XPLORA®

Objective and Rapid Subsurface Analysis Through Artificial Intelligence

Xplora Srl
HQ: Piazza Castello 26, 20121 Milano (MI)
HQ: Via Marco Biagi 24, 43123 Parma (PR)
VAT: IT13071940962 | C. Soc. IV € 129.370,50

Contacts:
eric@xploragroup.ai
W: xploragroup.ai
Phone: +39 347 34 96 020

2017
R&D Started

2023
Xplora was founded

PARMA (IT)
HQ

TEAM
+20 PPL

+85
ACTIVE CUSTOMERS

>80K
ANALYZED HECTARES

XPLORA® Units

Xplora applications are categorized into three Business Units:

01

CIVIL & INFRASTRUCTURES

The Civil unit of XPLORA, utilizing advanced technologies originally developed for the defense sector, offers reliable and cutting-edge solutions tailored for EPC firms, multiutility companies, and the energy sector.

02

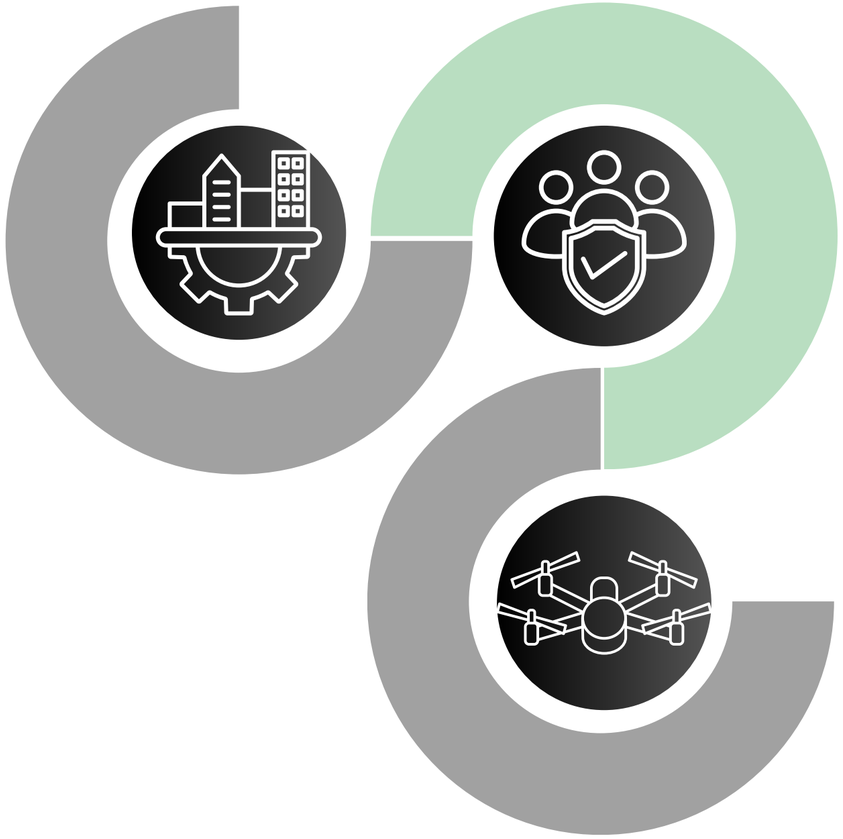
DEFENCE

The Defense Unit at XPLORA offers innovative situational awareness tools and threat detection systems.

03

INTEGRATED AERIAL SYSTEMS

This unit is dedicated to designing, engineering and assembling of drones equipped with sensors.



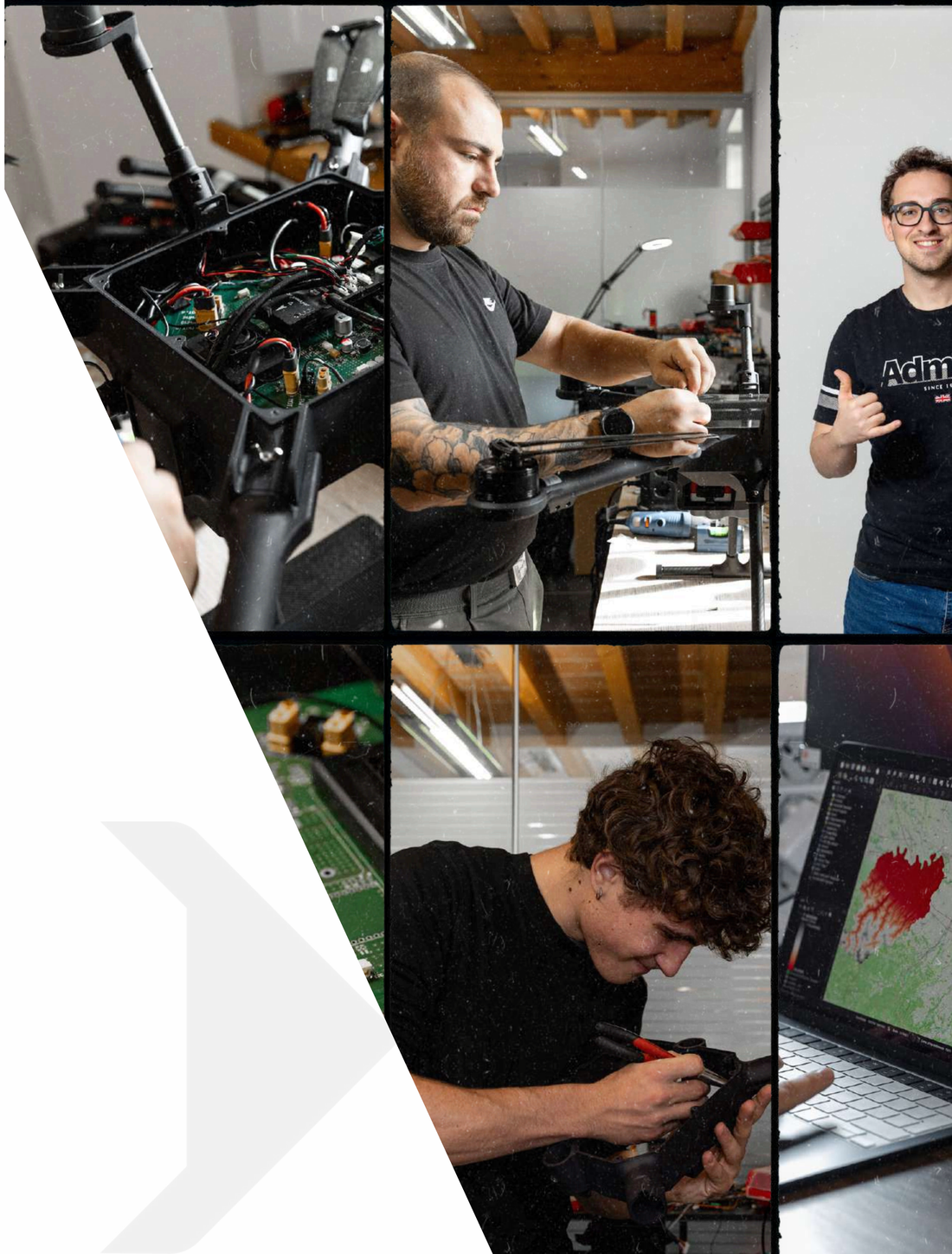
Human Behind Every Layer

AI-driven. Human-led.

