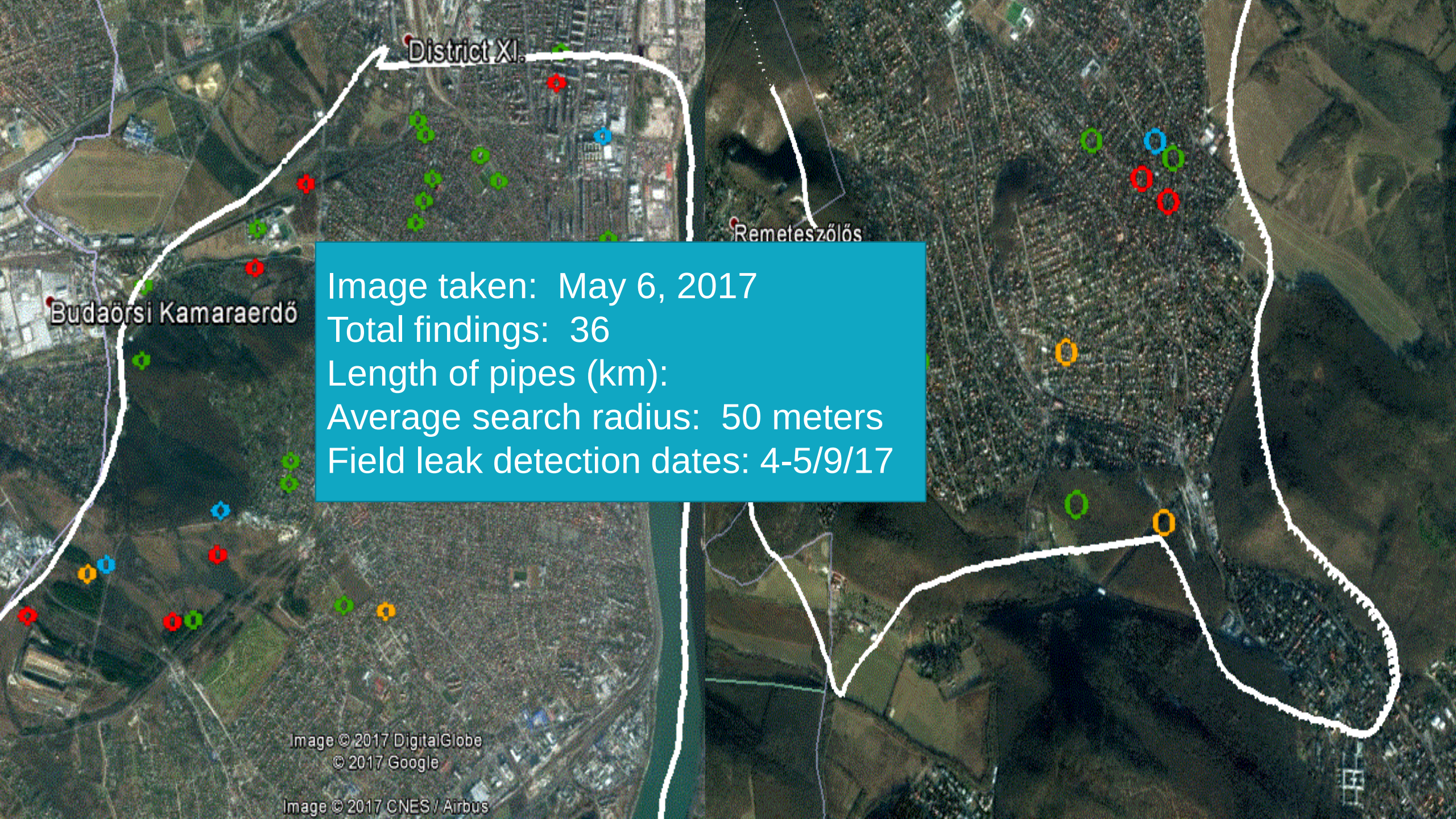
UTILIS

Leaks can be detected from space

Summary of Pilot project

BUDAPEST WATERWORKS

AQUACUST Vízveszteség-elemző Kft.


District XI.
Remeteszőlős
Budaörsi Kamaraerdő
Image taken: May 6, 2017
Total findings: 36
Length of pipes (km):
Average search radius: 50 meters
Field leak detection dates: 4-5/9/17
Image © 2017 DigitalGlobe
© 2017 Google
Image © 2017 CNES / Airbus

