5th WATER LOSS BALKANS FORUM AND EXHIBITION

31 August - 1 September 2023

Constanta Exhibition Pavilion, Romania

WORKSHOP

Relevant IT solutions and smart water networks

AGS WaterSolutions

TADECO TECHNOLOGY

TADECO CONSULTING

AQUASIS

2023

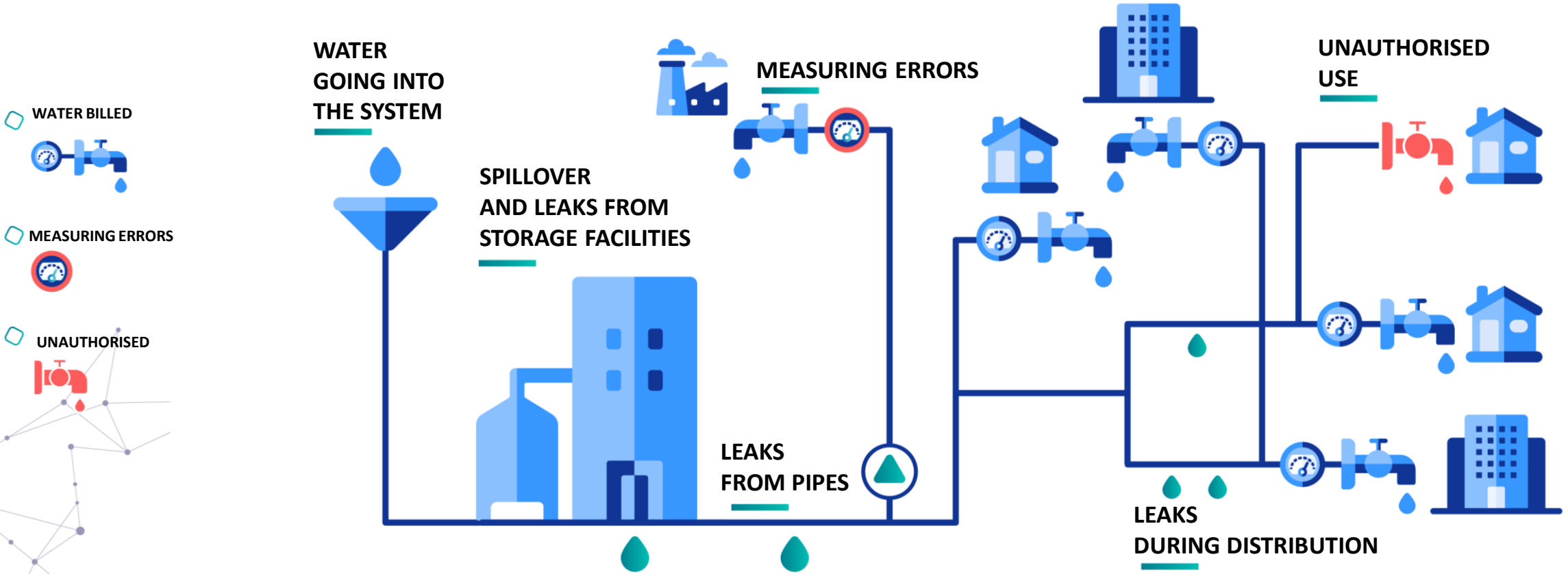
INDEX

01.

Introduction - Waterloss Reduction Plan

1. Introduction – Water loss Reduction Plan

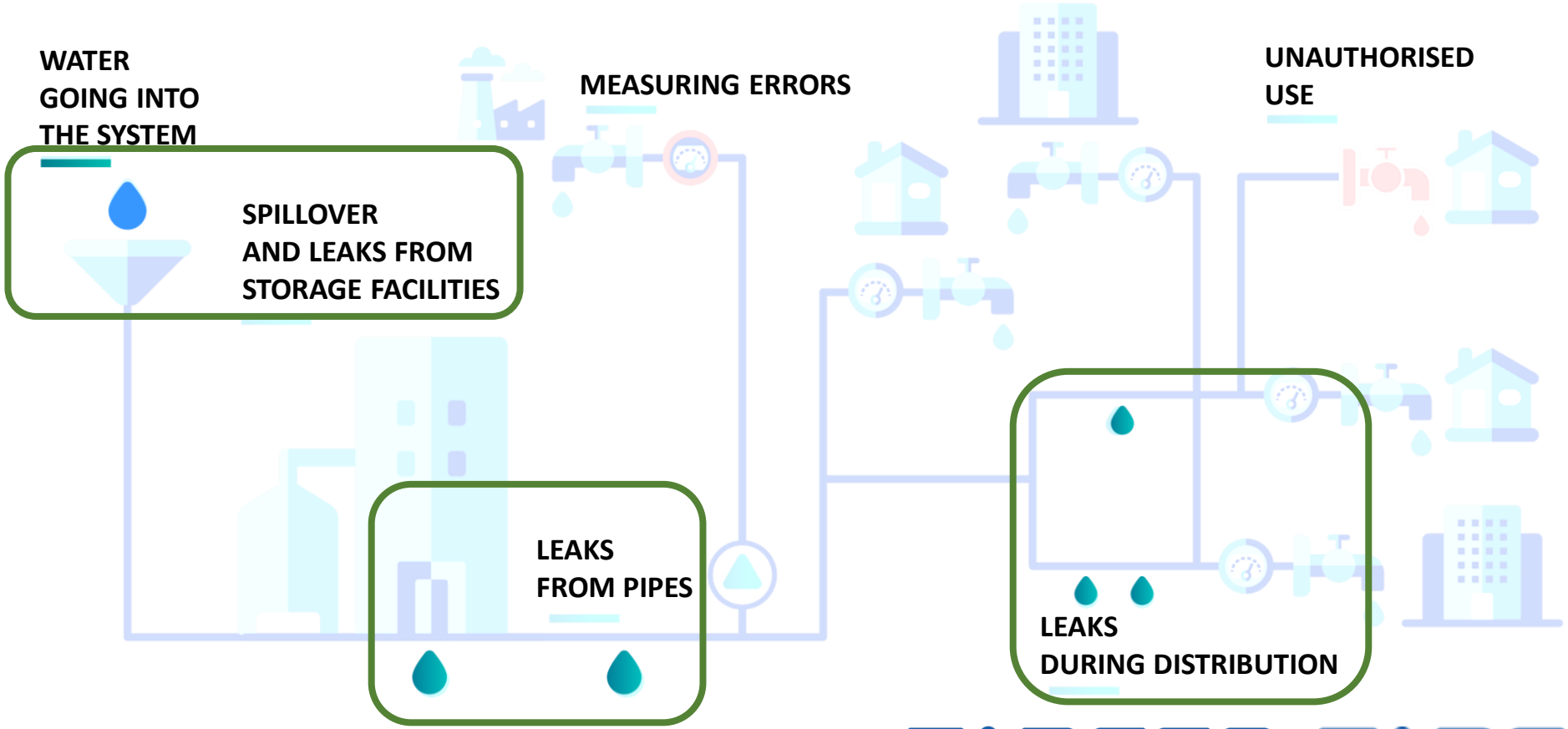
Non-Revenue Water is one of the main inefficiencies of water services management bodies.



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

1. Introduction – Water loss Reduction Plan

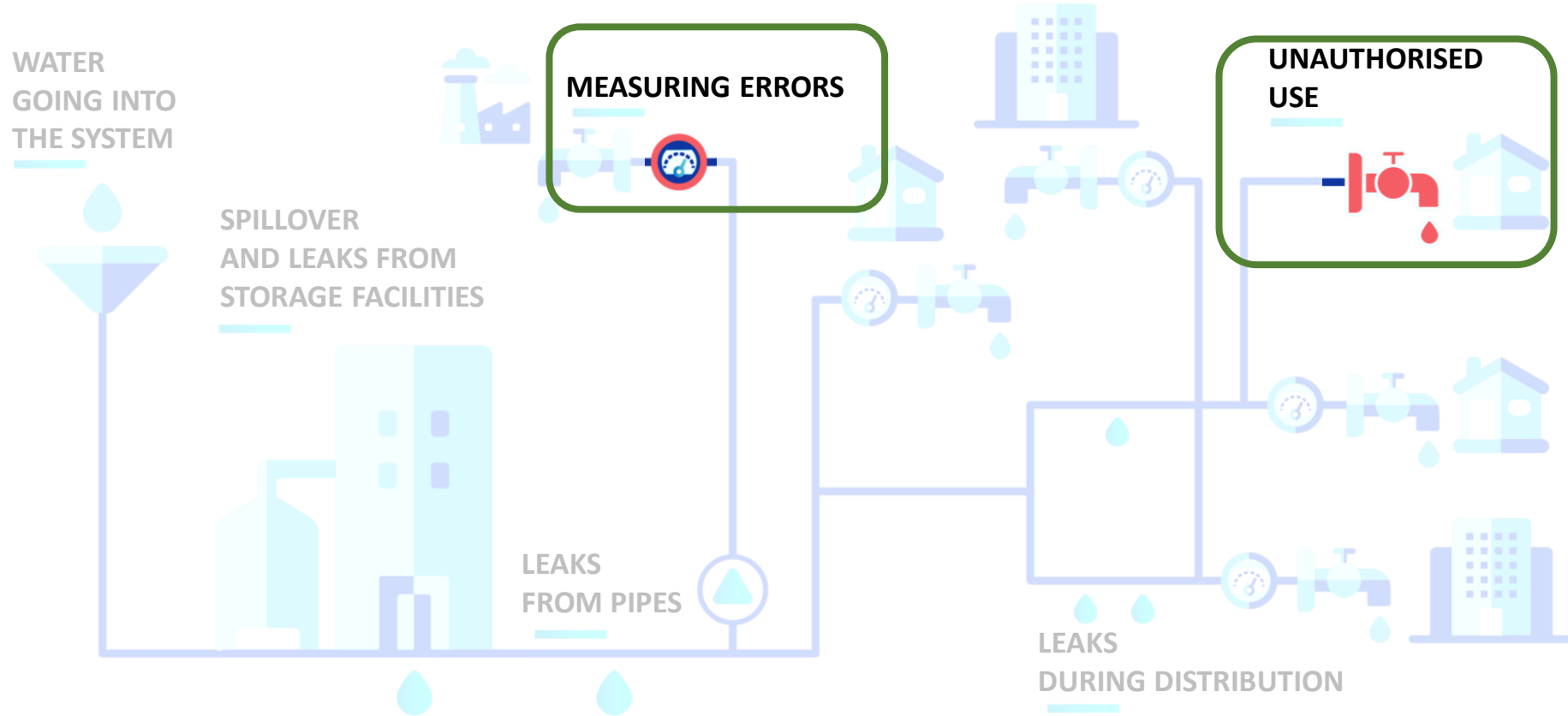
REAL LOSSES.



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

1. Introduction – Water loss Reduction Plan

APPARENT LOSSES.



