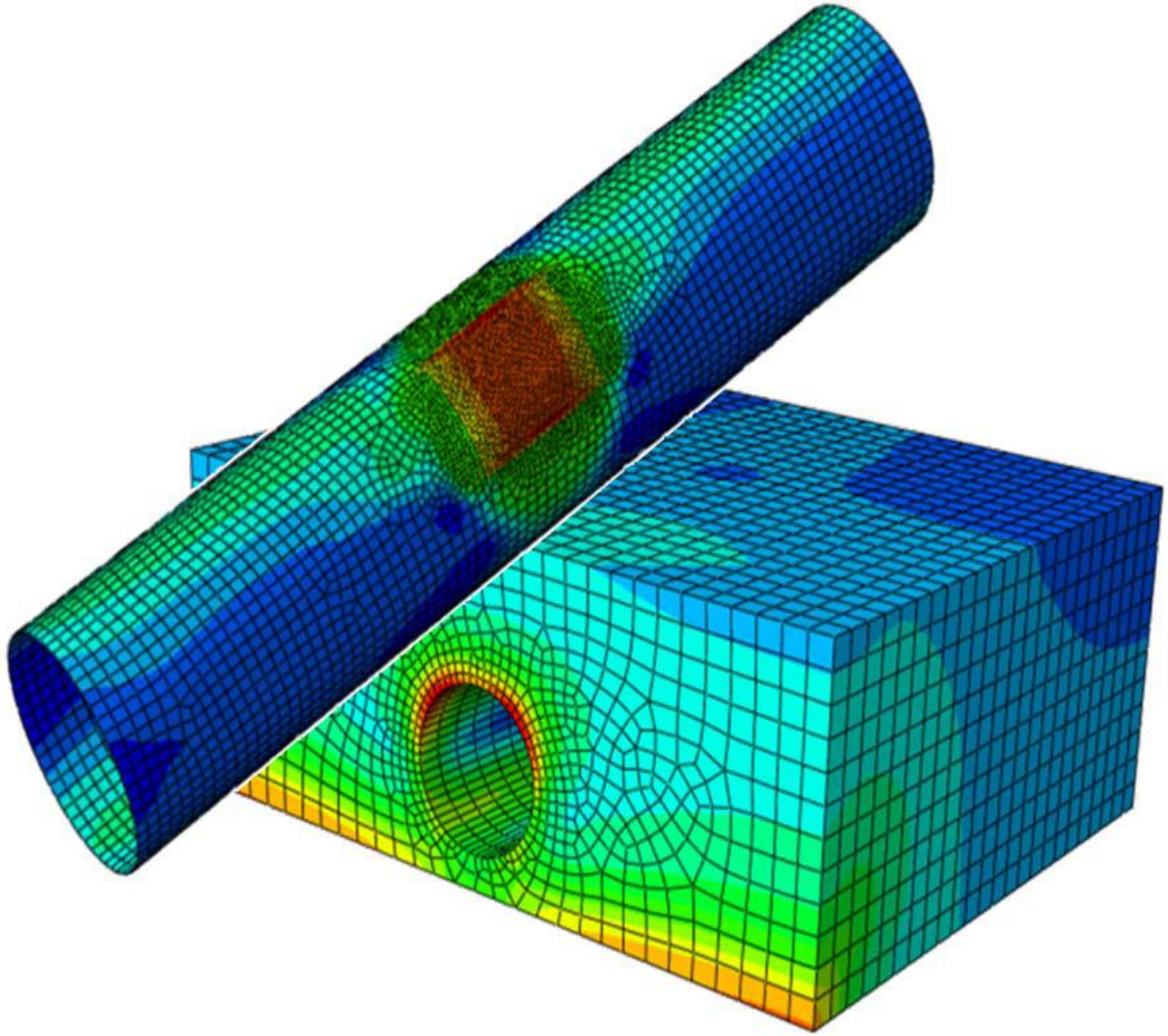




xylem
Let's Solve Water

PipeDiver Concrete Detection cap

- For PCCP, PCP or BWP pipelines
- Excellent scanning reliability, proven principle
- Detection for up to a single broken wrap
- Pressurized or depressurized insertion and extraction of the tool
- Engineering report to determine failure point for each individual damaged pipe segment