Comparing Utilis date with leak history

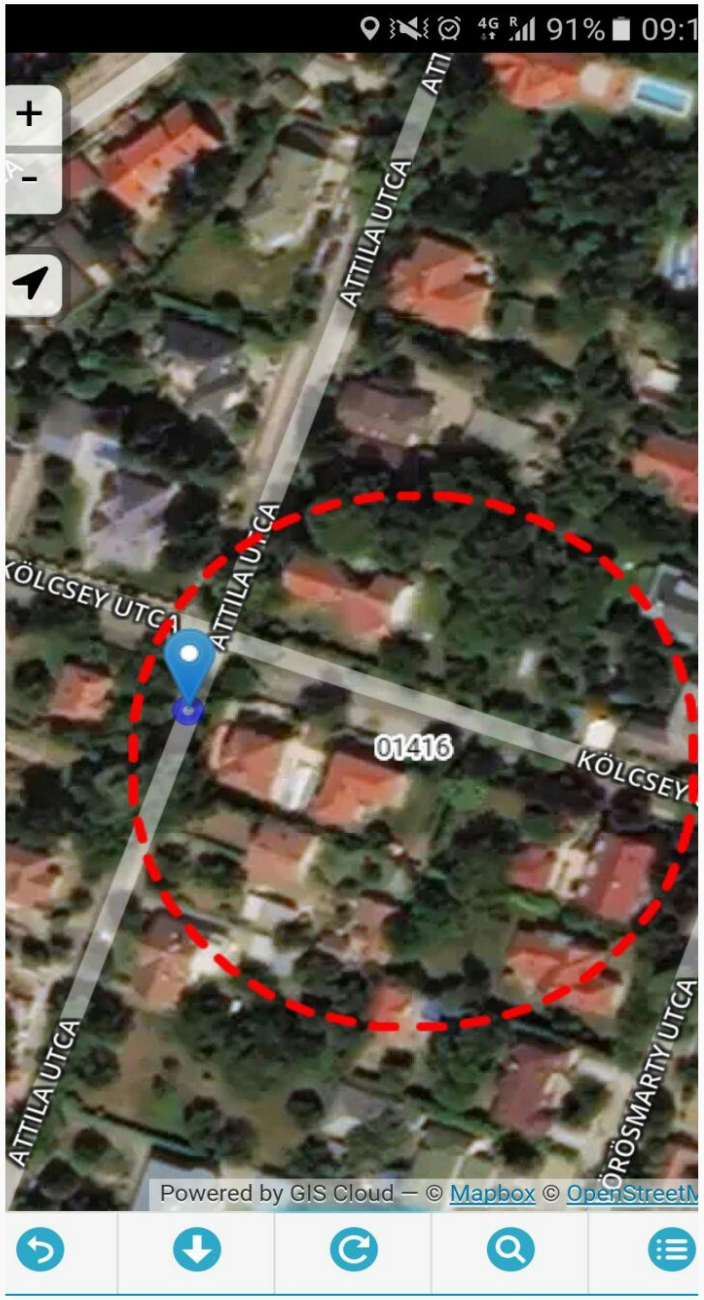
Utilis ID	Street	Number	Code	City
01414	Noémi utca	15	1028	Budapest
01420	Dózsa György útca	105	1224	Budapest
01450	Kártya utca	2	1221	Budapest