At Xplora, we develop state-of-the-art AI and machine learning solutions — but our real strength lies in the people who design, operate and evolve them.

Our proprietary neural networks, advanced software systems and autonomous platforms are only possible thanks to a multidisciplinary team of engineers, geophysicists, developers, and operators who bring passion, accuracy, and field experience to every mission.

From the first feasibility study to the final 3D digital twin, we ensure human oversight, client collaboration and ethical deployment in every project.



DEEPGEO.AI®

Cutting-edge AI solutions for EPC and underground mapping

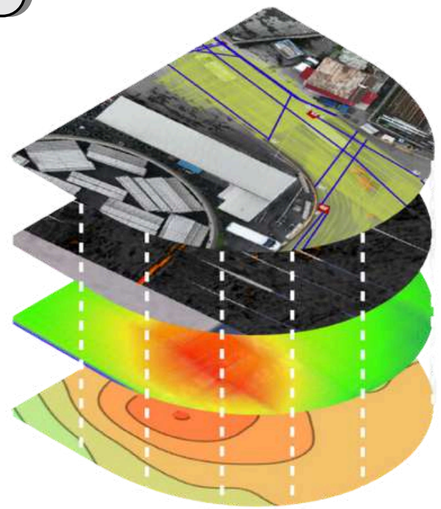
XPLORA® developed a groundbreaking **AI/ML-based solution** capable of performing a true "**CT SCAN**" of the subsurface.

PHOTOGRAMMETRY

RADAR GPR

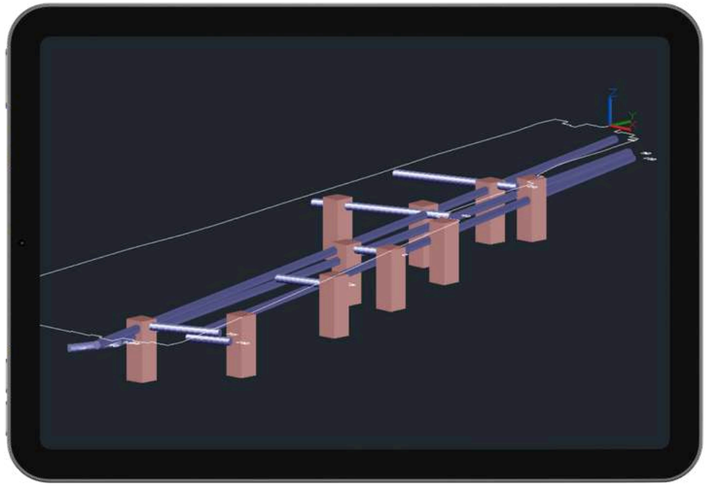
MAGNETOMETRY

ELECTROMAGNETOMETRY



AI

DEEPGEO.AI®



WATCH VIDEO

WHAT CAN WE DETECT & CLASSIFY

SUBSOIL INFRASTRUCTURES

SUBSERVICES GRIDS

UNEXPLODED ORDENANCE

ARCHEOLOGICAL FINDS

SUBSOIL STRATIGRAPHY

How we do it

We leverage top-tier commercial sensors — the true **value** lies in our **proprietary AI/ML software**

DEEPGEO.AI®

NON-INVASIVE METHODOLOGY

Performs subsurface analysis **without drilling** or excavation.

DATA OBJECTIVITY

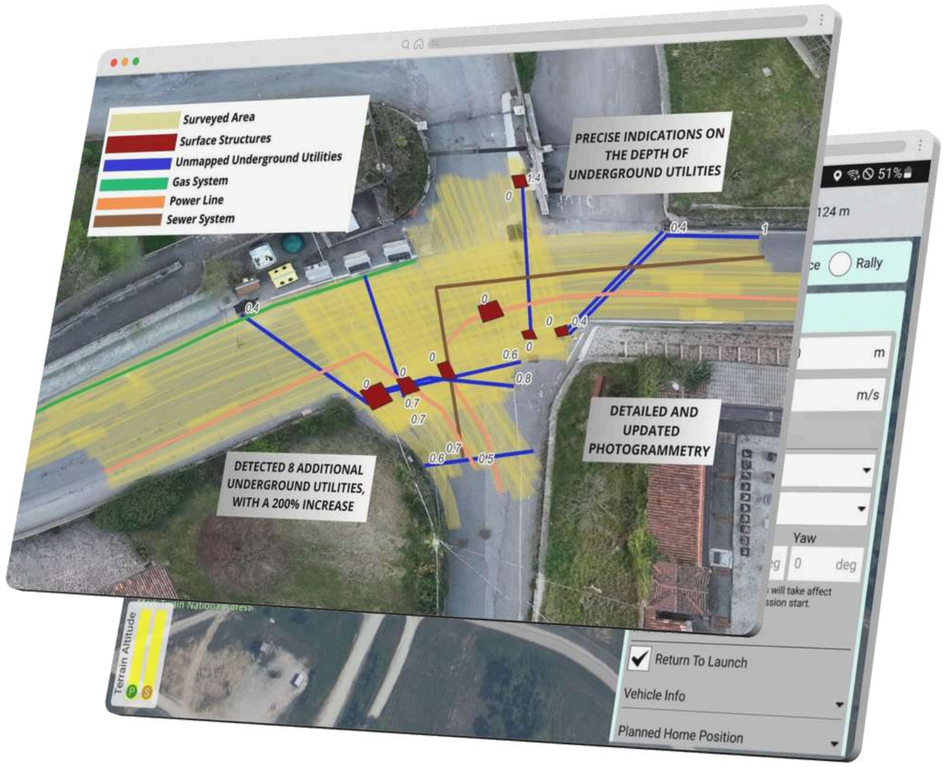
AI removes human interpretations, ensuring data that is consistently **precise** and **reliable**.