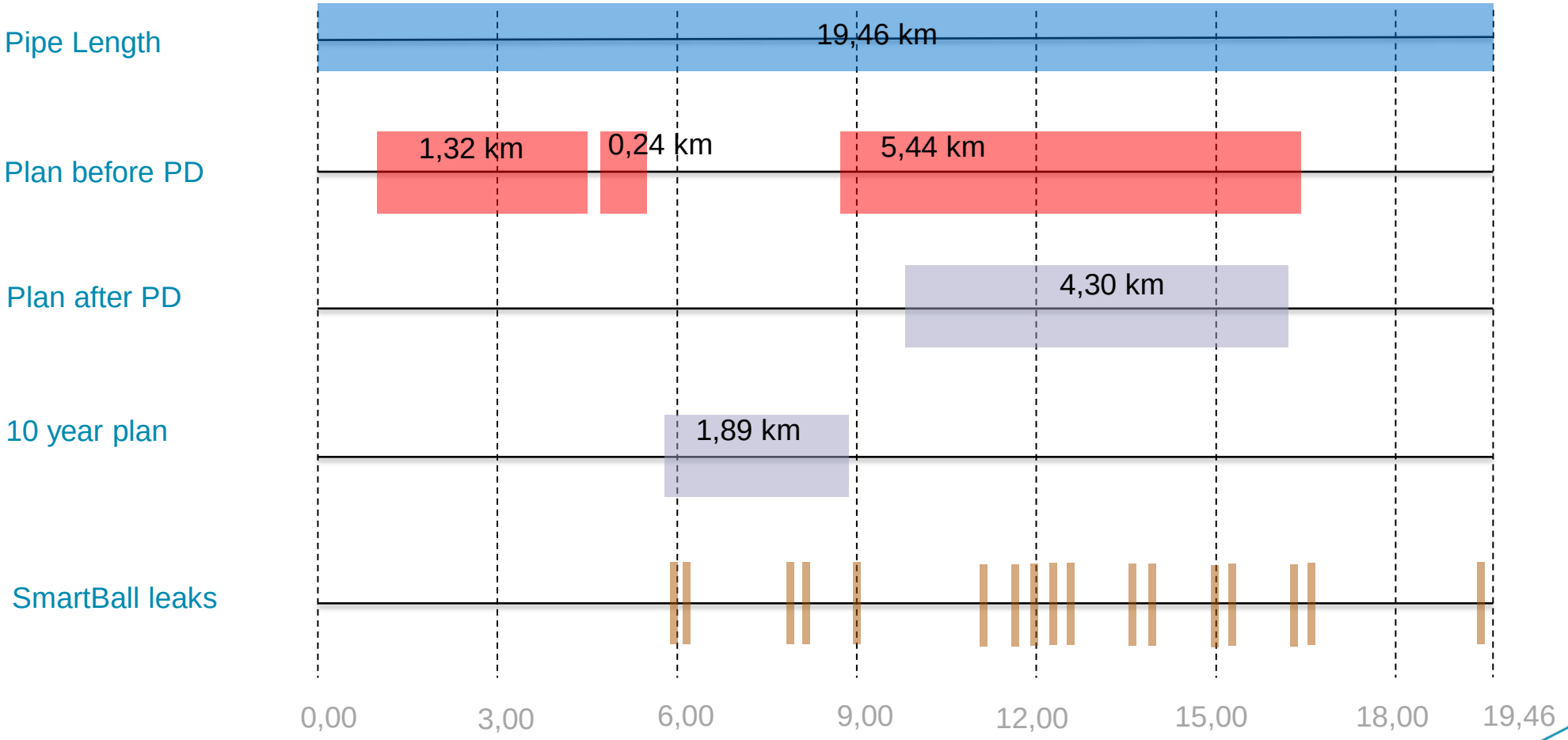
Number of Wire Breaks

PipeDiver – Case study

Decision-making Results with PD:

- Imidiate investments dropped by 38% - 2,49km
- 66% has remaining lifetime of 20+ years
- Dramatic changes to investments for next years

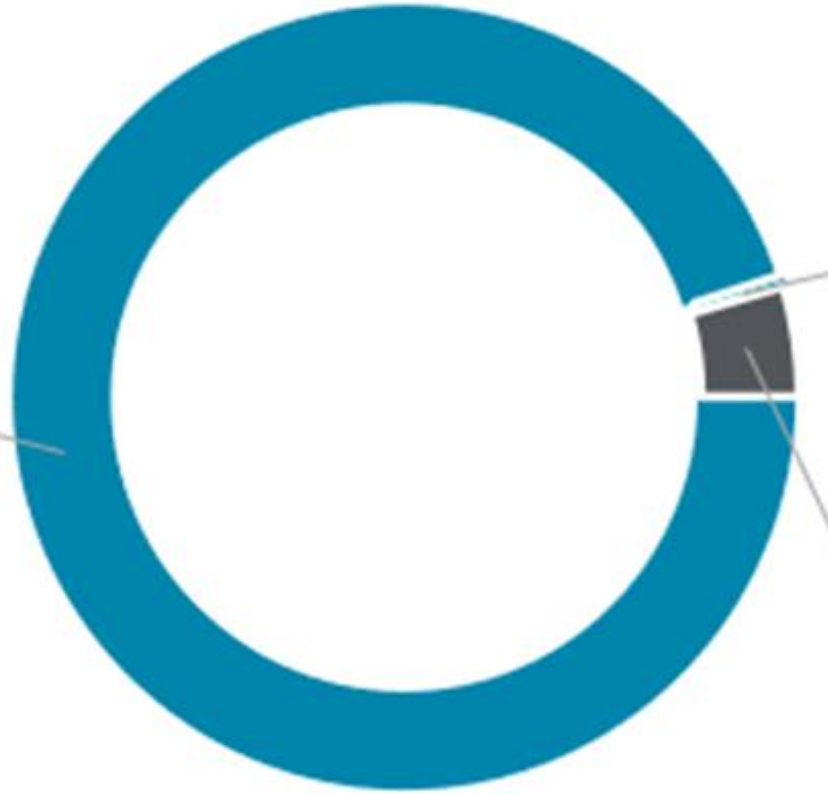
	Renewal	Renewal	Renewal	Total
	Now	**Within 10 years**	**Within 20 years**	--
Original investment plan	**6,99 km**	**12,47 km**	**--**	**19,46 km**
New investment plan	**4,3 km**	**1,89 km**	**13,27 km**	**19,46 km**



xylem
Let's Solve Water

PipeDiver - Results

2,728 Pipes with no defects
where 384 pipes have out-of-roundness >5 %
- and where the 17 leaks are located



14 Pipes with defects
where 2 pipes have maximum out-of-roundness >5 %

130 Pipes with unfavourable liner
where 6 pipes have out-of-roundness >5 %

PipeDiver – Results / Wall loss

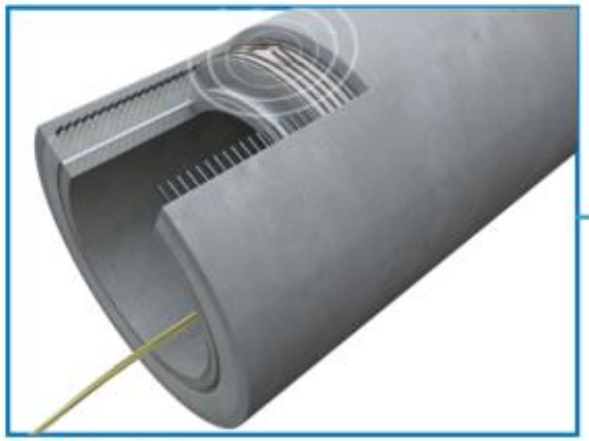
PipeDiver Wall loss finds					
Section	**Pipe Segment**	**Number of Defects**	**Dimensions (cm x cm)**	**Biggest wall loss**	**Defect type**
1	10052	7	36x114 (largest)	45% to 60%	External
1	10158	5	5x117	46% to 69%	External
1	10162	2	5x33	55% to 60%	External
1	10201	3	5x18	57% to 68%	External
1	10238	2	3x25	48% to 56%	External
1	10411	3	8x23	50% to 60%	External
1	10466	1	8x33	50%	External
1	10525	1	30x97	20%	External
1	10555	1	10x61	50%	External
1	10618	2	10x8	15% to 25%	External
1	10644	2	10x10	25% to 30%	External
2	20246	1	25x13	50%	External
3	30556	1	68x21	15%	External
3	30694	1	6x11	50%	External