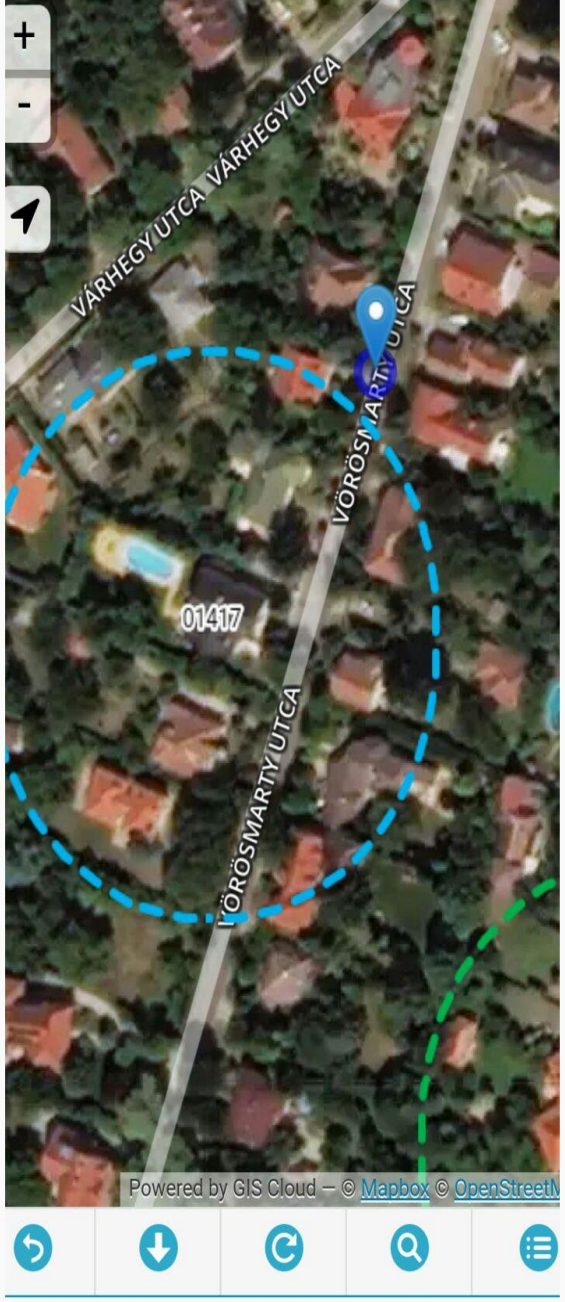
3/36

Field Verification Summary Report

Finding Type	Total
Leak	10
Unverified	2
Quiet	4

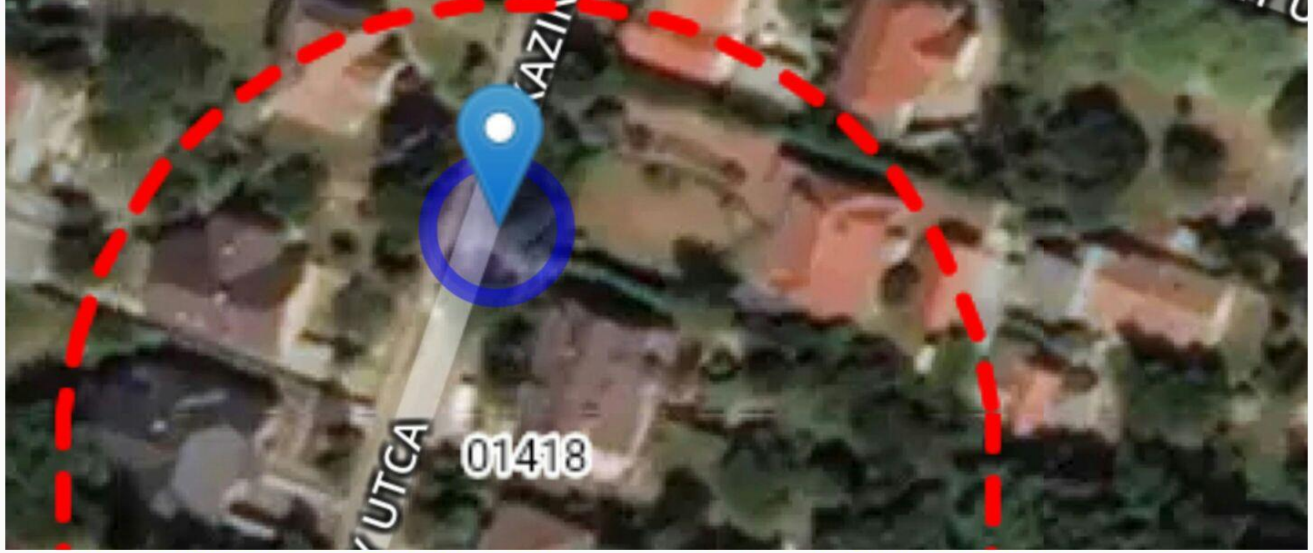
Leaks per day: 5

