2026 VERSION

STARmass™
Environment Technologies Corporation - Canada

# PIPE MAPPING & LEAK DETECTION CAPABILITY

**Smart** Detection | **Zero** Disruption | **24/7** Integrity

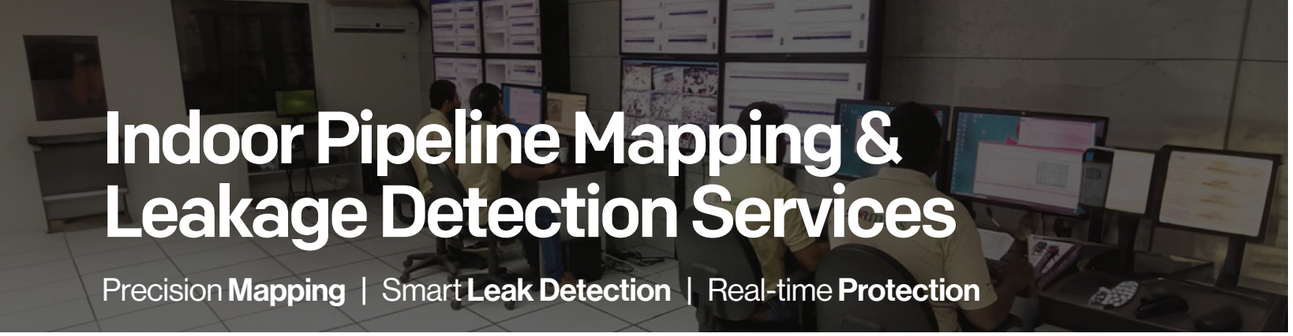
- **Pipeline Mapping & Route Identification**
- **Leakage Detection & Condition Assessment**
- **Smart Sensors & Scanning Systems**
- **Digital Asset Integration & Analytics**
- **Rapid Response & Isolation Readiness**

*From Source to System - **Complete Fluid Integrity Audits***


Starmass Leakage Audit on a Refinery Potable water lake - 2017

**Domestic | Industrial | Oil & Gas | District Cooling | Water**

**Comprehensive solutions for Liquid, Gas, and Thermal Networks** — ensuring that every flow path remains visible, safe, and efficient.



# Indoor Pipeline Mapping & Leakage Detection Services

Precision **Mapping** | Smart **Leak Detection** | Real-time **Protection**

**InfraHealth** delivers advanced pipeline and utility **mapping services** for above-ground, underground, and indoor networks. Our mapping solutions create a **digital twin** of your **entire pipeline system**, improving accuracy, safety, and lifecycle management for diverse fluids — water, oil, gas, chilled water, and sewage.

## PIPELINE MAPPING SERVICES

- **Route Identification & Depth Profiling** – Locating metallic and non-metallic pipelines, ducts, and conduits.
- **3D Subsurface Mapping** – Integrating GPR, electromagnetic, and LiDAR data for underground visualization.
- **As-Built Verification & Digital Documentation** – Capturing real route alignment, depth, and geometry for record drawings.
- **Utility Conflict & Cross-Service Assessment** – Identifying interference between parallel or intersecting utilities.
- **Digital Twin & GIS Integration** – Linking spatial data with design, maintenance, and SCADA systems.
- **Pipeline Material Classification** – Differentiating between metallic, composite, and thermoplastic materials.

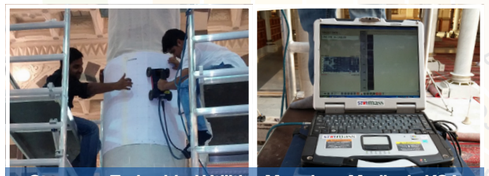
## LEAKAGE DETECTION & CONDITION ASSESSMENT

- **Pressurized Water & Chilled Water Pipelines** – Correlation, hydrophone, and fiber-optic DTS for leak localization.
- **Oil & Gas Transmission Lines** – Smart pigging, pressure transient analysis, and acoustic monitoring.
- **Wastewater & Sewage Systems** – CCTV, smoke/dye testing, and flow balance analysis for infiltration/exfiltration.
- **District Cooling & Energy Networks** – Thermal imaging, DTS sensors, and pressure monitoring
- **Chemical & Industrial Pipelines** – Vibration-based leak detection and ATEX-rated monitoring systems
- **Cross-Network Leak Correlation** – Multi-sensor analysis combining acoustic and hydraulic data.