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

1. Introduction – Water loss Reduction Plan

Typical waterloss reduction pan

Phase 1 – Evaluation of the initial situation

Phase 2 - Definition of the strategy to combat losses

Phase 3 - Definition of District Measure Areas (DMAs)

Phase 4 – Contract for the Construction of DMAs

Phase 5 - Actions to control physical losses

Phase 6 – Systems management with DMAs

Phase 7 - Evaluation of results

1. Introduction – Water loss Reduction Plan

Phase 1 – Evaluation of the initial situation

GOALS

Obtaining operational and financial indicators of the system that allow an adequate characterization of the existing losses and leaks, most relevant types of losses and their origins.

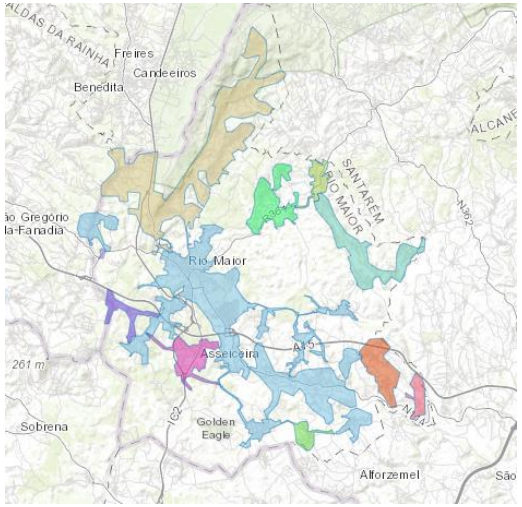
Definition of a strategy to fill in the missing information, both regarding the physical characterization of the systems, as well as the operation and maintenance data, and also regarding the registration of customers.

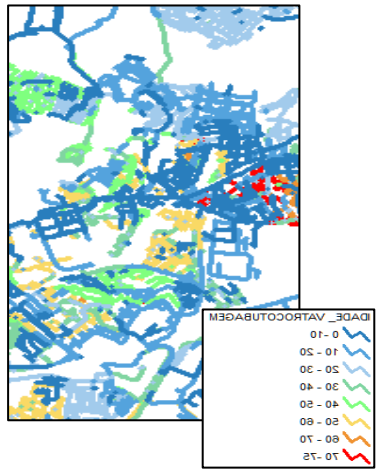
1. Introduction – Water loss Reduction Plan

Phase 1 – Evaluation of the initial situation

Hydraulic systems

- Knowledge of infrastructure;
- Evaluation of the existing register (content and form) regarding the physical and geographical characterization of the organs and infrastructures that make up the water distribution systems, namely, pipelines, installations, maneuvering organs, security agencies, instrumentation, meters, points of consumption, etc.;
- Definition of a strategy for filling in missing information and files.





Water consumption

- Knowledge of customer consumption – Customer System;
- Customer Registration;
- History of complaints – water cuts, low pressures;
- Volumes of water consumed (daily, monthly, annual, days of higher consumption, etc.);
- Zoning of consumption areas (readings of meters combined with the areas of the systems);
- Definition of a strategy for the completion of information and archiving.

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

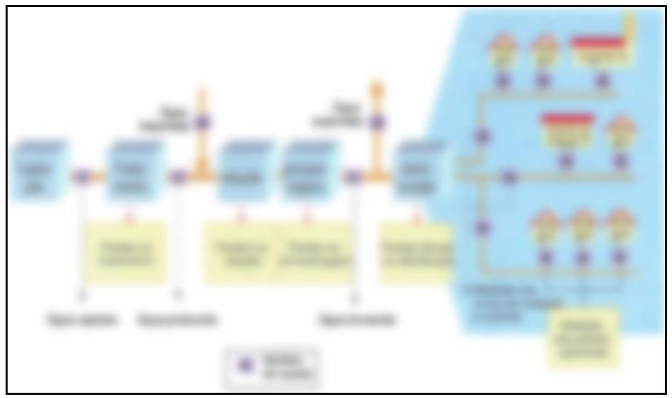
1. Introduction – Water loss Reduction Plan

Phase 1 – Evaluation of the initial situation

Water balance and indicators

Daily periods of operation of funding, ETA e EE, throughout the year, with indication of start-up and stop times;

- Operating regime of the main switching valves;
- Variations in water levels in reservoirs;
- Occurrences with implications for water failures or low pressures;
- Water losses per connection (m3/connection/year);
- Water losses per pipe length (m3/km.day)
- Apparent losses(%);
- Apparent losses per volume of water entering the system (%);
- Real losses per connection (l/connection.day);
- Real losses per pipeline length (l/km.day);



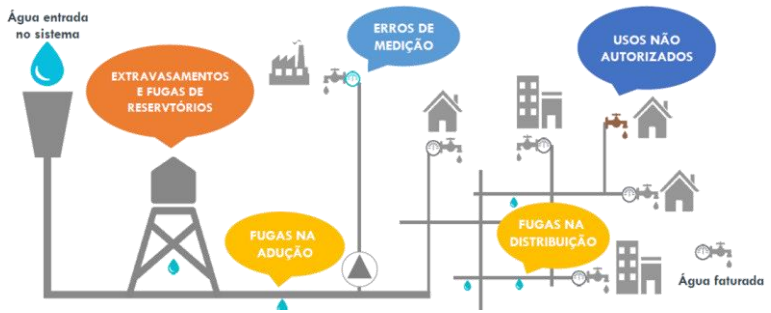
AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

1. Introduction – Water loss Reduction Plan

Phase 2 - Definition of the strategy to combat losses

Priority areas for action

- Selection of areas of intervention, taking into account the preliminary conclusions of Phase 1 and, in particular, based on the knowledge of the technicians on:
  - apparent / commercial losses
  - current frequency of ruptures;
  - age and materials of the network; soil type (permeability);
  - groundwater level.
- **Assumption: for the selected areas, the existence of a customer management system, a commercial loss reduction solution and a geographic information system**



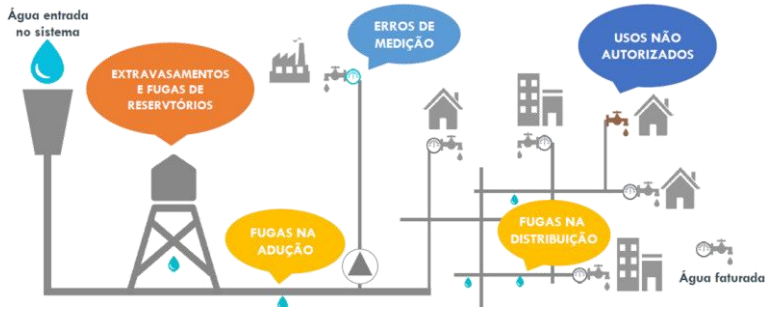
AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

1. Introduction – Water loss Reduction Plan

Phase 2 - Definition of the strategy to combat losses

Preliminary characterization of the system

- Identify and characterize all the limits of the selected system, namely reservoirs and lifting stations;
- Identify all supply points of the selected system, as well as water transfer points to other systems; provide the identified sites with flow or level measuring equipment enabling mass balances to be established;
- Calculate the water balance and indicators for the selected system.



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

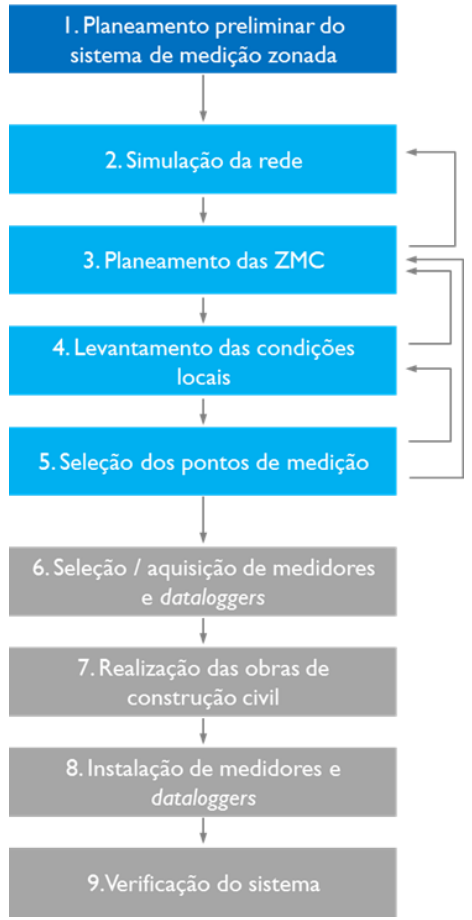
1. Introduction – Water loss Reduction Plan

Phase 3 - Definition of District Measure Areas (DMAs

GOALS

Sectorize and equip the selected system for active loss control.

Implement a mathematical simulation model of the hydraulic operating conditions of the selected system.

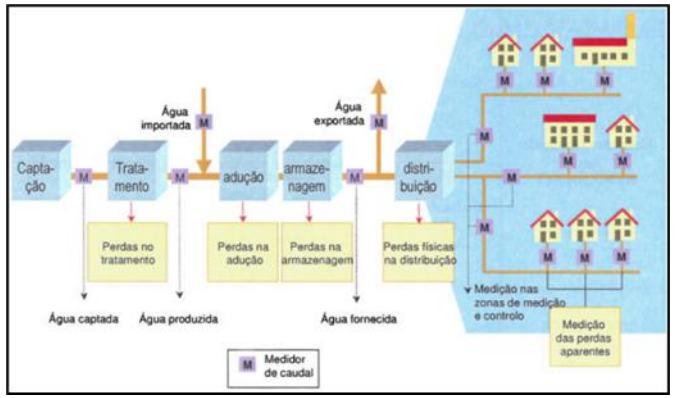


1. Introduction – Water loss Reduction Plan

Phase 3 - Definition of District Measure Areas (DMAs

Develop mathematical model

- Development of a mathematical model of simulation of the hydraulic operating conditions of the system for its original configuration;
- Identification of constraints in the existing system, with the possibility of localized correction, even before the establishment of the DMAs.



Planning of DMAs

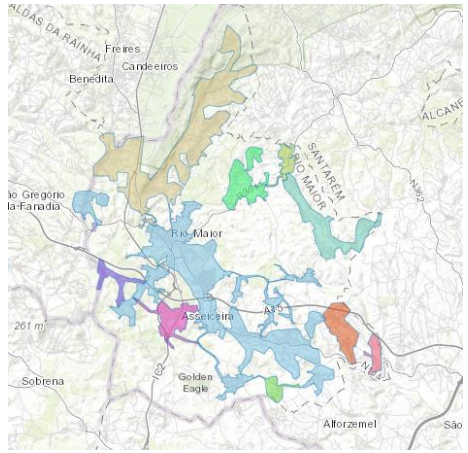
- Definition of criteria for the establishment of DMAs:
  - reservoirs - natural DMAs;
  - dimension (500 extensions);
  - minimization of measurement points.
- Definição da setorização da rede e dos pontos de medição de caudal e pressão.