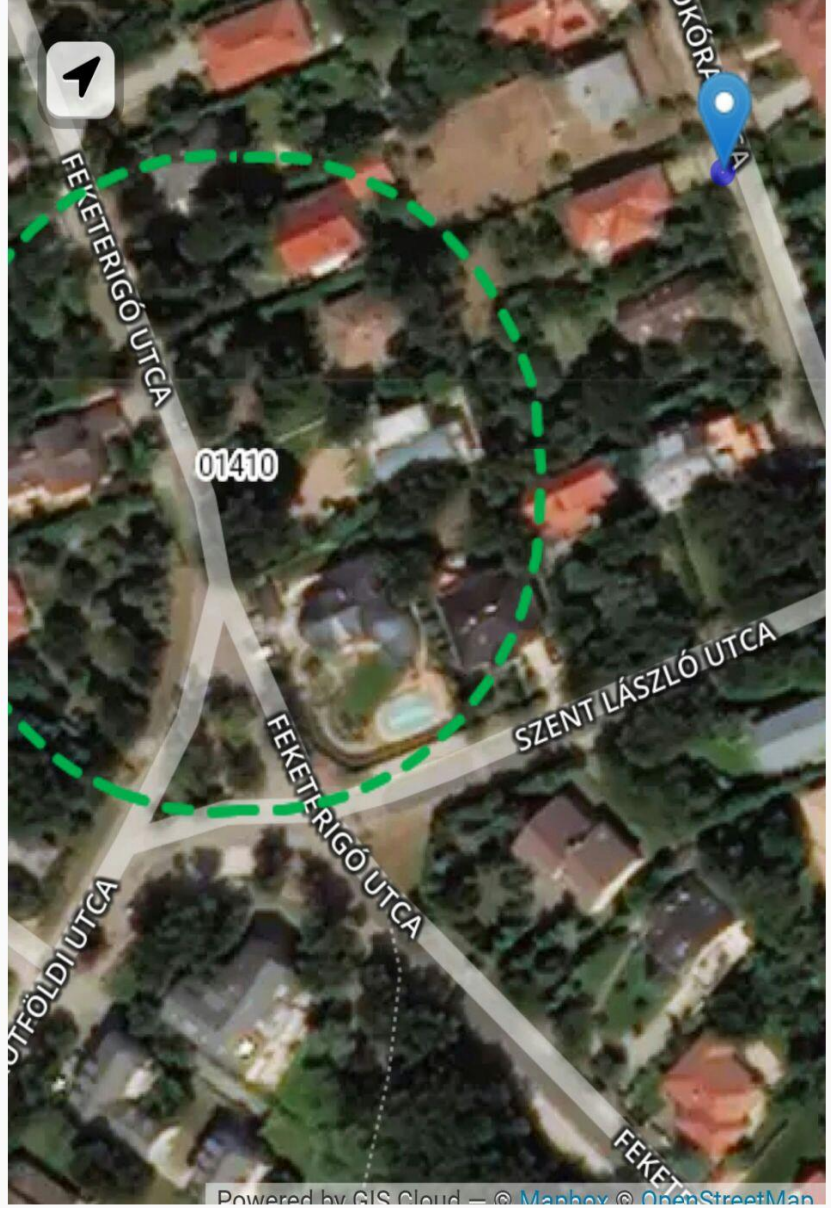


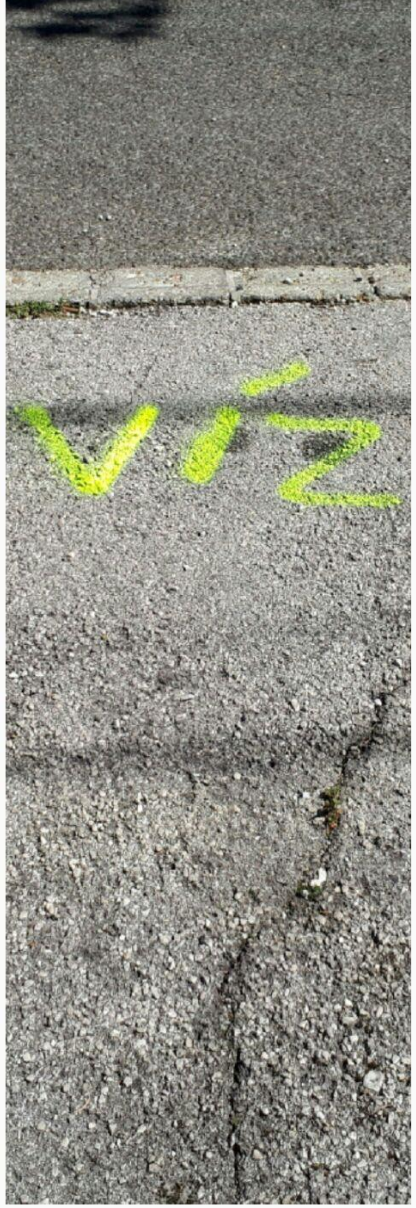


01416 – leaking hydrant

01417– leaking hydrant

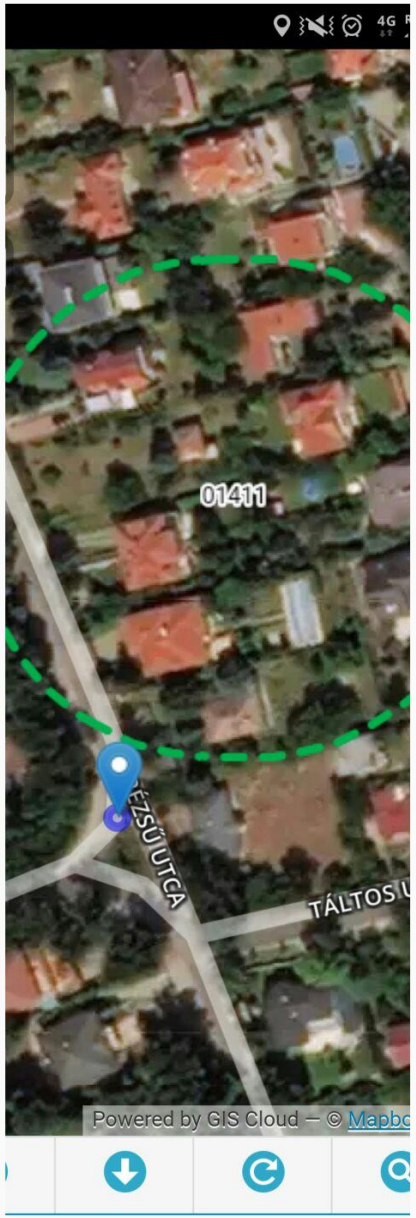




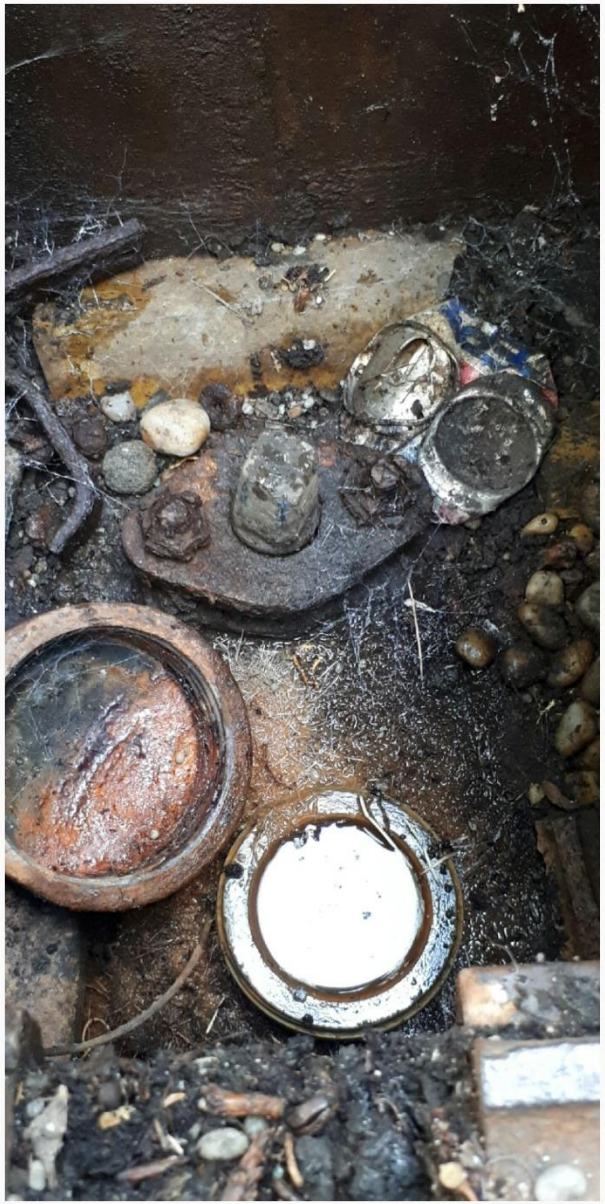