FAST TURNAROUND

Rapid data processing; results available within **hours** instead of weeks.

MINIMIZE FALSE POSITIVES

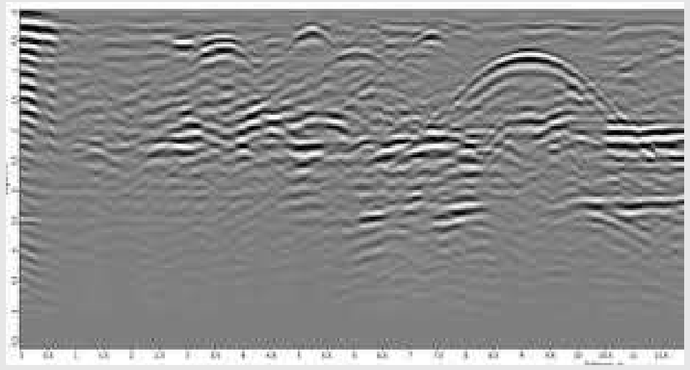
AI-driven fusion distinguishes threats, reducing **false positive**s in complex environments.



Methodologies

TRADITIONAL METHODOLOGY

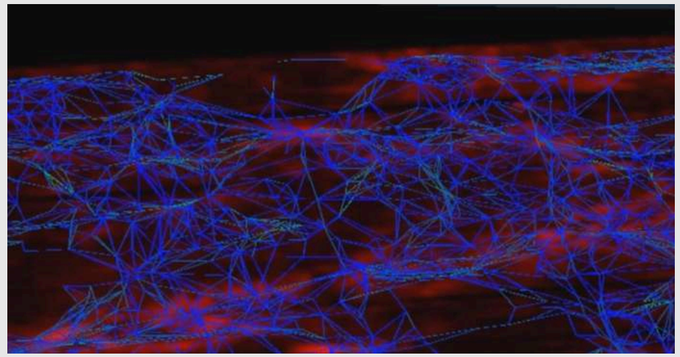
- Need for multiple instrumental field acquisitions → Long on-site occupation and high setup costs
- Manual interpretation of raw data → Risk of interpretation errors, reduced reliability of output, low detection rate of utilities, non-repeatable results
- Poor integration with GIS systems → Inaccurate geolocation of detected utilities



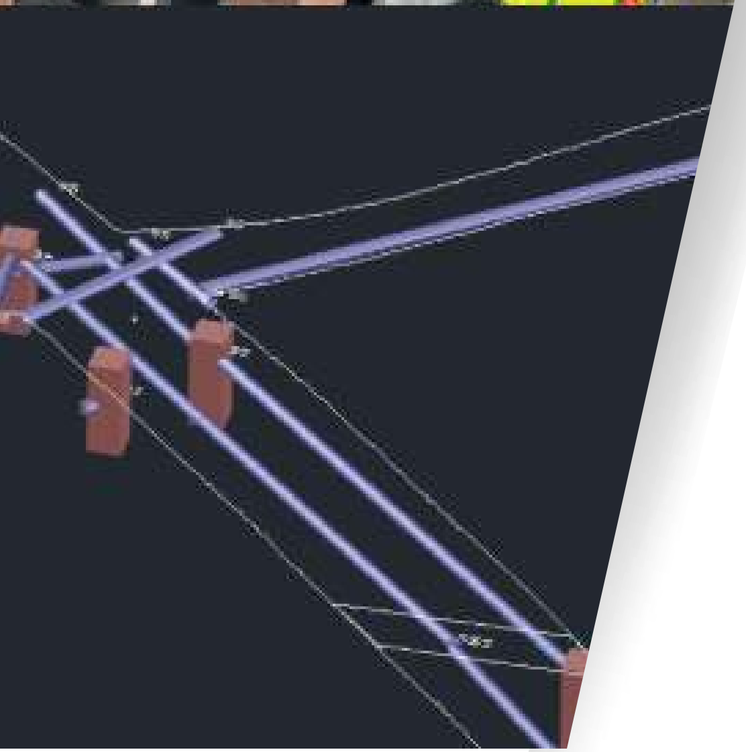
MANUAL PROFESSIONAL INTERPRETATION

DEEPGEO.AI® METHODOLOGY

- Single instrumental field acquisition required → **Short on-site occupation and low setup costs**
- Automated interpretation of raw data supported by Artificial Intelligence → **Accurate, reliable, and repeatable output with a very high detection rate of utilities**
- High integration with GIS systems → **Accurate geolocation of detected utilities**



NEURAL NETWORK AUTOMATIC DETECTION (NO INTERPRETATION AT ALL)



What can we detect

Through a multisensory approach utilizing both active sensors (electromagnetometers and GPR radar) and passive sensors (magnetometers), XPLORA can generate a comprehensive 3D CT scan of the subsurface, effectively identifying all structures present up to a depth of 12 meters. Specifically:

Mapping of subterranean utilities

- Standardized pipelines metallic and nonmetallic;
- Electrical conductors;
- Aqueducts;
- Sewage systems;
- Rare;
- Fiber optic cable assembly;

UXO Evaluation

- Artillery projectiles
- Aerial munitions
- Precision-guided munitions
- Ammunition
- Generic UXOs

Preventive Archaeology

- Archaeological remnants
- Intricate Frameworks

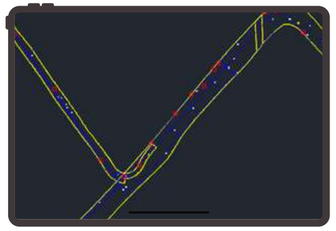
Environmental assessments

- Mapping of pollutant concentrations
- Cisterns and waste disposal sites

Geological Stratigraphy

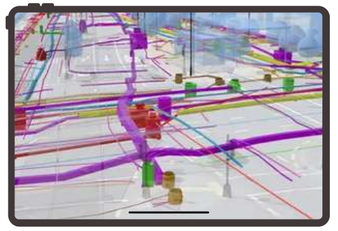
- Soil type mapping
- Cavity analysis

Final outcomes:



CAD 2D

GIS FILE



3D EXPORT

DEEPGEO.AI®

Performances

DeepGeo-AI delivers high performance across diverse environments, offering efficient processing, scalability, and reliable results. With capabilities like fast data handling, parallel job management, and precise mapping, it ensures seamless integration and accurate utility detection for various client needs.

FAST PROCESSING TIME

Processing time: up to 1 hectare per hour

VERSATILE APPLICATION

Applicability: various environments (urban, suburban, mountainous, bare land, etc.)