SoundPrint AFO – Acoustic Monitoring of PCP and PCCP pipelines

1300KM of Pipeline Currently Being Monitored Across the Globe.

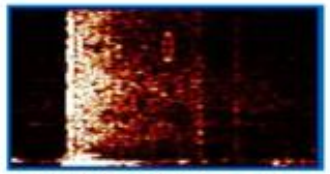
xylem
Let's Solve Water

How SoundPrint AFO Works: When Wires Fail



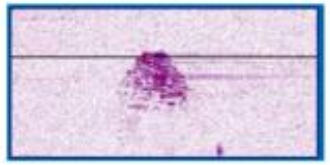
1. Wire fails

2. DAQ captures event



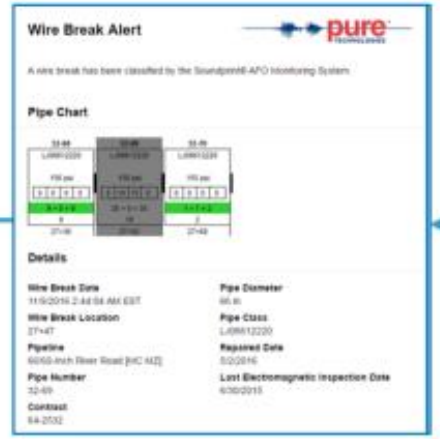
2.1 Acoustic data

2.2 Location data



3. Data analyzed

4. Reviewed & location mapped to pipe

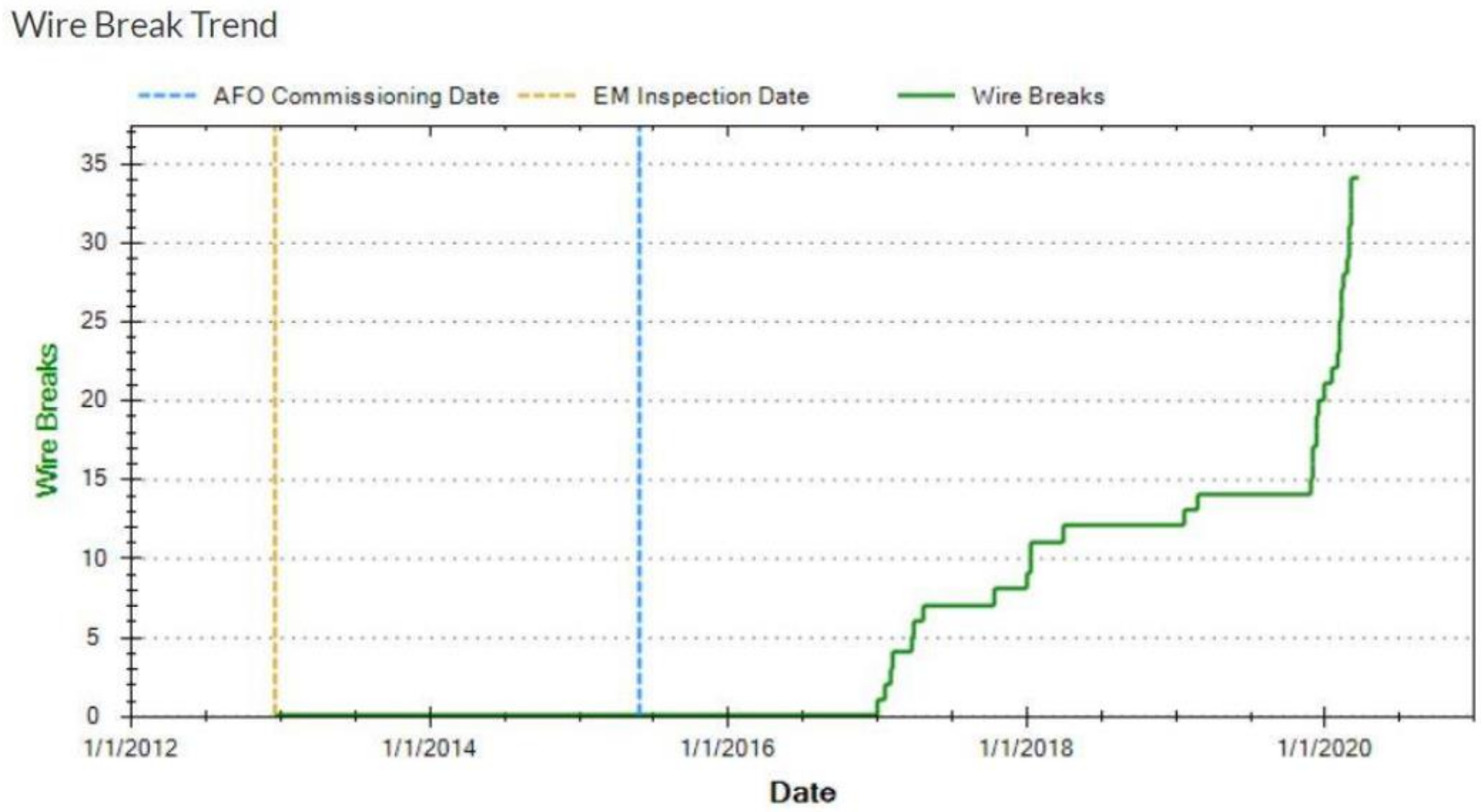