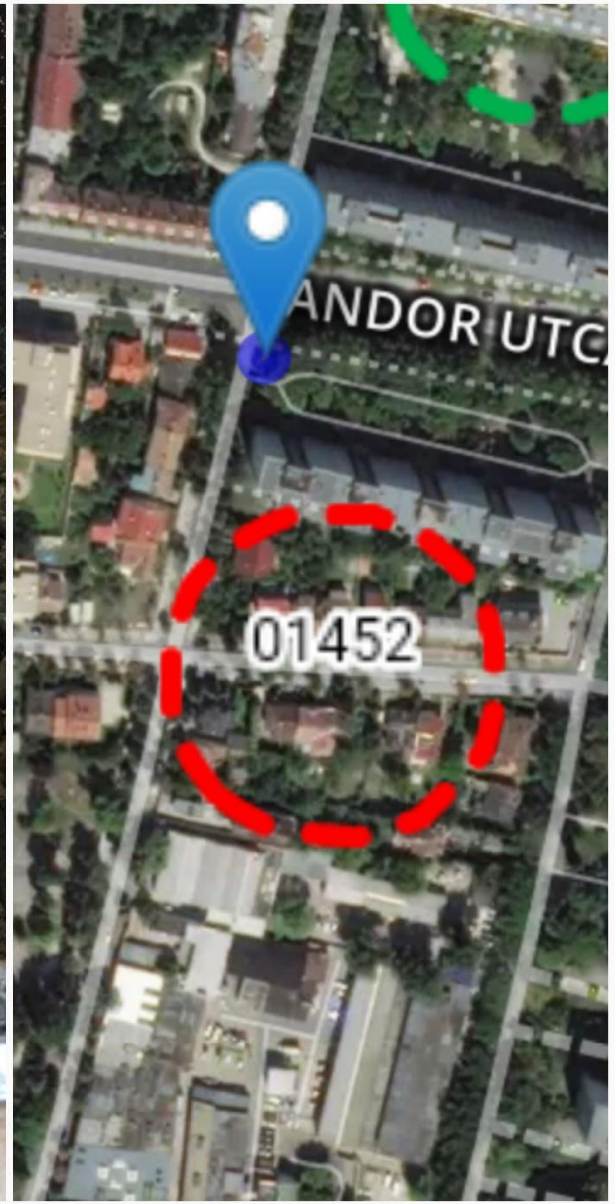
01418 – leak on service
Estimated 8 l/m

01410 – leak on main



01411 – leaking hydrant valve
Estimated 30 l/m





01452 – leaking hydrant valve