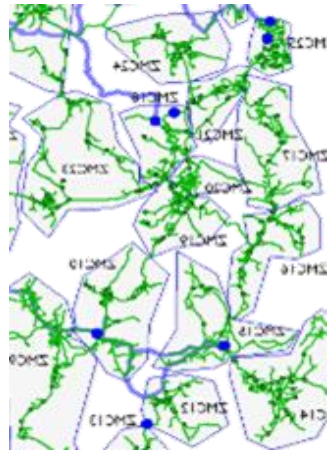
1. Introduction – Water loss Reduction Plan

Phase 3 - Definition of District Measure Areas (DMAs

Establish DMAs

- Survey of local conditions;
- Exact selection of measuring points;
- Selection / acquisition of the type of flow meter and the data loggers to be used;
- Realization of civil construction works and installation of flow meters and dataloggers;
- verification of the system, in particular as regards the tightness and proper functioning of the flow meters;
- Establishment of a data repository of the DMAs.





1. Introduction – Water loss Reduction Plan

Phase 4 – Contract for the Construction of DMAs

GOAL

Materialize the sectorization project that allows monitoring and controlling flows and pressures.

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

1. Introduction – Water loss Reduction Plan

Phase 5 - Actions to control physical losses

GOAL

Reduction of real losses. This activity should be developed from day one, independently of the other actions. After completion of the construction of DMAs the research will be more targeted.

Pressure management

- Creation of pressure management zones – PMZ and installation of automatic valves with dynamic pressure control – PRV;
- Proper selection of the type of PRV.

Location of leaks

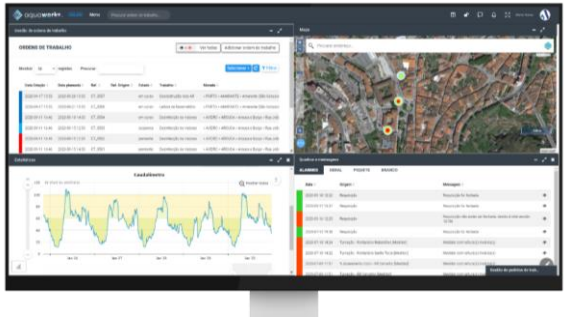
- Alarm monitoring - FLOWISE;
- Approximate location: sub-zoning or progressive closure (use of mobile measuring equipment in temporary campaigns);
- Exact location: acoustic sounding; acoustic correlation, CCTV;
- Acoustic logger and correlator;
- Continuous detection/location.

1. Introduction – Water loss Reduction Plan

Phase 6 – Systems management with DMAs

GOAL

Effective management of a water distribution system with zoned metering.



Organize human resources and operationalization of network management services

Establishment of a loss control team and installation of digital solution to perform the following functions:

- information collection;
- interpretation/management of information;
- location/detection of leaks;
- repair of leaks.

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

1. Introduction – Water loss Reduction Plan

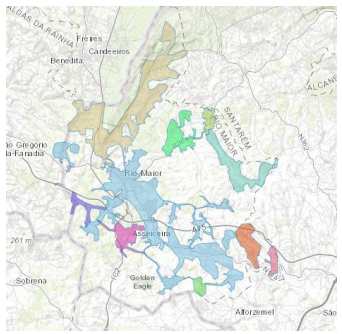
Phase 6 – Systems management with DMAs

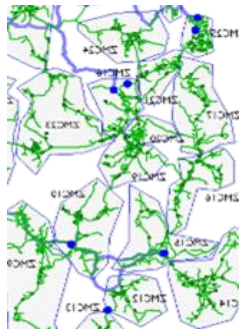
Establish indicator control system

- Selection of monitoring techniques: measurement of night flows and measurement of daily flows;
- Analysis of flow regime and consumption patterns
- Identification and location of large consumers and their consumption regime;
- Calculation of the BL (Baseline) - losses that occur after the repair of all leaks detected from the measurement of night flows.

Establish routine operations

- Routine monitoring – observation of night flows, definition of alerts and interpretation of results.
- Programme of actions for the maintenance of the ZMC (new connections) of the ZMC (new connections), of the measuring equipment.





AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

1. Introduction – Water loss Reduction Plan

Phase 7 - Evaluation of results

GOAL

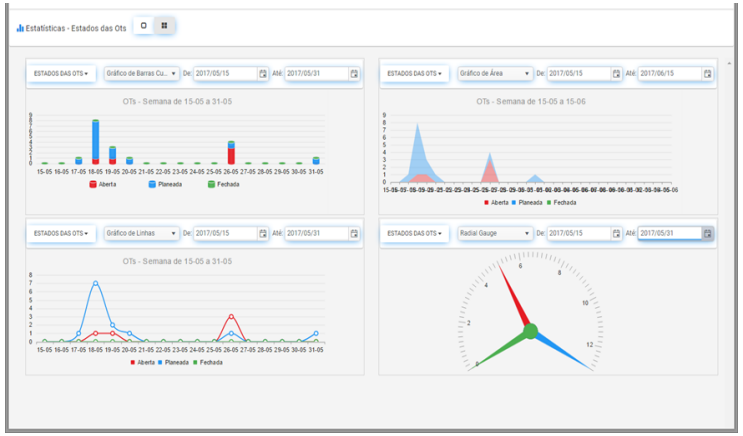
Assess the efficiency of the use of the resources allocated and the effectiveness of the measures put in place, comparing the initial situation of the period under review with the final one.

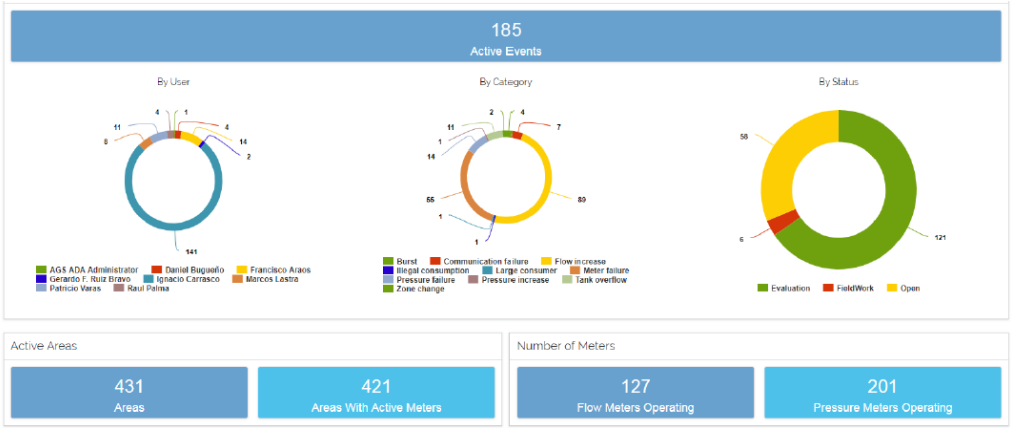
1 – Evaluation of the cost of active loss control.

2 – Comparison of objectives and results.

3 – Analysis of deviation and identification of areas for improvement.

4 – Progress report.





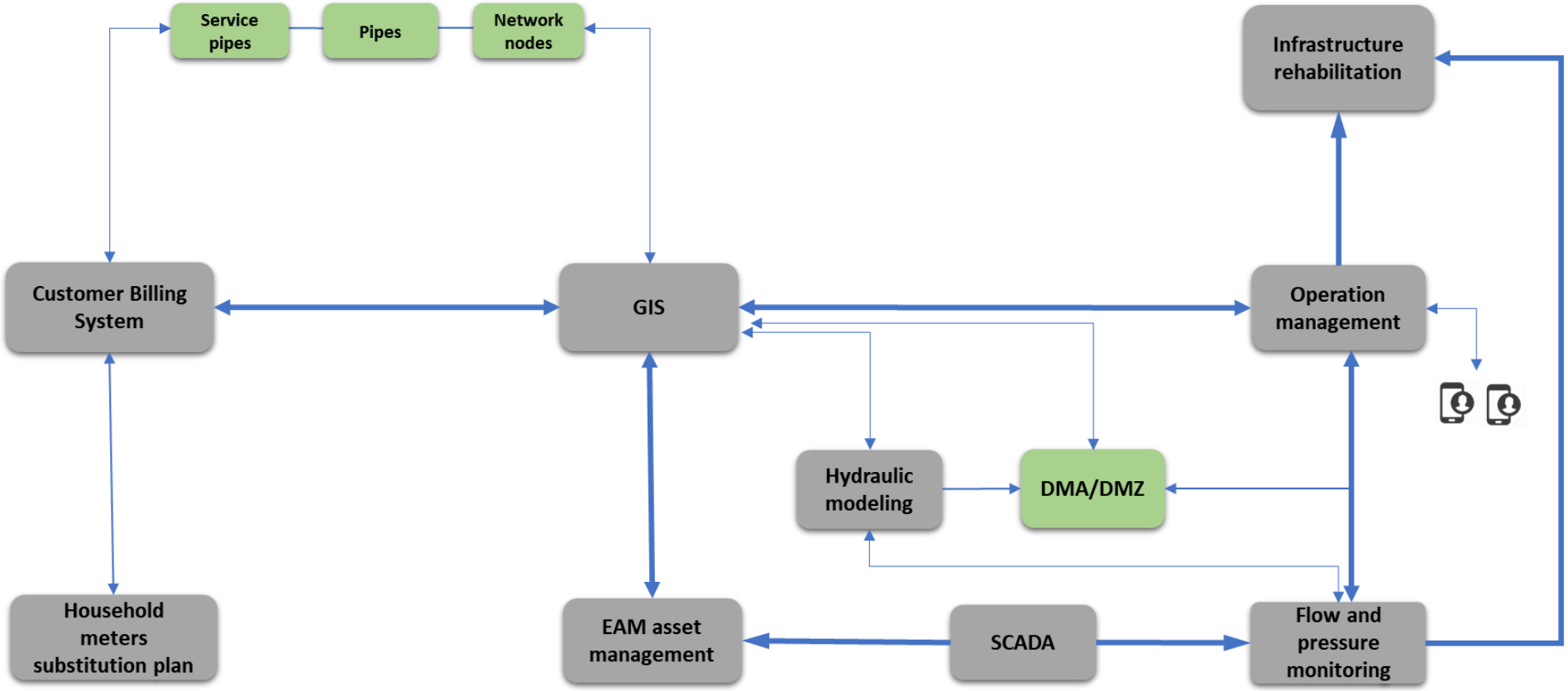
AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

02.