PARALLEL JOB MGMT

Job handling capacity: up to 15 jobs simultaneously

HIGH MAPPING ACCURACY

Mapping reliability: up to 99% of detected utilities

CUSTOM UTILITY RECOGNITION

Ability to identify types of detected utilities: possible, based on client requirements

Automated UXO detection

In civil applications

Smart autonomous aerial system for subsurface detection

This next-generation aerial platform integrates DeepGeo® software and magnetometric sensors into a fully autonomous UAV system, specifically designed to detect and classify magnetic anomalies with high precision.
Through advanced AI algorithms and automated flight control, the system performs deep, contactless subsurface scans — identifying UXO, buried utilities, and ferromagnetic structures with centimetre-level accuracy. It delivers real-time georeferenced 3D outputs, drastically reducing false positives and eliminating the need for ground access, even in complex or hazardous environments.

Operational Performance Comparison

Window	Conventional (Manual/Sled)	Aerial System + Artificial Intelligence	Productivity Gain
Per Day	≈ 8,000 m²	**320,000 m²**	**32× faster**
48 Hours (Scan Period)	≈ 16,000 m²	**640,000 m²**	**32× faster**
Land Freed (48h Data Delivery)	≈ 16,000 m² cleared	**Up to 640,000 m² cleared**	**+624,000 m² advantage**

Example – 100 ha (1,000,000 m²) Site

Approach	Estimated Time to Completion
Conventional	≈ 125 days (8,000 m²/day)
Aerial System + AI	**≈ 3 days** (1-day scanning + 48h processing)
Time Saved	**≈ 122 days faster**

Commercial impact:

- Up to 624,000 m² additional land released in the same timeframe
- Civil and infrastructure works start months earlier, accelerating project timelines
- Zero-contact operations eliminate human exposure and reduce liability risks

TARGET CUSTOMERS

01

SUBSOIL INFRA

Civil engineering and infrastructure operators requiring 3D subsurface mapping to reduce technical risks, avoid underground conflicts, and prevent unexpected costs.

02

GRID MODERNIZATION

Utilities and grid operators upgrading electric and digital networks, needing accurate and up-to-date data to plan new lines and smart grid integration.

03

RAILWAY

Railway companies and contractors working on new lines or maintenance projects, requiring non-invasive surveys to detect utilities and unexploded ordnance (UXO).

04

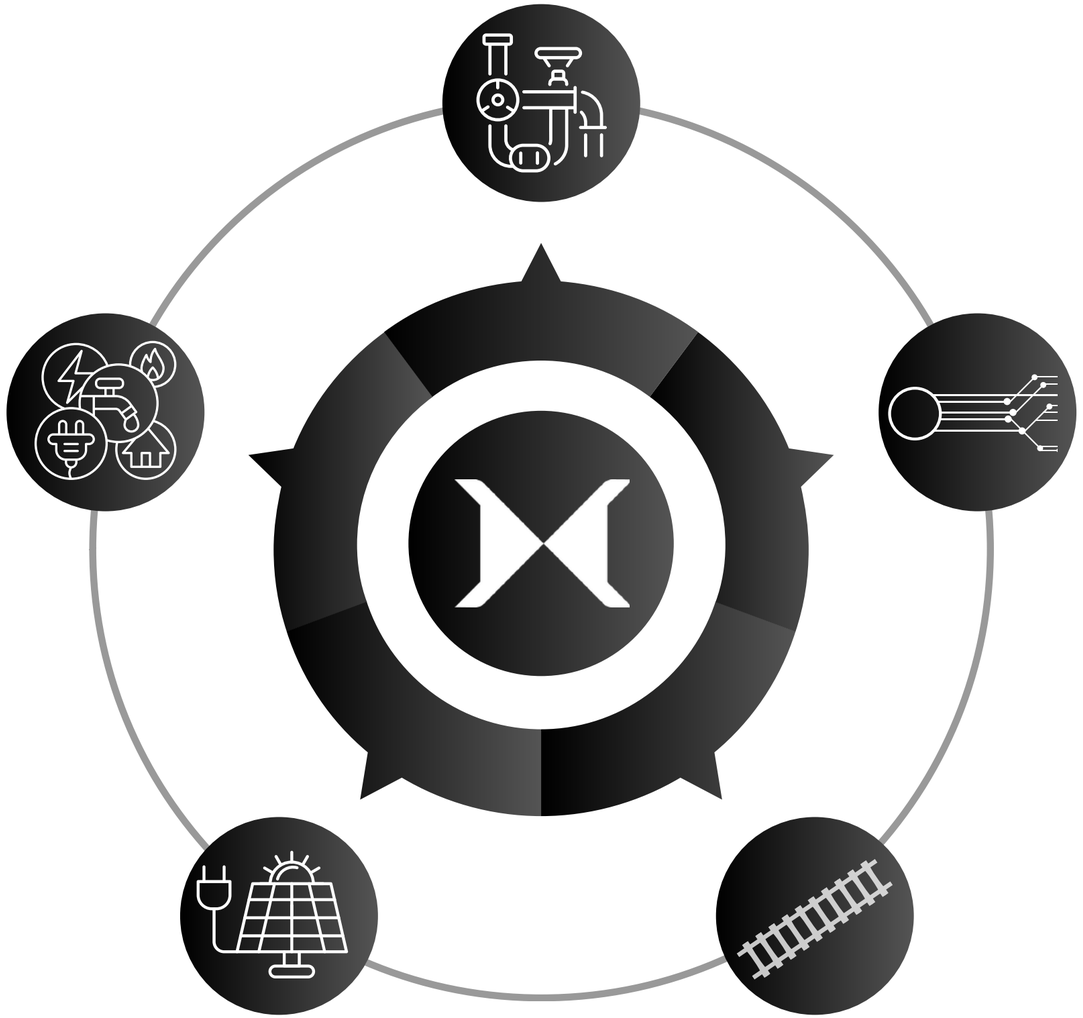
RENEWABLES

Developers of photovoltaic, wind, and geothermal plants needing geophysical analysis to assess terrain suitability and optimize site planning.

05

MULTIUTILITIES

Multi-utility companies (water, gas, electricity) managing complex networks and seeking full subsurface digitalization for maintenance, expansion, and operational safety.



TRUSTED BY:


iren


RFI
RETE FERROVIARIA ITALIANA
GRUPPO FERROVIE DELLO STATO ITALIANE


plenitude


TESLA


IG
Operation and Maintenance S.p.A.