Estimated 0.1 l/m

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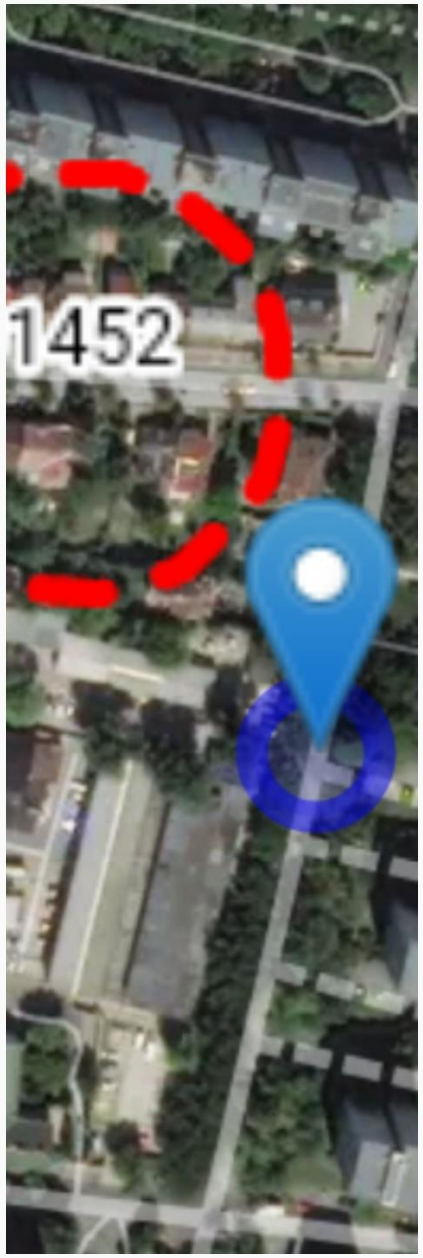
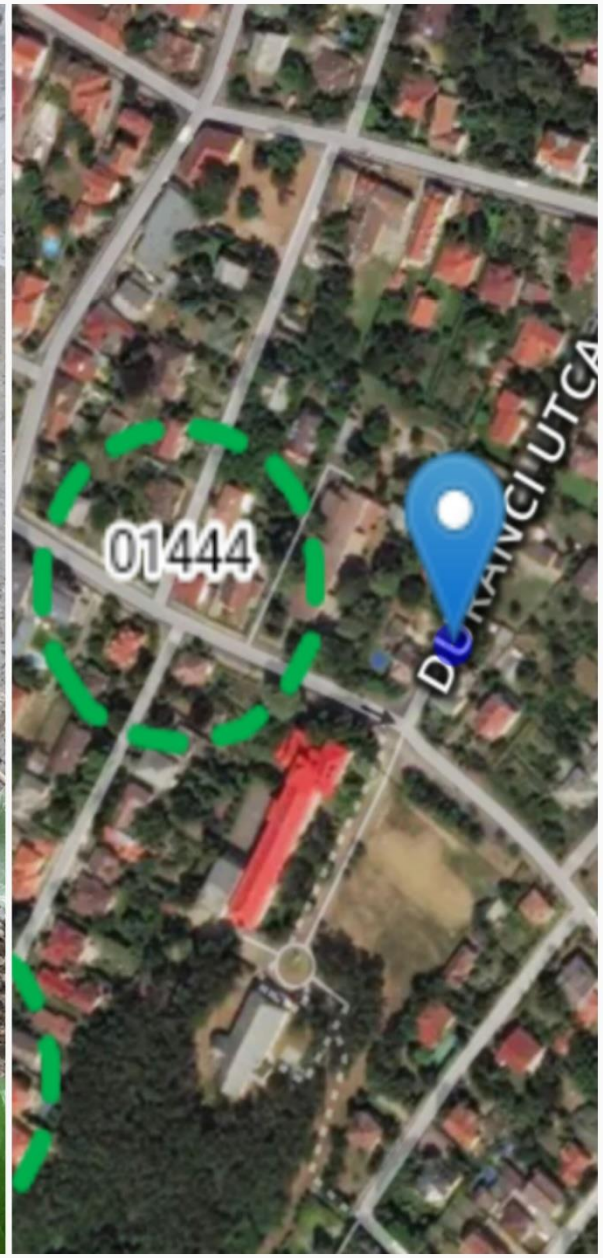
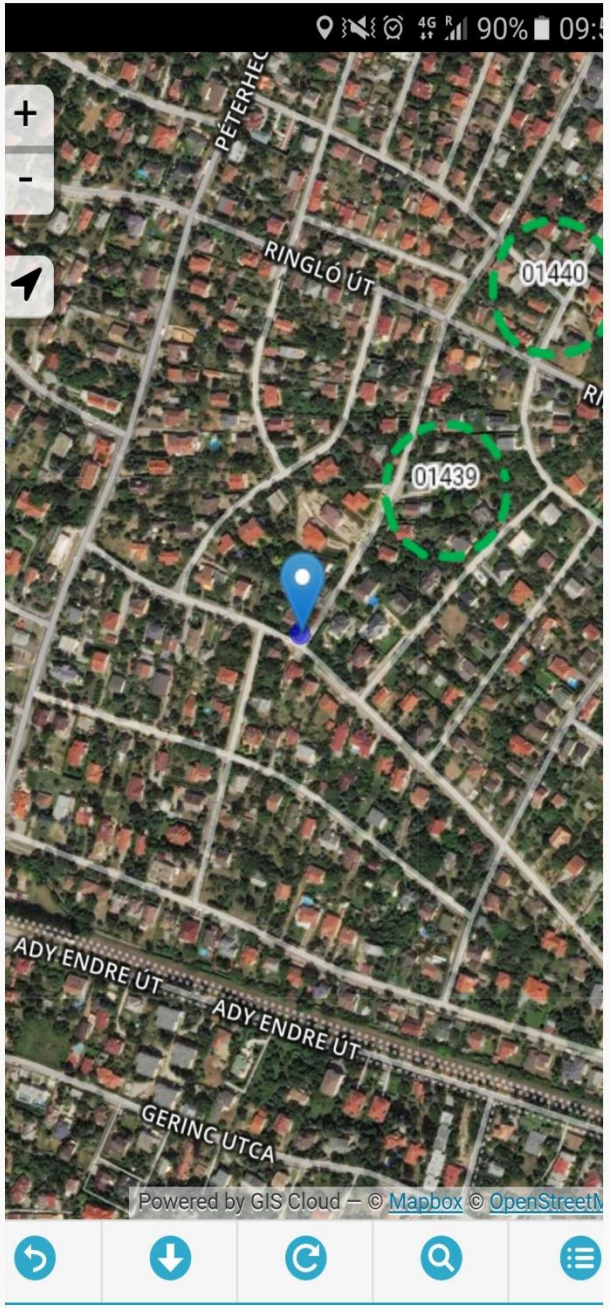