Software solutions

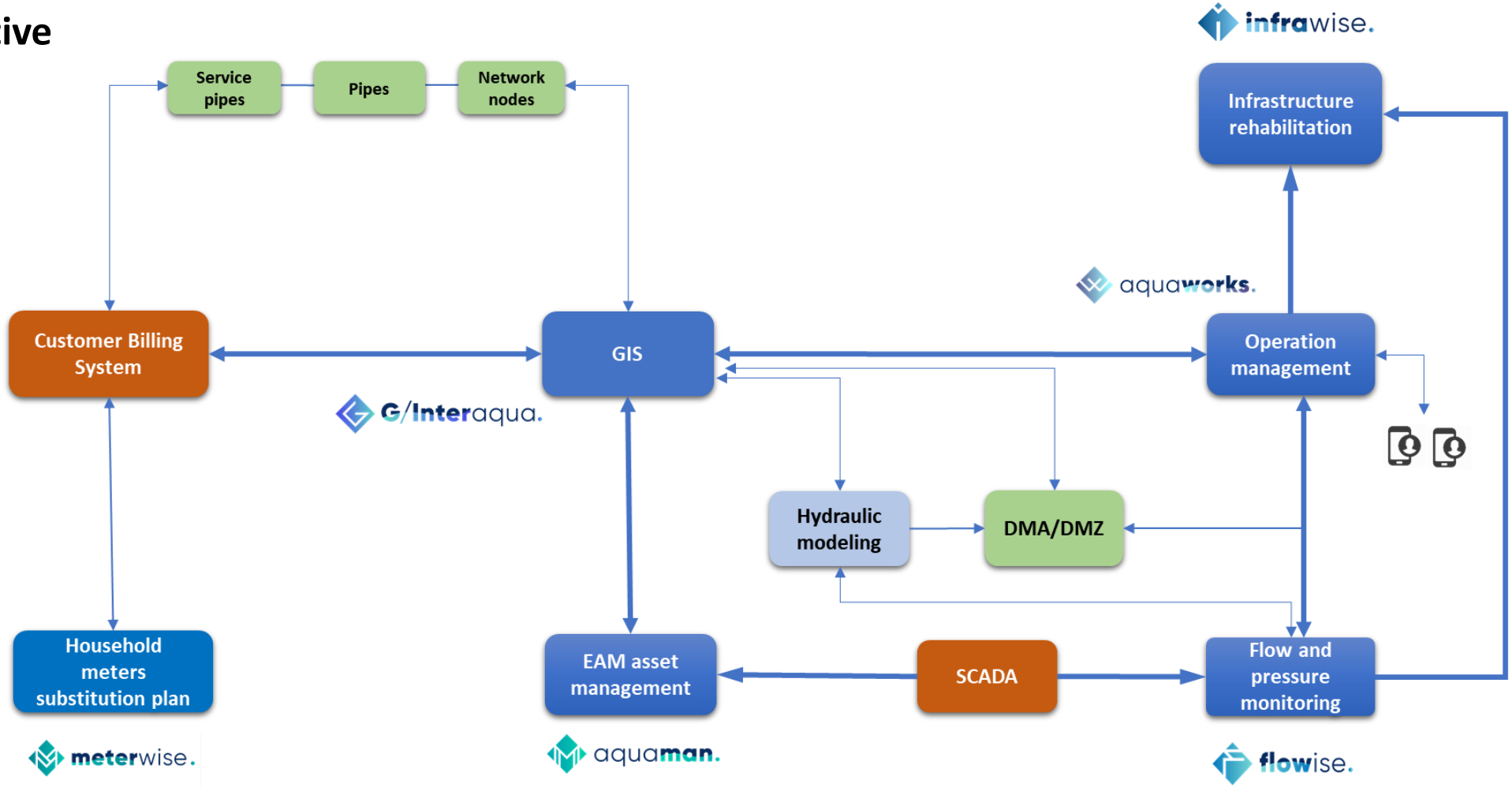
2. Software solutions

General perspective



2. Software solutions

General perspective



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

General perspective

Know your assets /network → Operate → Improve efficiency → Improve planning → Be resilient and sustainable

G/Interaqua.
GIS solution dedicated to the management of hydraulic infrastructures

aquaworks.
f networks and infrastructure operational management

flowise.
Real-time monitoring of water and sanitation networks.

aquaman.
Integrated asset and maintenance management.

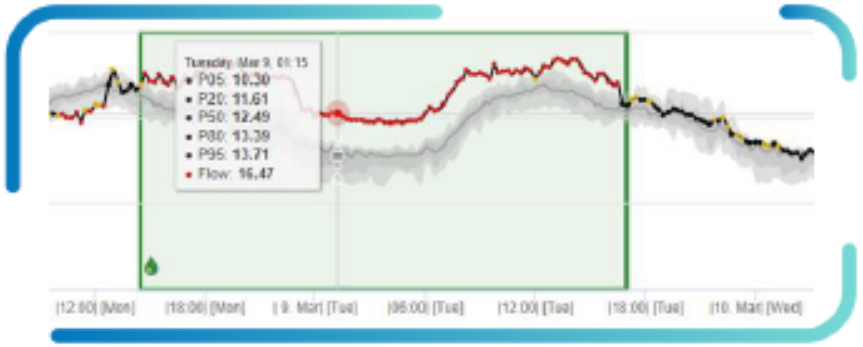
meterwise.
Integrated meter management.

infrawise.
Investment optimization for infrastructure rehabilitation.

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

flowise.



DATA COLLECTION

Pressure, flow, temperature, rainfall, chlorine, conductivity and other variables from SCADA or any other data bases

INTEGRATED ANALYSIS

Historical patterns created from meter readings and compared with real-time readings

EVENTS GENERATION

Events are automatically generated according to user defined rules and notifications are sent via app or email

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

flowise.

DMA and meters

READINGS
View meter readings in a **normalized time step**

DIFFERENTIATED ANALYSIS
Differentiated analysis for **weekdays and weekends**

IDENTIFICATION OF ANOMALOUS READINGS
Easily identify **anomalous readings by color** - values that differ from expected behavior (pattern)

PATTERNS
Compare readings with typical pattern and historical behavior

NIGHT FLOWS
Differentiated analysis for the night period - **minimum night flows**

DMA ANALYSIS
Analyze **data per DMA** (meters' balance)

SELECTION OF PATTERN TYPES
Select **different pattern types** (mean, log-normal, ...) and **periods** (15 minutes, hourly, daily, daily minimum) for visualization

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

flowise.

Event management

CLASSIFICATION

Classify each event by **category** (e.g. **burst and meter failure**) or **severity** (green, yellow, red)

MANAGEMENT

Define a **person responsible** for event management

STATUS

Define **event status** (evaluation, open, field work, closed)

VISUALIZATION

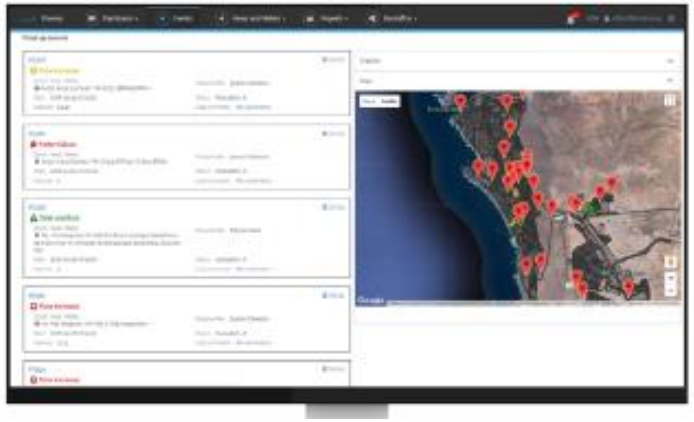
View all events in a **list** or **map**

WORKFLOW

Workflow adapted to the utility

REMOVAL

Possibility of removing events from the **pattern**



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

flowise.

Event management – Water Supply

WATER SYSTEM CATEGORIES

- Burst
- Flat readings
- Flow decrease
- Flow increase
- Maintenance Work
- Flow meter failure
- Pressure increase
- Pressure decrease
- Pressure meter failure
- PRV deregulation
- Zone change
- Work Order

Data failure

Minimum flow increase

Pipe burst and leaks

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

flowise.

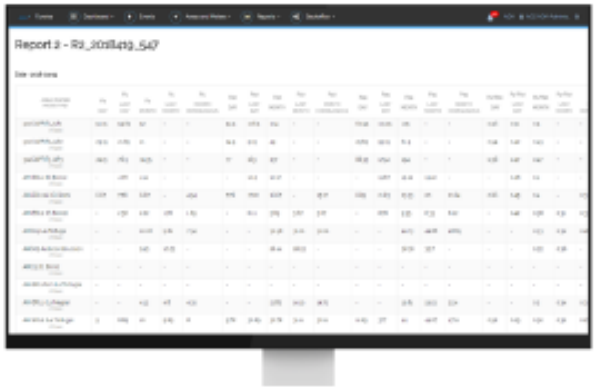
MANAGEMENT REPORTS

Production of reports to **support management**

MONITORING

Monitor systems' **operation** (water loss volumes, event duration, operating meters, open events, ...)

Reports



ASSESSMENT

Assess **systems' behavior** over time

CRITERIA

Apply criteria to get meaningful **information**

EXPORT

Data **export** to Excel

AGS WaterSolutions

AQUASIS

TADECO TECHNOLOGY

TADECO CONSULTING

2. Software solutions

meterwise.

Global metering errors and alarms

Error evolution and meter performance

Geographic Analysis

Optimised renewal plans, including financial analysis

WEB APPLICATION

Connecting directly and safely to the information systems, with duplication of data

METER DETECTION

Anticipates the detection of potentially stopped meters

MEASURING ERROR

Calculates the measuring error and monitors the under-registration of volumes and loss of billing

DATA ANALYSIS

Provides an analysis of historical data and identifies anomalous consumption

METER RENEWAL

Allows the meter renewal programmed based on the optimal useful life of each meter to be improved