MD


Italgas
Investiamo nel futuro dal 1837


circet
Italia


decal
renewables

RMDS®

ADNS X-HEAVY

Cutting-edge AI solutions for situational awareness in tactical environments

Hardware systems

RMDS®

UAV

50 min
Max flight time

<5 min
Deployment time

3 ha/hr
Operational coverage

15 Km
Best conditions Flight Range

RMDS®

PAYLOAD

2,5 kw
Weight

<2 min
Deployment time

3 ha/hr
Operational coverage

2h
Working duration

X-HEAVY ADNS

UAV & EXPLOSIVE

80 min
Max Flight Time

<5 min
Deployment Time

12 Kg
Payload capacity

15 Km
Best conditions Flight Range

RMDS®

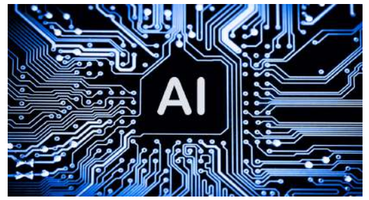
AI-Powered Mine Detection.
All in One System.

Smart autonomous connected aerial system

RMDS® Xplorer One is an autonomous UAV system able to identify surface-laid and buried explosive hazards with high accuracy while keeping personnel at a safe standoff. It provides near real-time mapping of threat locations using multispectral sensing and on-board processing. The detection of explosive threats is entrusted to the advanced artificial intelligence algorithm that works on the system's on-board computer

Multispectral detection

• High-resolution multispectral imaging
• Optimized for surface and shallow subsurface detection



Onboard Intelligence.

•Artificial Intelligence & Machine learning detection
• Ready to support C2I operations
• Jamming and Spoofing immune

Ready anywhere, anytime.

• Easy to Use Graphic User Interface
• No operator needed on the field
• Works in high-temperature, dust, or GNSS-denied zones

X-HEAVY ADNS

Modular Payload Platform. Heavy Lift.
Autonomous Operations.

Heavy-lift aerial platform with mission adaptability

X-HEAVY is a coaxial octocopter UAV platform designed for modular, multi-role operations. Thanks to its high payload and flight time, it can carry and process data from various sensors: **RGB, IR, Multispectral, Hyperspectral, LIDAR sensors, magnetometers, electromagnetometers, GPR radars, explosive release systems, micrologistics payloads**. Thanks to its open architecture, X-HEAVY enables quick payload swap-outs without requiring full system replacement, reducing downtime and maximizing mission flexibility.

X-HEAVY is fully compatible with RMDS® systems via the ADNS (Automatic Delivery and Neutralization System) module. Using RMDS-generated coordinates, X-HEAVY can autonomously deliver neutralization payloads with high accuracy. It can neutralize up to eight targets per mission with minimal operator input and from a safe distance.

Multiple Payload, Multiple capabilities

- Easy to integrate different payload and High performance OBC
- Artificial Intelligence on board for data analysis

Deployment Ready

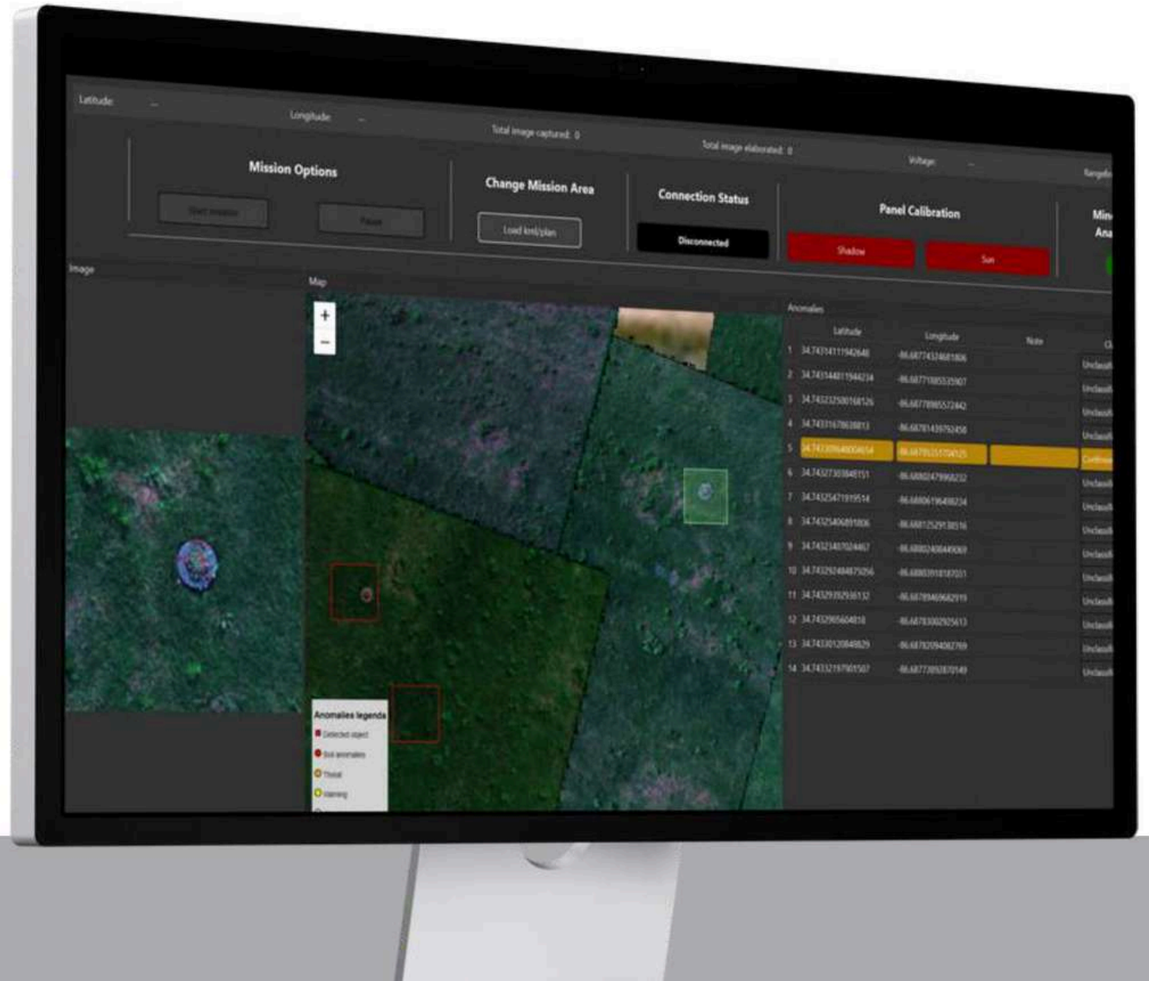
- Operative in any environment
- Operates in -20°C to +60°C
- FPV video and long-range telemetry

Autonomous Neutralization

- ADNS compatible
- Up to 8 targets per mission
- Safe-distance engagement

Software & GUI

RMDS™ software delivers **real-time insights** with AI, detecting **active** hidden threats (subsoil, camo) and **passive** threats (obstructions) faster and more accurately.