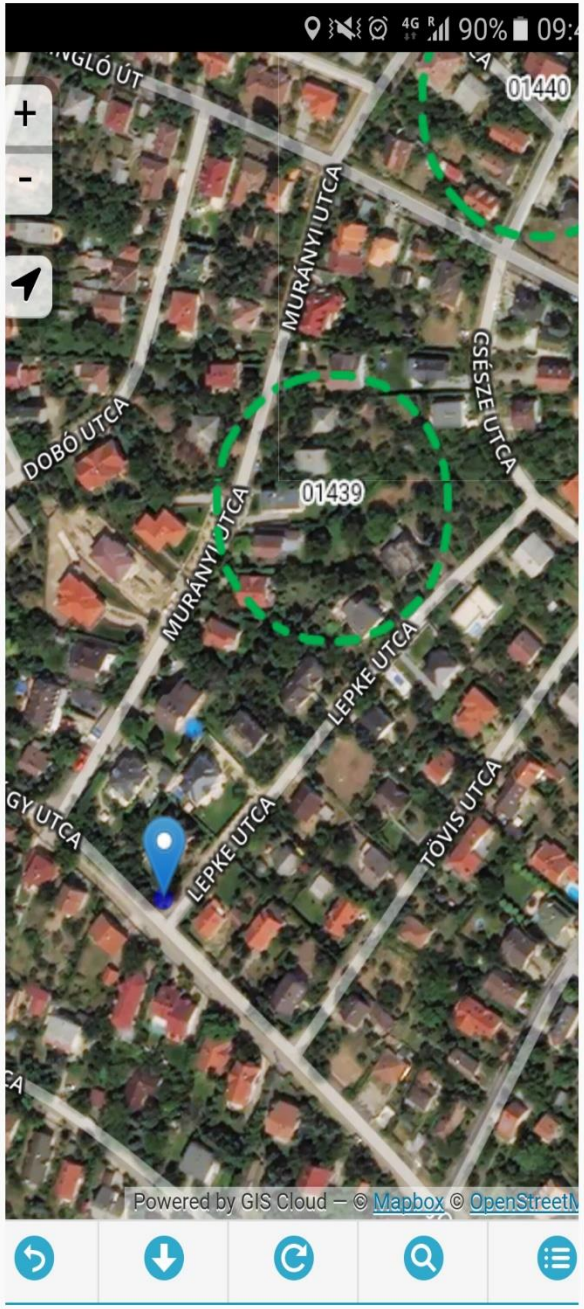
01452 – leaking hydrant valve



01444 – leak on service fixed 2 weeks ago



01439 – leaking hydrant



01439 – leaking drinking fountain

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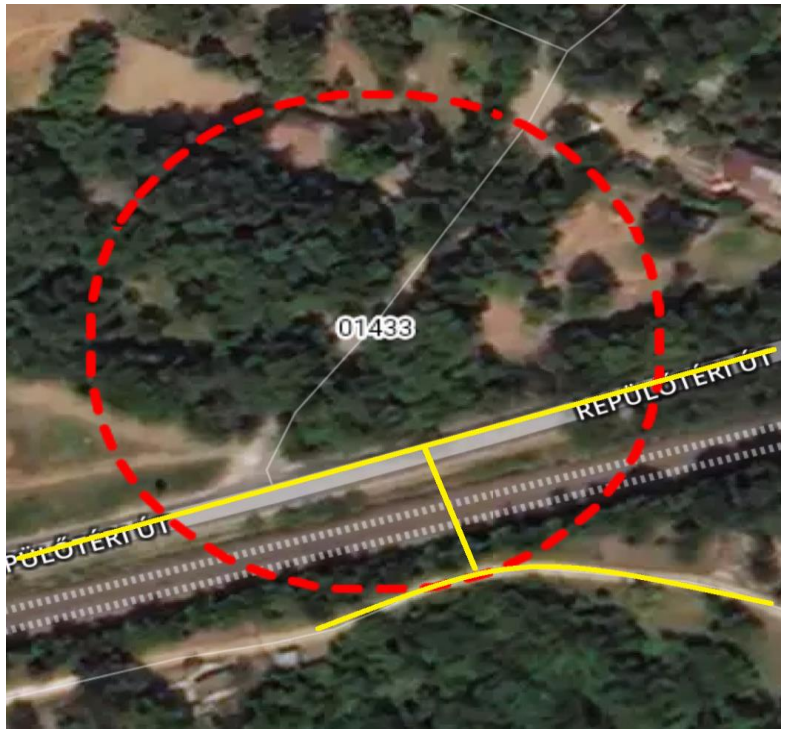
Unverified – there is still a chance for a leak

01413 – no access to 500mm pipe



01433 – no access to 200mm pipe, runs under train – recommend further investigation

GPR

Pressure test/helium test

Create additional access points

Transmission mains – Big diameter

- Limited access points
- Big diameter – not good acoustics
- No one will complain

Utilis can act as a guide to begin and learn this field and try to prepare analysis and assessment plans for these pipes

Kansas City, USA March 2017

Australia November 2016

Lets do some math…

Facts:

Volume of water: 162,802,000m^3

Volume of revenue water: 137,189,000m^3

NRW: 25,613,000m^3

*annual report 2015

Physical loss (50% of NRW) = **12,000,000m^3** (estimated 8%)

Utilis : zero means zero

Unavoidable background leakage rates

Infrastructure Component	Background Leakage at ICF=1.0	Units
Mains	9.6	liter per kilometer of mains per day per meter of pressure
Service Connection – main to curb-stop	0.6	liter per service connection per day per meter of pressure
Service Connection – curb-stop to customer meter	16	liter per kilometer of service connection per day per meter of pressure

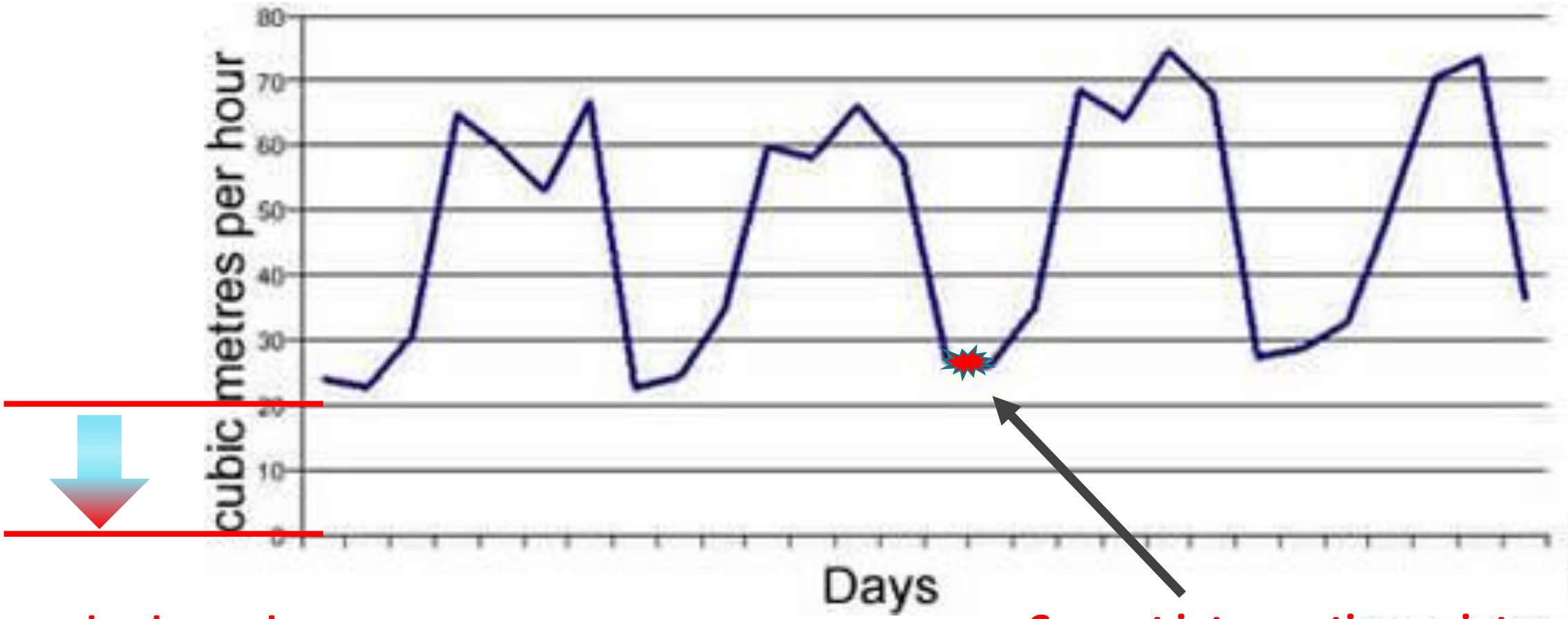
Source: Lambert et al. 1999

UBL in Budapest = 4,040,579 m^3 p.a.