FINANCIAL ANALYSIS

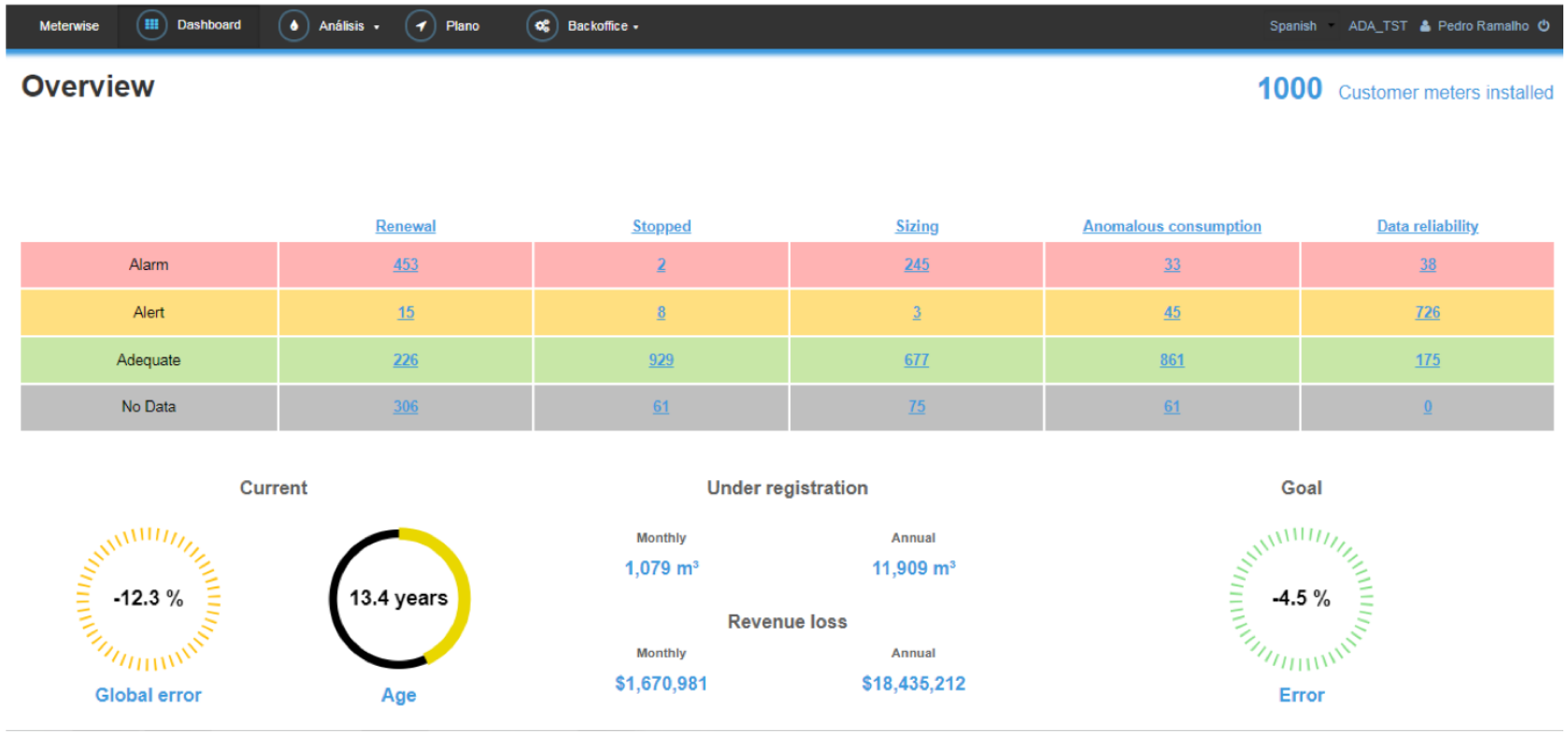
Carries out a financial analysis and provides for high returns on investment

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

meterwise.

Specific management of subsets of meters: meters identified as alarm, alert, adequate or without data

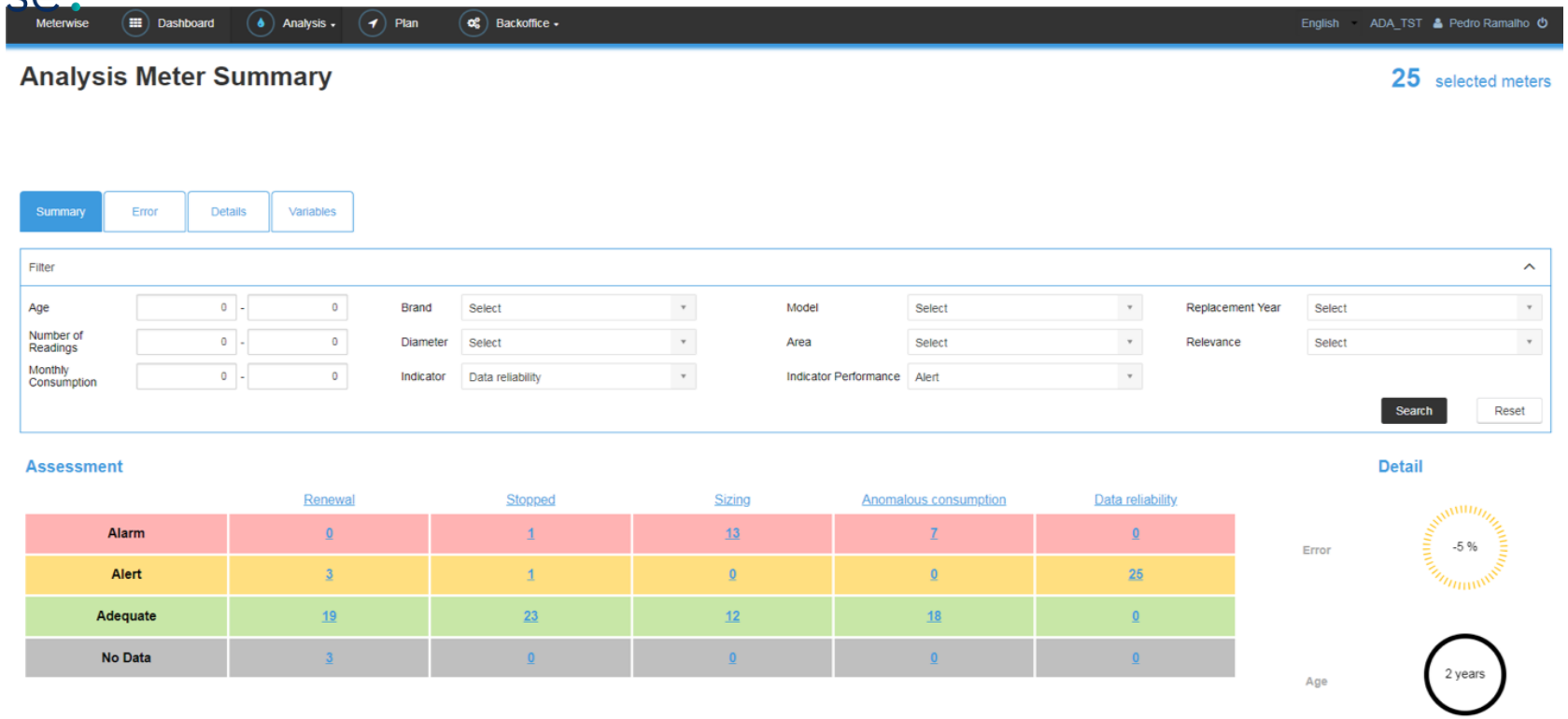


AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

meterwise.

Analysis of the most relevant aspects of meter management: renewal, stopped meters, sizing problems, anomalous consumption and reliability of records data

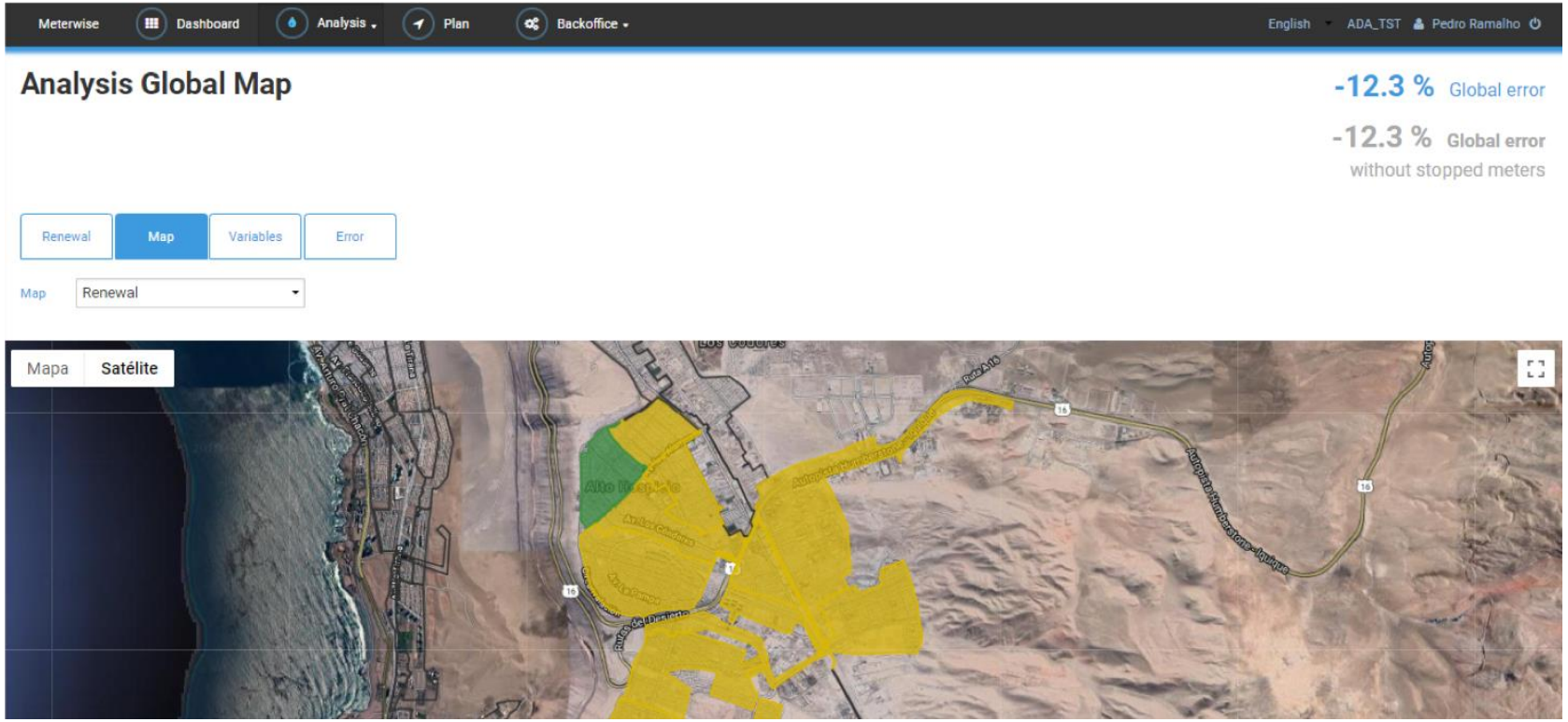


AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

meterwise.