ARTIFICIAL INT. (AI)

Proprietary algorithms with no need for datasets or initial info.

VECTOR AGNOSTIC

Integrates with commercial and military UAVs and UGVs

REAL TIME DETECTION

Delivers immediate, actionable insights.

MATERIAL AGNOSTIC

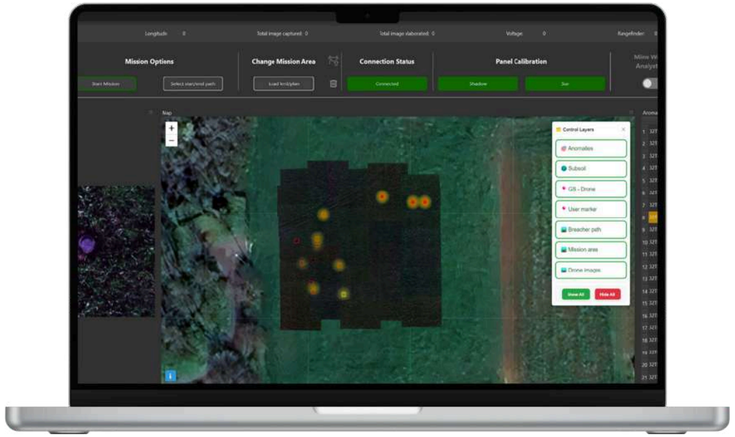
Identifies any threats without prior data or limitations.

CLEARANCE SPEED

Clears 1 hectare in just 20 minutes.

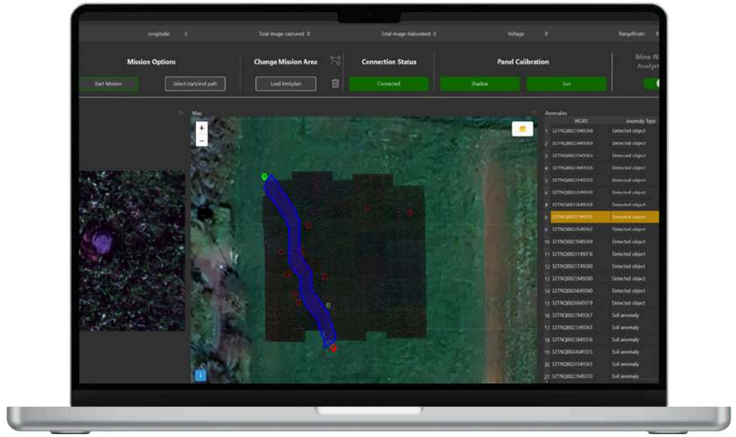
Software & GUI

Mission-Critical Control Capabilities



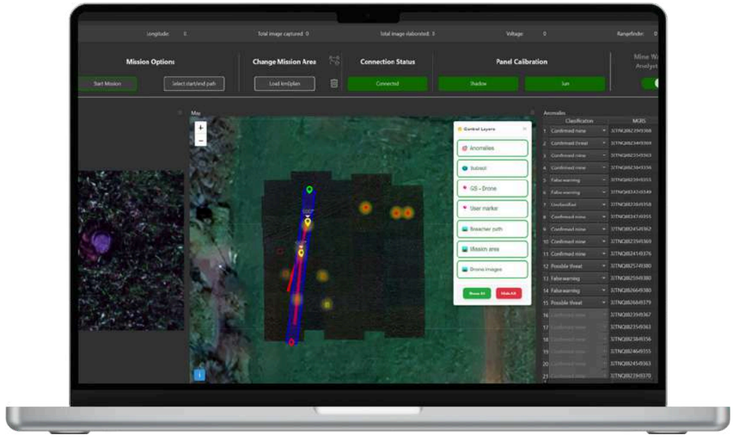
1. Real-Time Threat Detection & Analysis

The RMDS® GUI enables the operator to monitor surface and subsurface threats in real time. Visible hazards and subsurface anomalies are automatically flagged, with AI-assisted classification. The operator retains full authority to review, validate, and manage detected targets through intuitive tools for threat assessment and prioritization.



2. Mark & Avoid – Safe Route Planning

Post-detection, the system allows operators to define safe corridors (point A to B) through threat-mapped zones. This ensures silent, risk-free movement of personnel or assets, enabling secure troop advancement or logistical operations without triggering hidden dangers.



3. Break – Targeted Neutralization

Operators can initiate precision engagement actions directly from the interface. This includes launching explosive charges or deploying ADNS drones to autonomously neutralize threats from a safe distance, ensuring maximum operational safety and tactical efficiency.

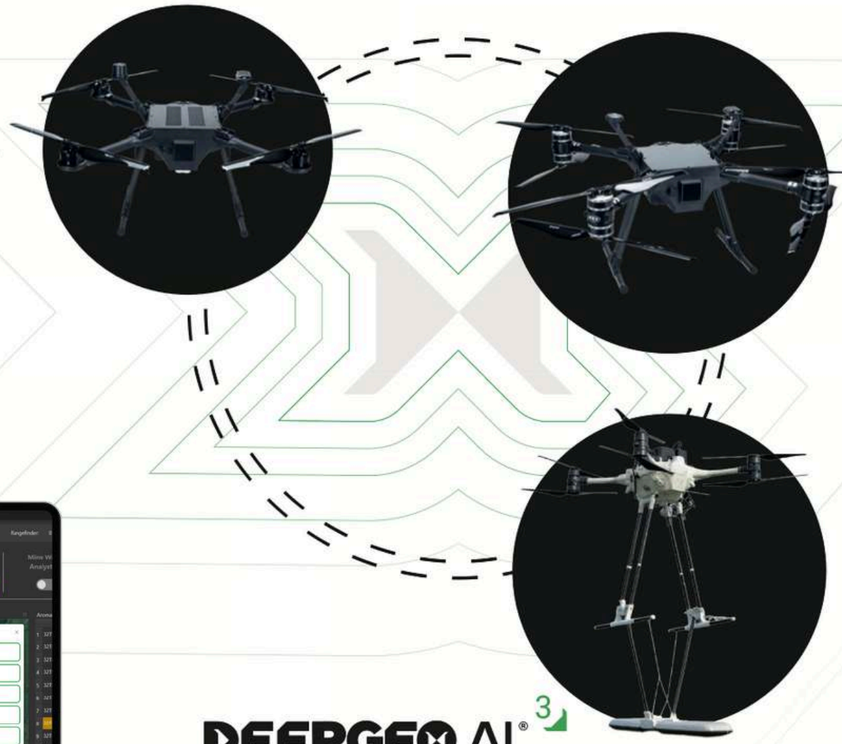
Full-stack Technology

For subsoil Analysis & Clearance

RMDS® 1

RMDS - Explosive Threat Detection (0,00 m - 0,30 m)