Today this number = 0 (base line)
Utilis is looking to lower the UBL

Mains length	5,700
Pressure	49
Service connections	240,000
Length of Service connections	1,700

Mínimum Night Flow – Bring it down to Zero



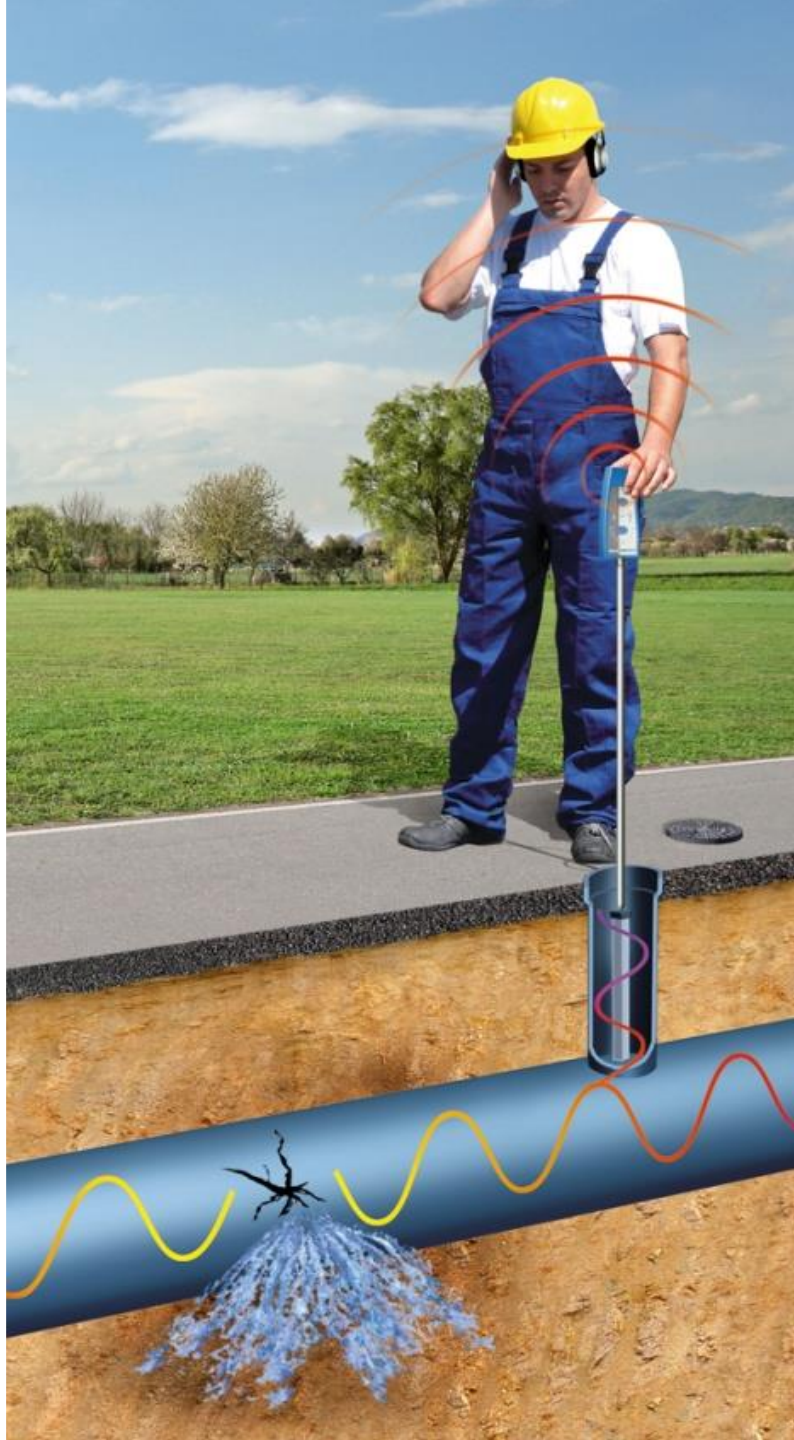
Utilis approach = lower base line of MNF

Current intervention point

Current leak detection 250 leaks in 800 KM per year based on UBL and MNF

*Aquacust example

Satellite guided leak detection based on WATER LOSS
finds more leaks per day
cover more KM per year



Utilis:

"finding and fixing leaks faster than they reappear is a key for water loss reduction"

Our offer – test Utilis over 1 year (extended pilot)

Step by step:

1. Choose several DMAs (about 2000KMs)
2. Create together a platform for safe data management of this project
3. Schedule to scan these DMAs 3 times per year
4. Before each scan check MNF or water balance over past month
5. Dedicate and certify an acoustic team for Utilis work
6. Fix all leaks found by acoustic team/estimate annual size
7. After every scan measure MNF or water balance over next month to compare with previous measurements
8. Summarize and make calculations for multi annual engagement in Budapest as well as 3rd party projects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Thank You!