Analysis of measuring errors by area or diameter based on the initial error and the degradation rate

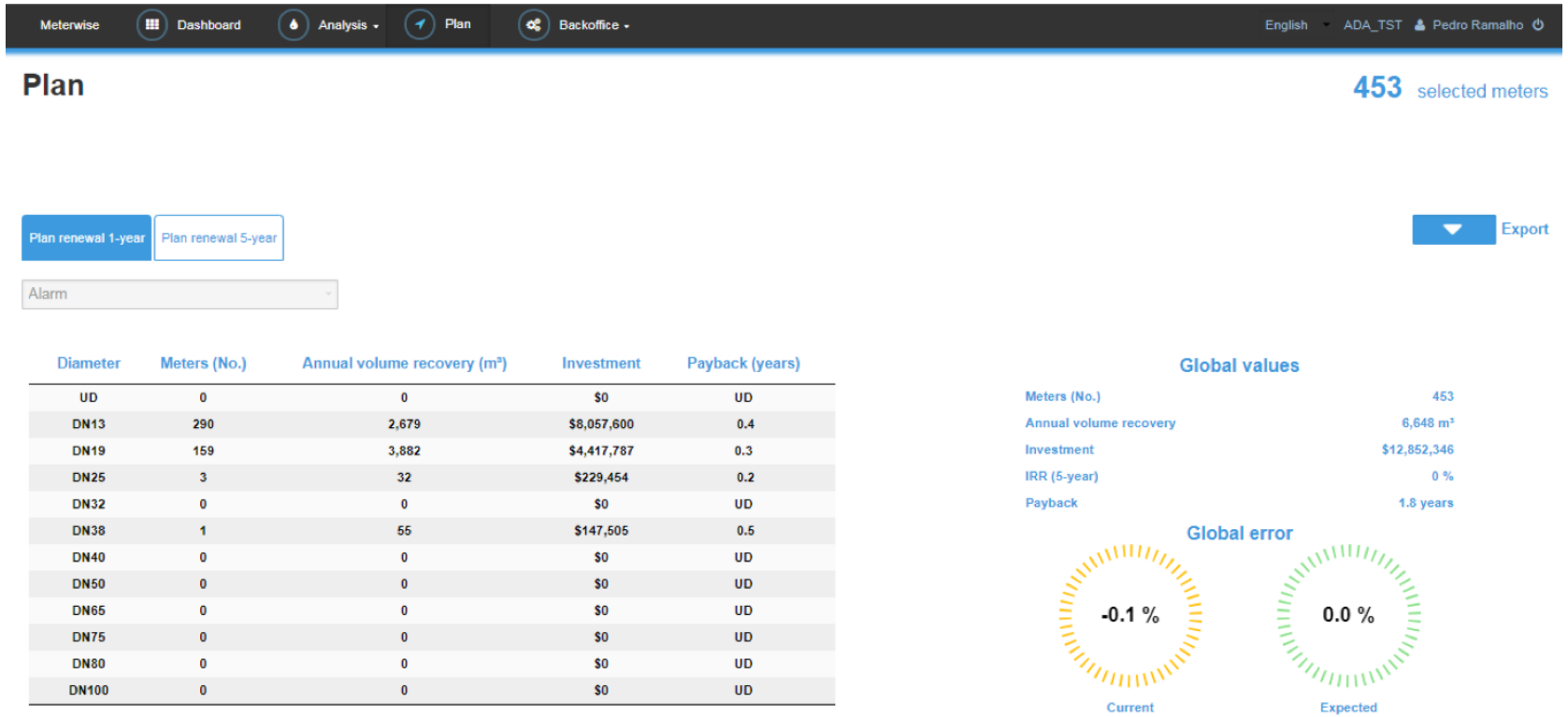


AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

meterwise.

Support for the preparation of the meter renewal plan (annual or 5-year plan)



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

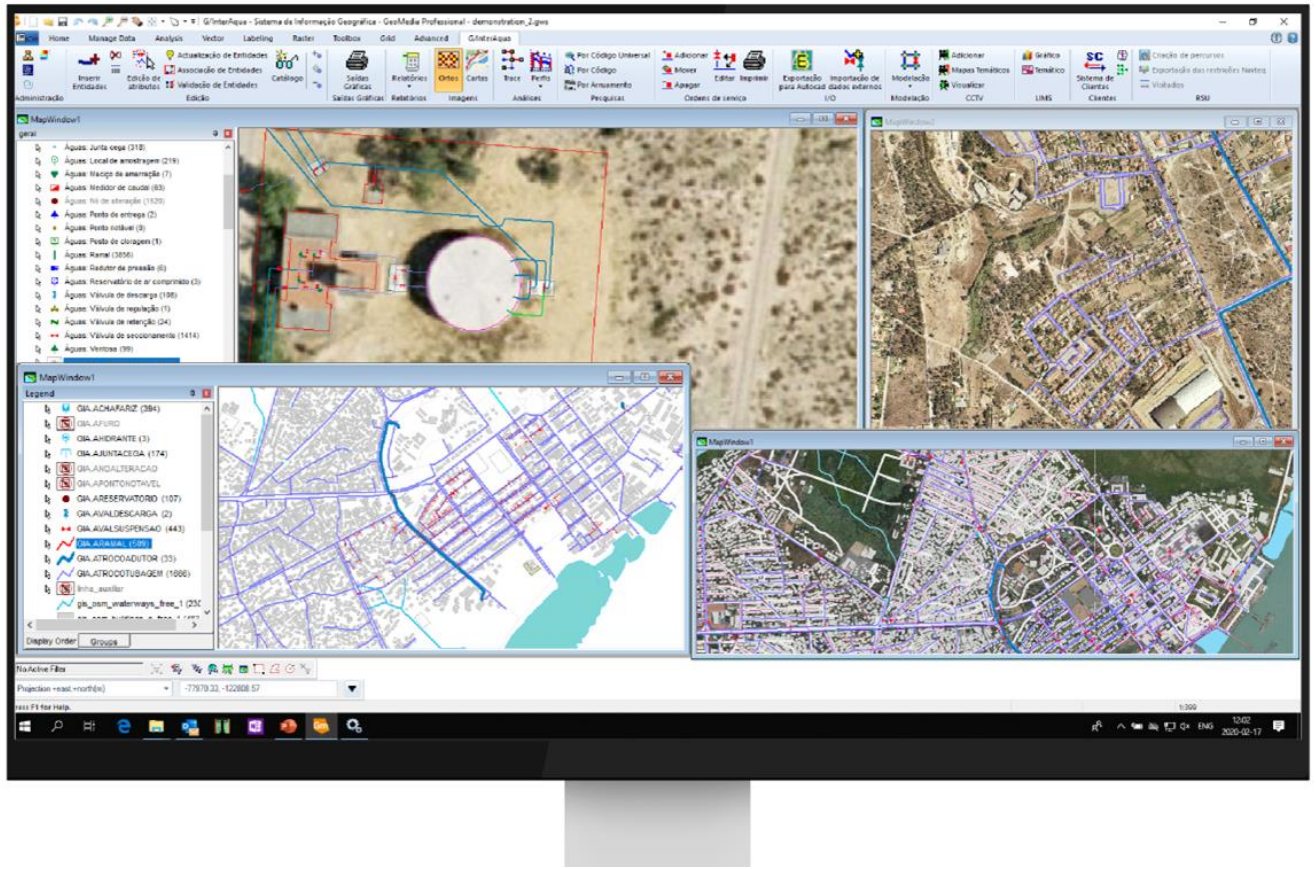
G/Interaqua.

Expansion of the spectrum of possibilities for analyzing problems that are placed on technical management, at historical, statistical and thematic processing of information

Decreased risk of dependency on human factor in the operation of networks

Support for loss and leak control programs

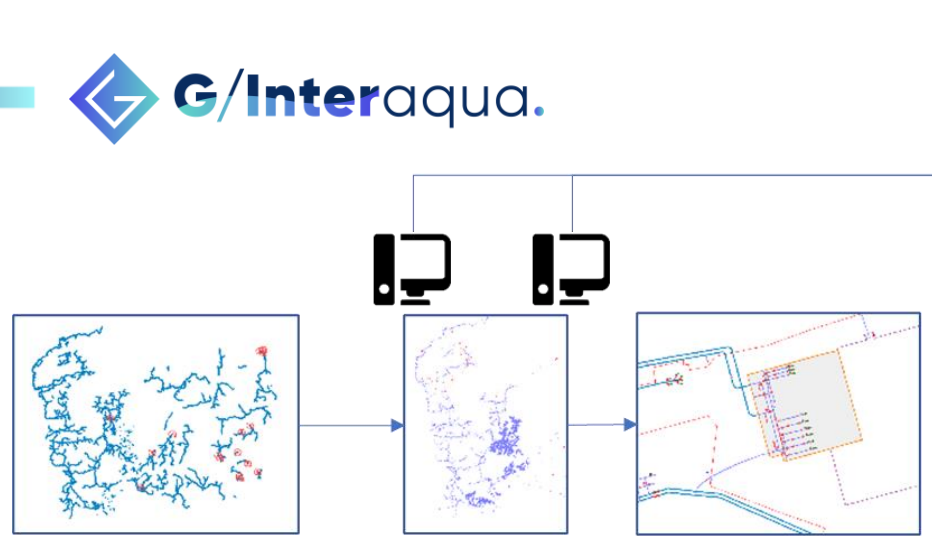
Integration with other information systems CRM, ERP, Asset management and Operation management



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

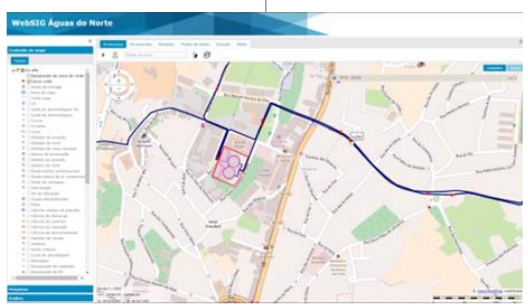
2. Software solutions

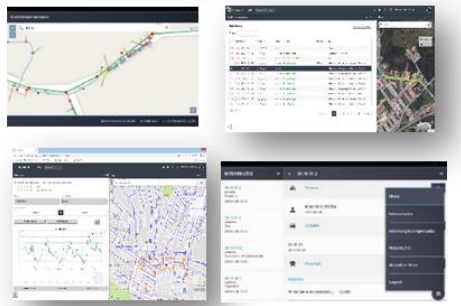
G/Interaqua.



flowise.

aquaworks.





AGS WaterSolutions AQUASIS

TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

G/Interaqua.

Modular

Solution

Adapted to users needs

Integrated Administration Desktop and Web

Spatial modeling

Associação Multimédia

Data import/export for other systems

Hydraulic network analysis / affected customers

Hydraulic Modeling

Historical

AGS WaterSolutions AQUASIS

TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

G/Interaqua.