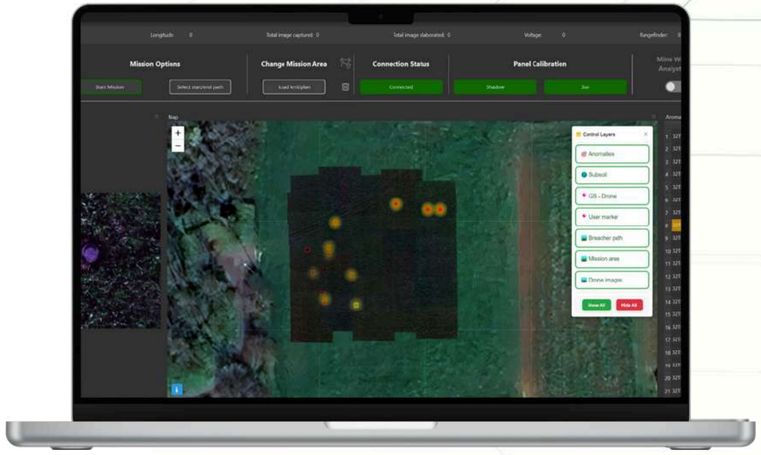
- **Near Real-time detection** of mines, IEDs and surface threats
- Drone-based, **non-invasive** scanning
- **Onboard AI** with no preloaded datasets
- **Fast deployment,** minimal human involvment



2 ADNS®

ADNS - Autonomous Neutralization System

- Remote **neutralization** of confirmed anomalies
- **Automated** UAV/UGV platforms
- **Safe,** targeted intervention without operatore exposure
- **Seamless** link between detection and deep analysis



DEEPGEO.AI® 3

DEEPGEO.AI - Deep Subsoil Analysis (0,30 m - 8 m)

- **AI-powered 3d processing** of magnetometric data
- **Detects, classifies** and **locates** deep-buried OXO
- Identifies critical subsurface **infrastructures**
- Delivers CAD/ GIS-ready outputs with high spatial accuracy

Trusted by:

15

OFFICIAL DEMOS WITH INTERNATIONAL ARMY

99.7%

DETECTION RATE

Different active threats, covered, visible, buried, camo, plastic, metal, wood, glass.

2"

PROCESSING TIME

Near-real-time data processing and classification onboard.

"This is one of the first looks we have had at something that is UAS-borne that can detect hazards without putting Soldiers into the threat"

Sgt. Kyle Henry - 16th Brigade Engineer Battalion @ MSPIX24 (US. Army - FT. Leonard Wood)

DEEPGEO.AI®

Case studies & Customers

SCALING UTILITY MAPPING THROUGH SAAS

Europe's largest gas distributor, is currently running its flagship program 3D Asset Mapping. The project aims to digitize and georeference over 5,000 km of underground gas networks per year. Initial feasibility studies quickly revealed that relying solely on field technicians and geophysicists would be impractical at this scale — both in terms of manpower and time.
To address this bottleneck, the company initiated a proof of concept (POC) on 400 km of network, integrating Xplora's SaaS platform DEEPGEO.AI. Unlike conventional approaches, Xplora did not mobilize field crews. Instead, the company sown proprietary sensors acquired the raw data, which was then uploaded to Xplora's cloud-based processing environment.

CHALLENGE

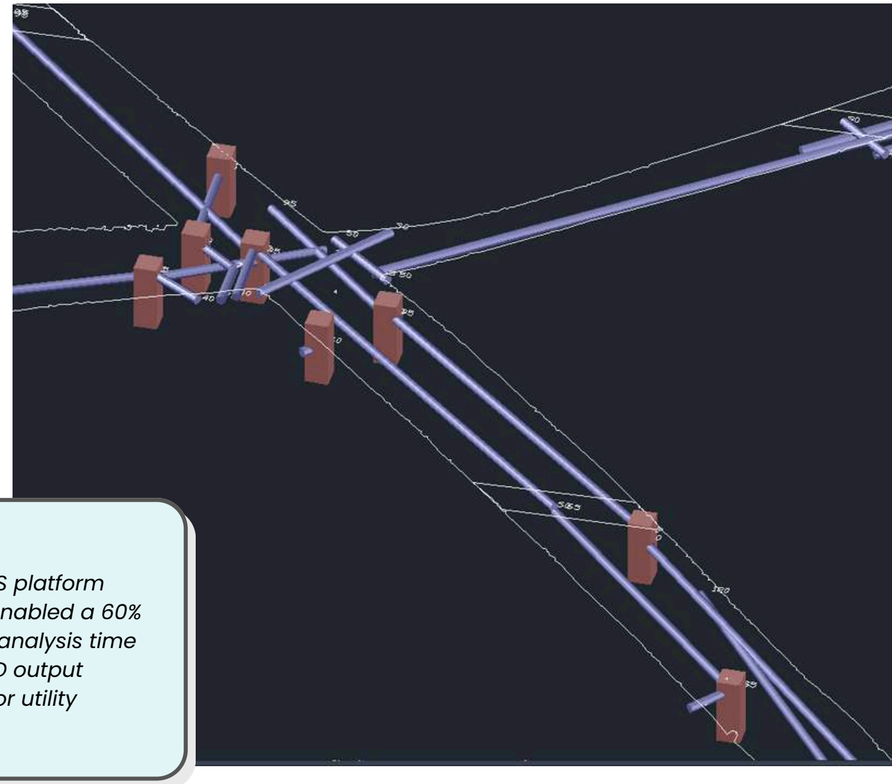
Traditional UXO risk assessments struggle to deliver actionable results in post-war contaminated areas. The inability to distinguish harmless ferromagnetic noise from true threats leads to inflated remediation scopes, regulatory deadlock, and escalating costs. For EPC contractors, this means stalled projects, lost revenue, and increasing exposure to contractual penalties.