*Transforming field intelligence into actionable digital insights.*

## DIGITAL INTEGRATION & ANALYTICS

- **Centralized GIS Dashboard** – Integrates mapping, leak, and condition data.
- **BMS / SCADA Connectivity** – Real-time alarms and system visibility for operations teams.
- **Cloud-based Data Fusion** – Aggregates acoustic, thermal, and hydraulic inputs into one interface.
- **AI-driven Condition Prediction** – Identifies patterns in leak recurrence and pressure variations.
- **Lifecycle Risk Reporting** – Generates compliance-ready reports with visual maps and performance



Starmass Embedded Utilities Mapping - Madinah, KSA

Starmass Leak Detection System Design - Makkah, KSA

*All project images shown are from verified Starmass installations, investigations & audits.

# Outdoor Leak Detection & Pipeline Mapping Services

**Advanced Outdoor, Subsurface & Pipeline Integrity Monitoring**

**InfraHealth** delivers end-to-end **mapping and leakage detection** for buried utilities and pipeline corridors — integrating **acoustic, geophysical, and digital mapping technologies** to provide complete visibility, accuracy, and control across water, chilled water, and wastewater networks.

## PIPELINE LEAK DETECTION

- Acoustic correlation & ground microphones
- Smart pigging and hydrophone sensors
- Pressure transient analysis
- Fiber-optic Distributed Acoustic Sensing (DAS)
- Thermal imaging via UAV or fixed mast
- Tracer gas (helium/hydrogen) pinpoint testing

## PIPELINE MAPPING & ROUTE IDENTIFICATION

- **Ground Penetrating Radar (GPR)** – Non-destructive mapping of buried utilities and voids.
- **Electromagnetic (EM) Pipe Tracing** – Identifies metallic and non-metallic pipelines with high positional accuracy.
- **GPS / GIS Survey Integration** – Correlates mapping data into digital twins and asset registers.
- **Depth & Alignment Profiling** – Captures topography, bends, and as-built deviations.
- **Defect Correlation Layering** – Links mapping data with leak, corrosion, or insulation defect locations.
- **3D Subsurface Visualization** – Overlay of mapped utilities and detected anomalies in InfraHealth dashboards

*Mapping and leakage analytics form the foundation of our "Digital Integrity Audit" — linking every buried asset to its precise geospatial footprint.*

Starmass 200 cm Underground Pipe Mapping - Jeddah

## DISTRICT & NETWORK MONITORING

- Real-time flow/pressure telemetry nodes
- Smart valve districting & isolation control
- Cloud-based hydraulic balance analytics
- GIS-integrated leak & flow mapping dashboard

## UNDERGROUND / UTILITY CORRIDOR SCANNING

- Multi-technology GPR and EM detection
- Infrared thermography for buried leaks
- DTS/DAS fiber-optic trench monitoring
- Tracer gas (helium/hydrogen) pinpoint testing

Starmass Industrial Audits

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# Technologies

## Indoor Technologies

- **IoT Leak Cables & Spot Sensors** – *Continuous fbor or tray monitoring for mechanical rooms, basements, and risers.*
- **Clamp-on Ultrasonic Flowmeters** – *Detects abnormal fbw or imbalance in HVAC or chilled-water loops.*
- **Acoustic Correlators & Listening Devices** – *Pinpoints pressurized line leaks in risers and utility rooms.*
- **Infrared / Thermal Imaging** – *Identifies temperature anomalies on ceilings or mechanical piping.*
- **CCTV / Endoscopic Inspection** – *Internal visual check for cracks, joints, or infltration/exfltration.*
- **Dye / UV Tracing** – *Simple confrmation of leak paths in plumbing and chilled-water systems.*
- **Fiber-optic DTS** – *Temperature monitoring of buried chilled-water lines or tunnels.*

## Outdoor Technologies

- **Acoustic Correlation & Hydrophones** – *Detects and locates leaks on buried pressurized pipelines.*
- **Pressure Transient Analysis (PTA)** – *Identifes bursts or surges in long-distance mains.*
- **Fiber-optic DAS / DTS** – *Monitors vibration, stress, and temperature in buried corridors.*
- **Ground Penetrating Radar (GPR)** – *Maps buried pipes and detects voids or wet zones.*
- **Electromagnetic / RF Pipe Locators** – *Traces metallic and non-metallic pipelines accurately.*
- **Thermal / UAV Infrared Imaging** – *Detects hot or chilled-water leaks across surface networks.*
- **Tracer Gas ($H_2$/He)** – *Pinpoints leaks in non-metallic or low-pressure systems.*
- **Smart Pigging / ILI** – *Internal wall-thickness and defect mapping for large mains.*
- **GPS / GIS Mapping Integration** – *Digital twin of pipelines with overlay of defect and route data.*

***InfraHealth's audit model integrates scanning, data analytics, and root-cause mapping — ensuring total asset visibility from surface to subsurface.***

## END-TO-END SERVICE WORKFLOW


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*A **Starmass Group Company** – Specialists in Infrastructure Lifecycle Integrity*

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For more info, visit **www.starmass.ca**