Feature editing

Bulk atribbutes editing

Feature validation

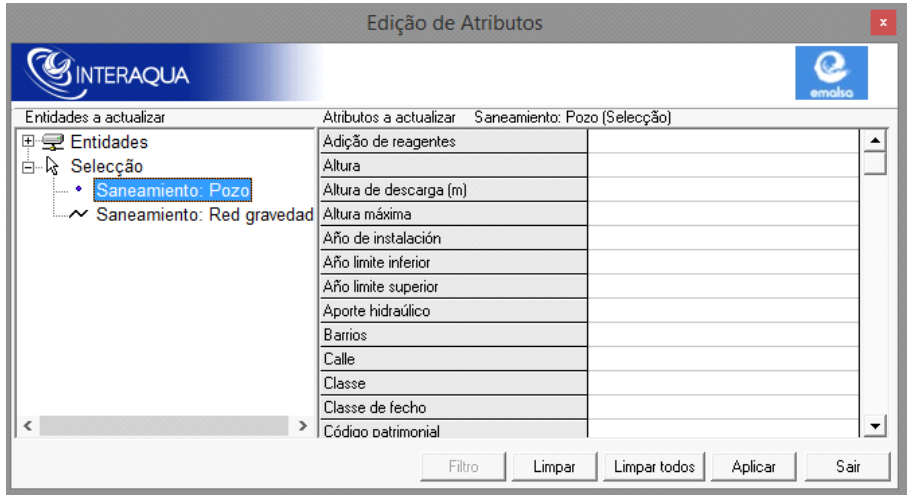
Data import/export for the model

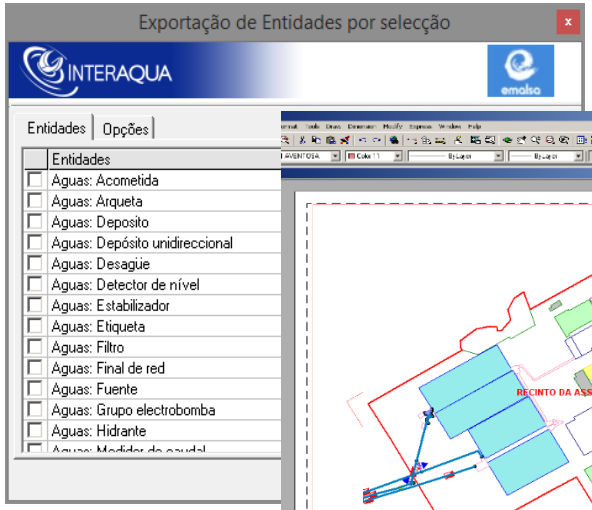
Data import/export from/to AutoCad

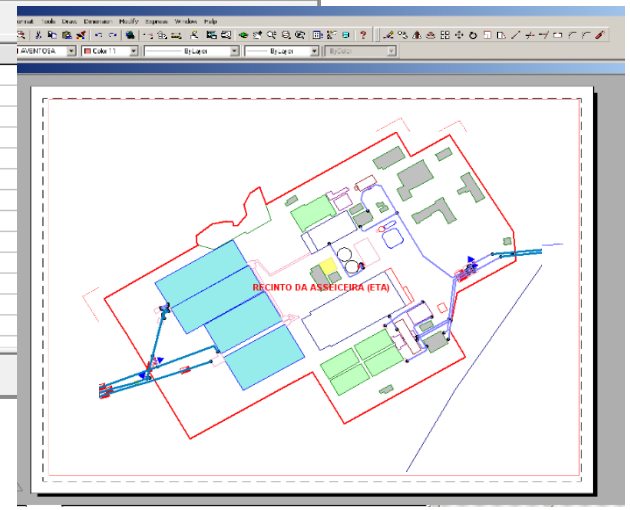
Shapefiles

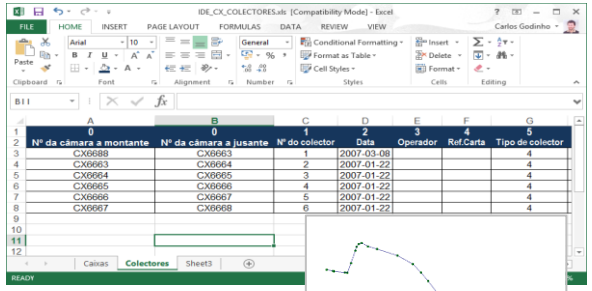
Geodatabase

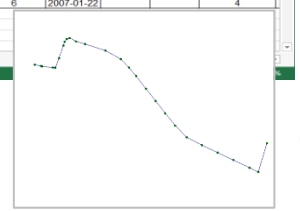
OGC compliant sources











AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

G/Interaqua.

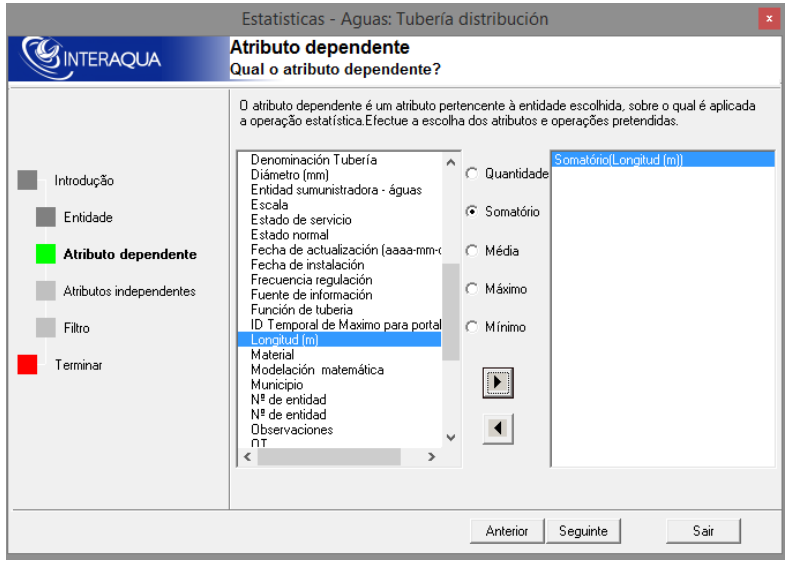
Reports on each of the features

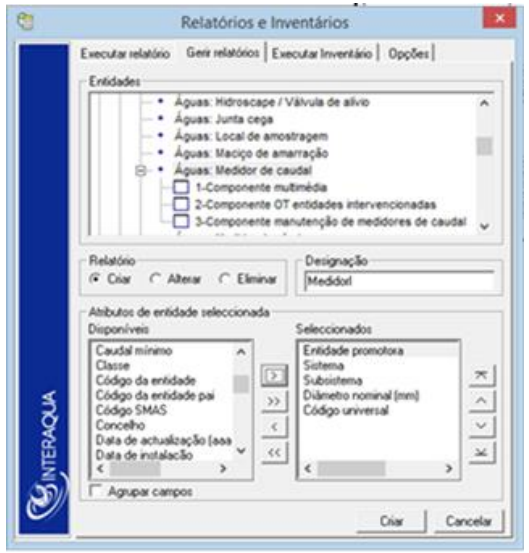
management of report types

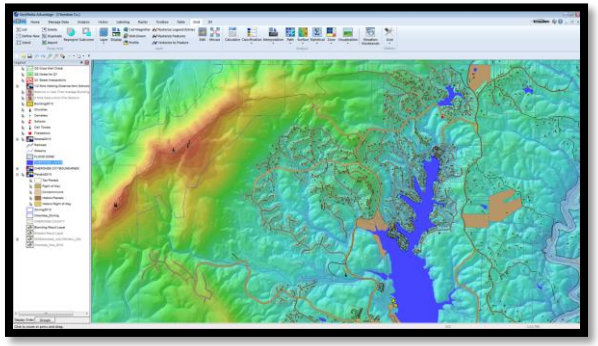
Inventory production

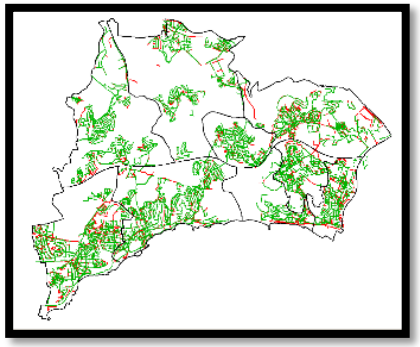
Location of results

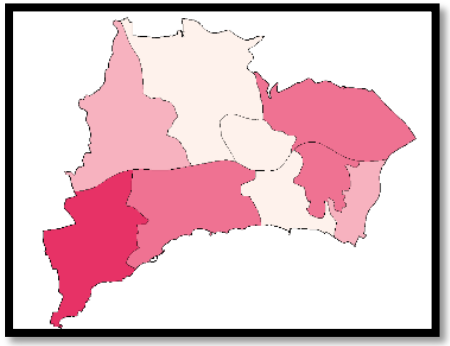
Thematic maps









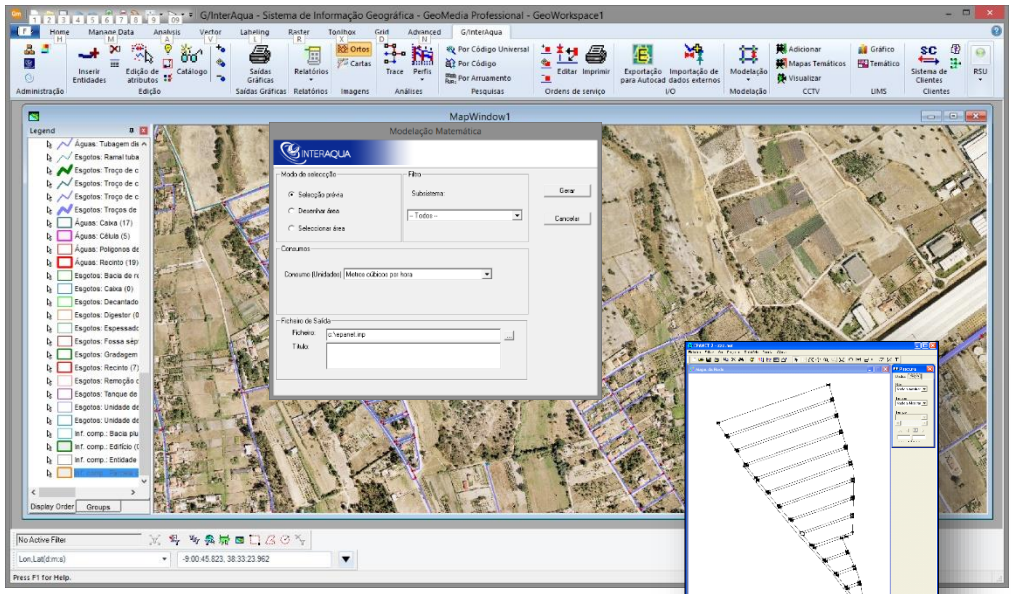


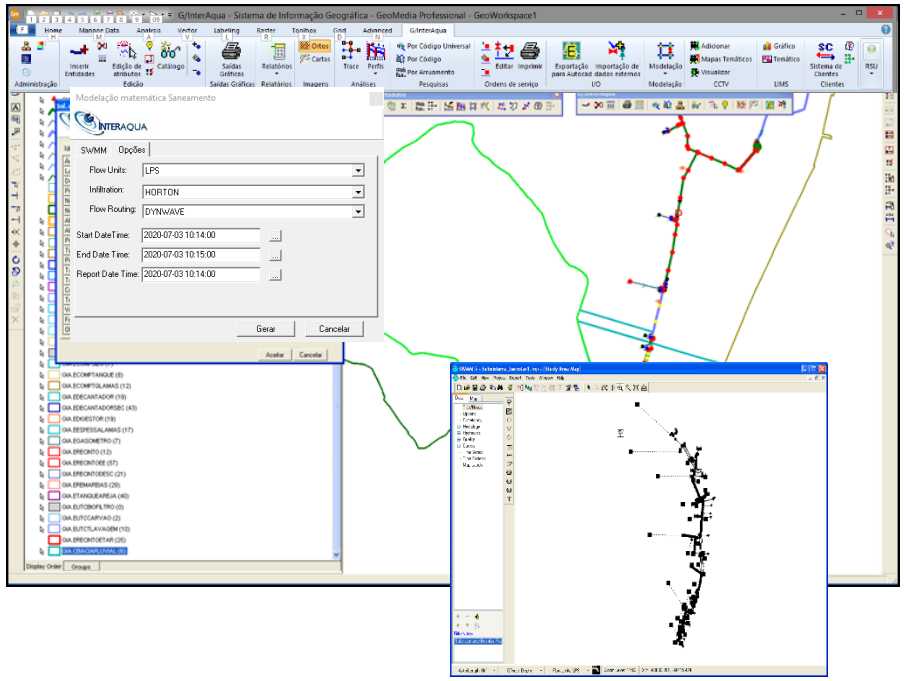
AGS WaterSolutions AQUASIS

TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

G/Interaqua.