DATA PROCESSING WORKFLOW

- The company collected data using its proprietary equipment.
- The dataset, comprising several terabytes of raw subsurface signals, was transmitted to Xplora's DEEPGEO.AI platform.
- Xplora's AI pipelines processed and classified the data, filtering noise, and reconstructing continuous 3D underground networks.
- Results were delivered back to the company in 4 working days, fully validated by its in-house technical team.

OUTPUT

- A 3D GIS-ready underground map of 400 km of pipeline networks.
- A 60% reduction in analysis timelines, compared with traditional workflows.
- A demonstration of true scalability: data can be captured by non-specialist crews and processed remotely, eliminating dependence on scarce geophysical expertise.



IMPACT:

Xplora's SaaS platform DEEPGEO.AI enabled a 60% reduction in analysis time and faster 3D output generation for utility mapping.

CLEARING THE PATH FOR SAFE CONSTRUCTION WITH AI-DRIVEN UXO MAPPING

Subsurface utility mapping in dense urban areas is one of the most challenging yet high-impact applications of Xplora's AI-driven technology. In cities like Bologna, where infrastructure overlaps with historic layers and modern utilities, accurate detection is critical to avoid costly strikes, delays, and regulatory setbacks.
In September 2024, Xplora was engaged by one of the most important multiutilies company to perform advanced underground mapping beneath asphalted urban terrain in Bologna. The goal was to detect and map sewer networks and underground infrastructure up to 7 meters deep, ensuring seamless integration into ongoing modernization works.

CHALLENGE

Traditional methods often fail in such environments due to noise and mixed subsoil layers. In this case, variable grain size and urban backfill created severe interference, which would have rendered manual analysis ineffective. Xplora's proprietary neural networks filtered the raw signals, isolating meaningful anomalies and reconstructing utility geometries with high fidelity.

ON-SITE DATA ACQUISITION

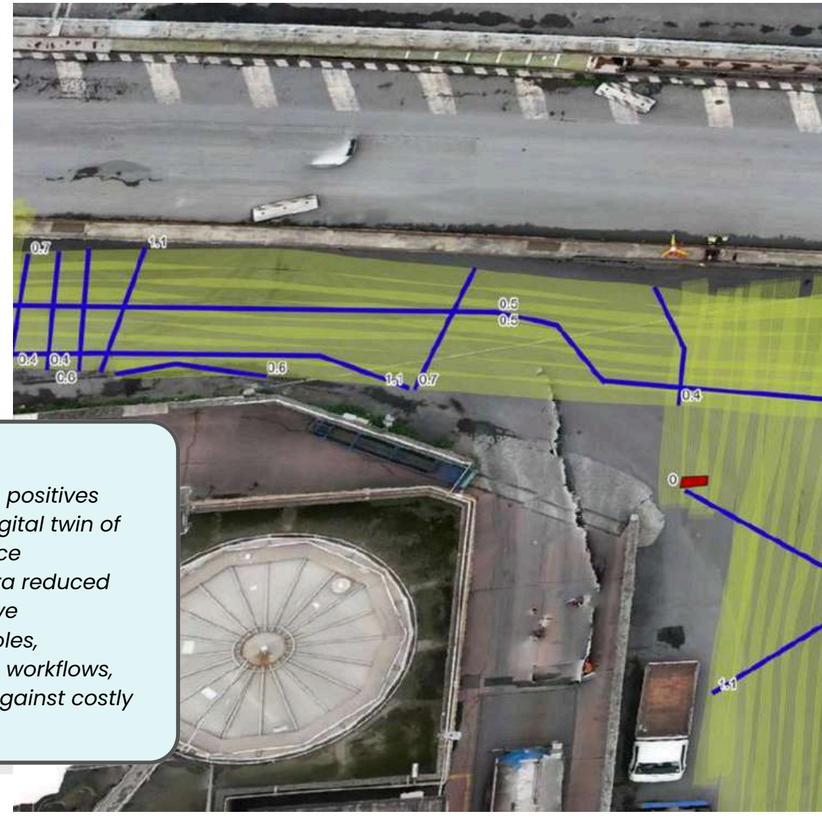
Traditional methods often fail in such environments due to noise and mixed subsoil layers. In this case, variable grain size and urban backfill created severe interference, which would have rendered manual analysis ineffective. Xplora's proprietary neural networks filtered the raw signals, isolating meaningful anomalies and reconstructing utility geometries with high fidelity.

OUTPUT

The deliverables included:

- A GIS project with 3D geometries of the underground network down to 7 meters.
- A .dwg file for CAD integration, supporting detailed design phases.
- Georeferenced photogrammetry overlays, ensuring full geospatial accuracy.

These outputs were immediately usable by the multiutility's engineering team, enabling faster permitting, reduced design risks, and compliance with Italian ARPA standards for environmental and infrastructure reporting.



IMPACT:

By eliminating false positives and producing a digital twin of Bologna's subsurface infrastructure, Xplora reduced the need for intrusive geophysical boreholes, accelerated design workflows, and safeguarded against costly project overruns.

CLEARING THE PATH FOR SAFE CONSTRUCTION WITH AI-DRIVEN UXO MAPPING

RFI must deliver large-scale projects across areas still contaminated by World War II ordnance. In Italy, the Legislative Decree 81/2008 (TULPS) requires a mandatory UXO risk assessment before excavation.
In Reggio Calabria, a photovoltaic plant risked cancellation after traditional surveys flagged hundreds of anomalies. With Xplora's non-invasive AI-driven approach, irrelevant ferromagnetic noise was filtered out and the site was cleared in less than two weeks, at a fraction of the cost.
This transformed an unfeasible project into a viable investment, accelerating permitting and enabling safe construction.

CHALLENGE

Traditional field-led geophysical surveys are too resource-intensive for network-wide digitalization. Mapping 5,000 km per year would require hundreds of crews and months of manual interpretation, creating a structural bottleneck.

ON-SITE DATA ACQUISITION

Xplora carried out a fully non-invasive survey with drone-based photogrammetry and electromagnetic scanning. Continuous snake-pattern sweeps ensured full coverage despite heavy ferromagnetic contamination. Proprietary AI filtering then distinguished true UXO threats from harmless residues, enabling immediate CSE validation without invasive drilling.

OUTPUT

Xplora delivered a georeferenced 3D subsurface model integrated into standard GIS and CAD environments, clearly distinguishing between benign ferromagnetic residues and actual UXO risks. The final map reduced several hundred anomalies flagged by traditional surveys to fewer than ten validated points of interest, all classified as non-critical.

IMPACT:

Xplora reduced hundreds of flagged anomalies to fewer than 10 validated points, cutting remediation costs and clearing the site in under two weeks.