4.1 Email alert

4.2 Data available on GIS website

xylem
Let's Solve Water

AFO Case Study – Long Term Monitoring Prevents Failure

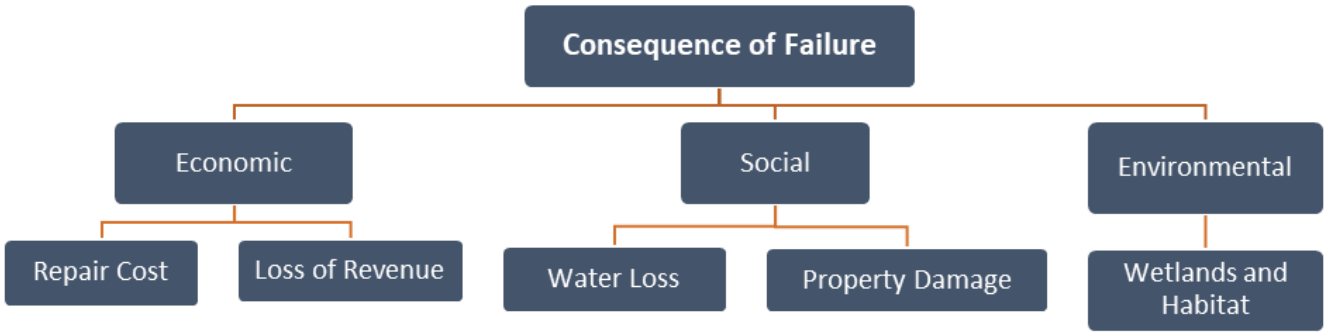


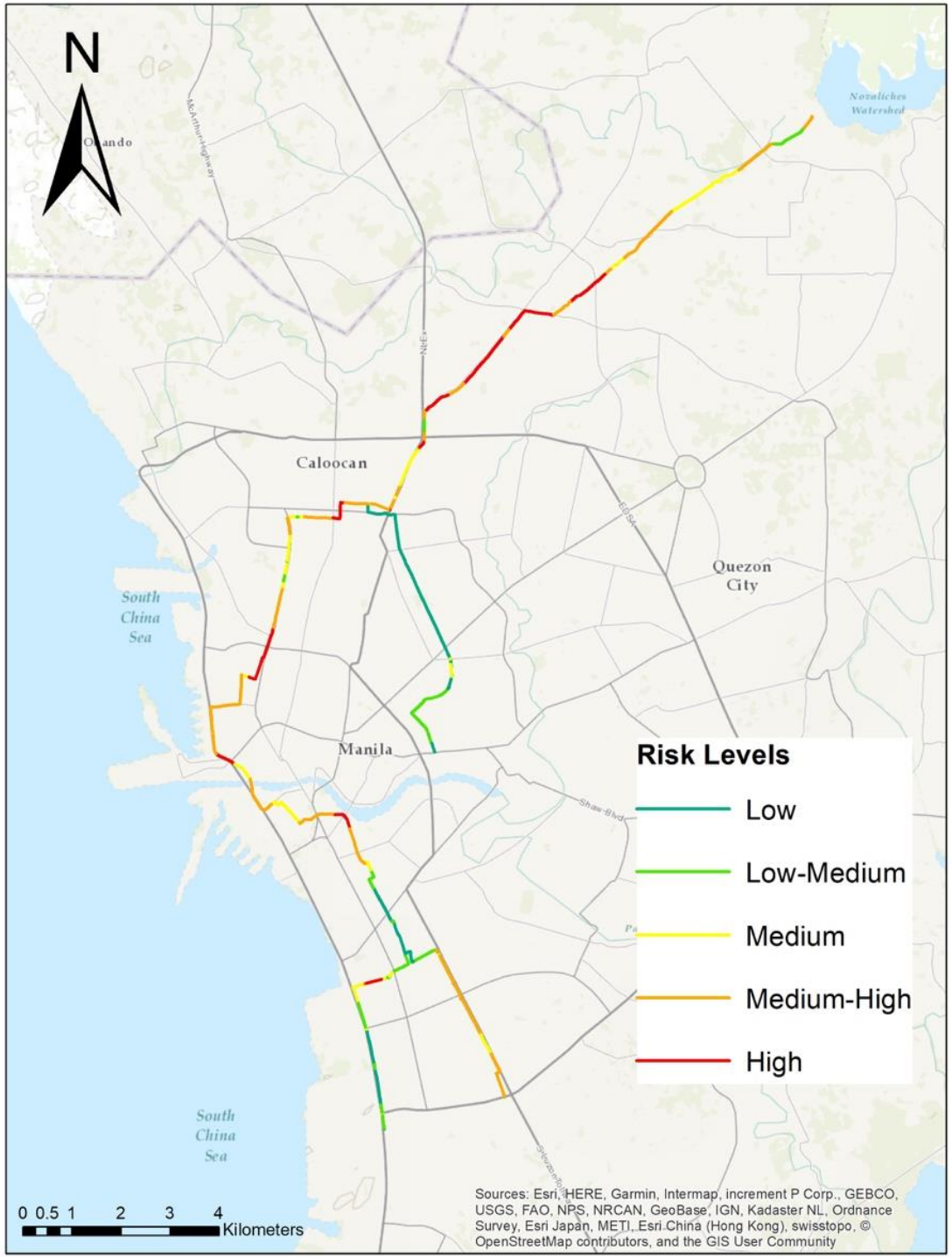
xylem
Let's Solve Water

Where to Start?

Pipeline Risk Prioritization

- **Consequence of Failure** key to risk for transmission pipelines





Our Pipeline Management Approach

PROACTIVE MANAGEMENT
Protect pipeline forever

PREDICTIVE ANALYTICS
Forecast future condition

ASSESSMENT PLAN
Prioritize pipelines for assessment

PRECISE ASSESSMENT
Understand current condition

xylem
Let's Solve Water

Xylem believes Large Diameter Pipes are “Forever Assets”

Large pressurized pipelines have an indefinite and extremely long service life, if maintained.

We can say this with confidence thanks to our data!

xylem
Let's Solve Water

xylem
Let's Solve Water

Thank you

Visit us at our booth to find out more !

//QR code for contact details