Production of topological files for EPANET

EPANET Simulation Import

Production of topological files for SWMM

AGS WaterSolutions

AQUASIS

TADECO TECHNOLOGY

TADECO CONSULTING

2. Software solutions

Service Orders

G/Interaqua.

aquaworks.

flowise.

SO addition

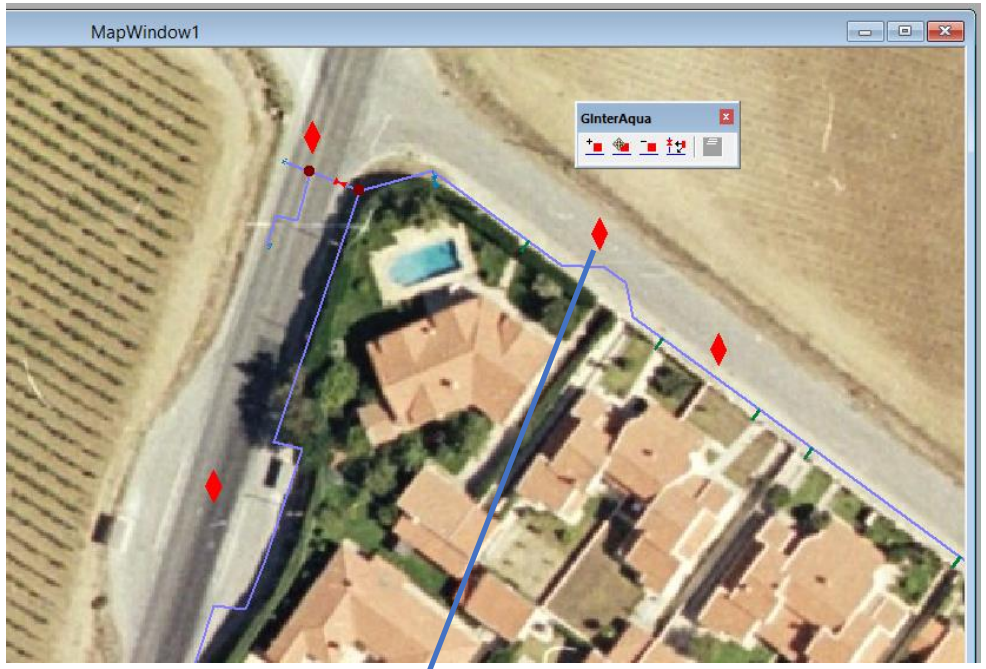
Move SO

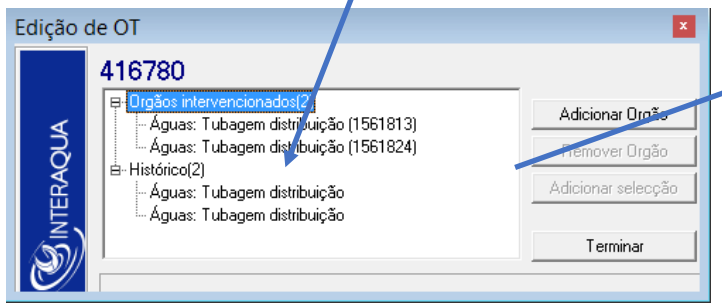
Network element associations to SO

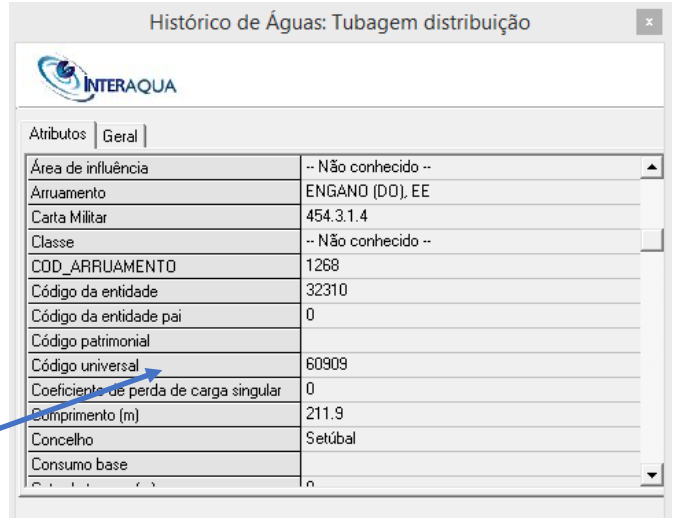
Historical data :

- geometries consultation prior to the last modification
- data query of previously modified network elements
-

Integration with AQUAWorks and Flowise







AGS WaterSolutions

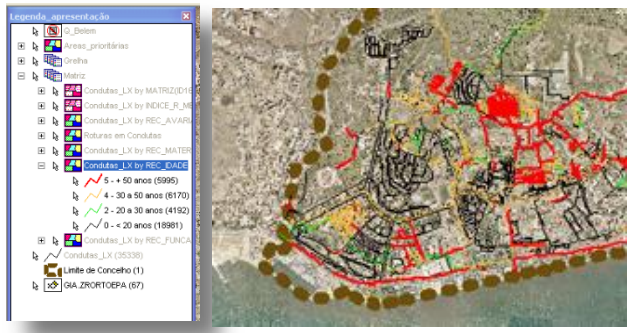
AQUASIS

TADECO TECHNOLOGY

TADECO CONSULTING

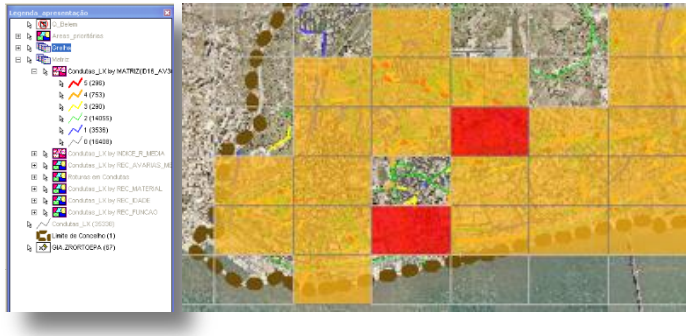
2. Software solutions

G/Interaqua.



Network age

Matrix calculation



Generation of aggregate grid of crytical sections

Analysis using multi-criteria matrix

Performance
50% - Data from G/InterAqua and AQUAWorks

Critical
10% - Data from G/InterAqua and AQUAWorks

Renewal vs repair cost
10% - data from ERP

Occurrences convergence area

Areas with renewal potential

AGS WaterSolutions AQUASIS

TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

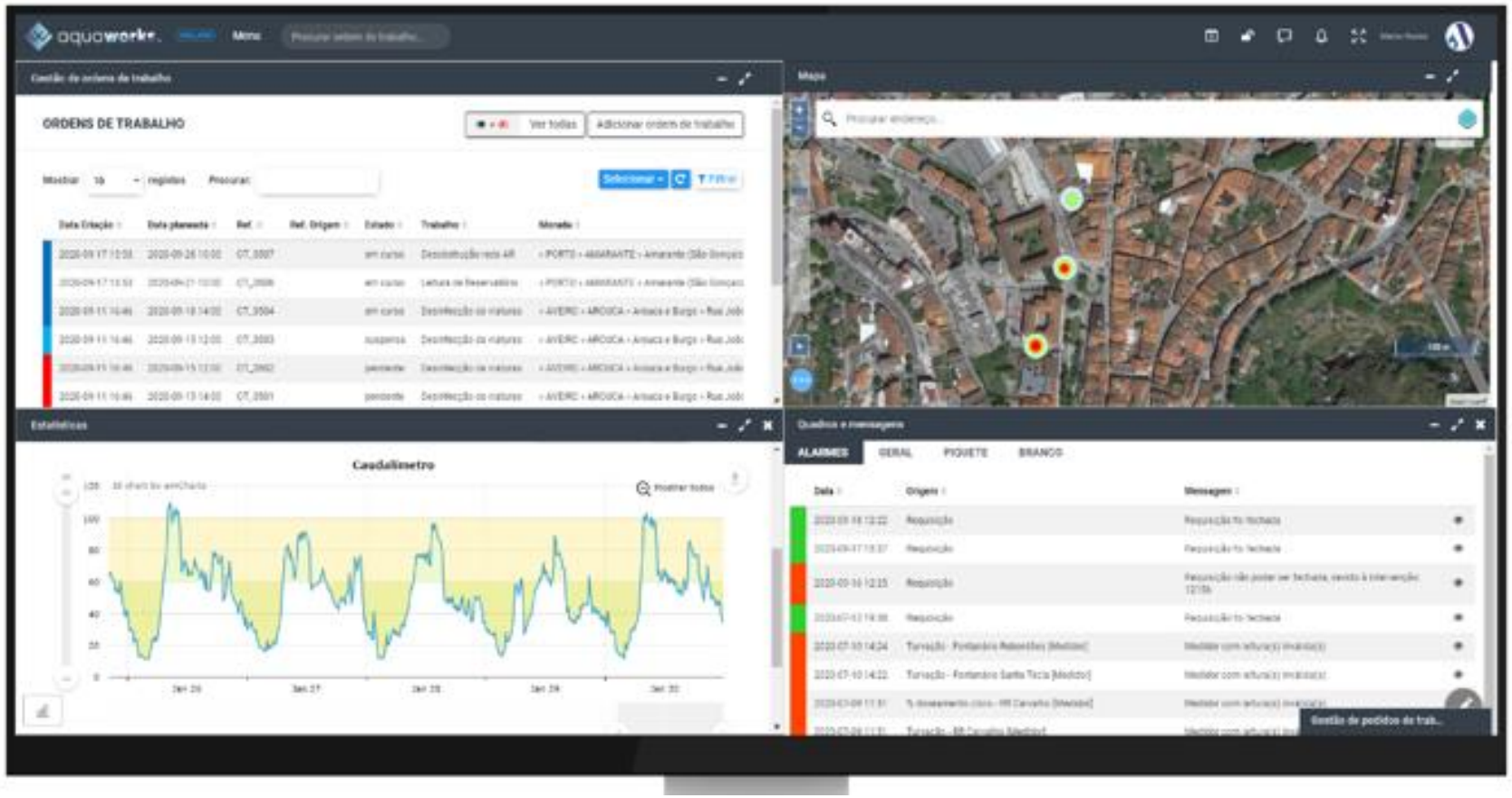
aquaworks.

It is a collaborative work platform that allows the integrated management, in real time, of all operational activity carried out by teams on the field.

Comprehensive solution to support operational management processes, allows full control of information associated with the operational activity of infrastructure networks and their integration with other IT applications (ERP, CRM, EAM, GIS).

2. Software solutions

aquaworks.



AGS WaterSolutions

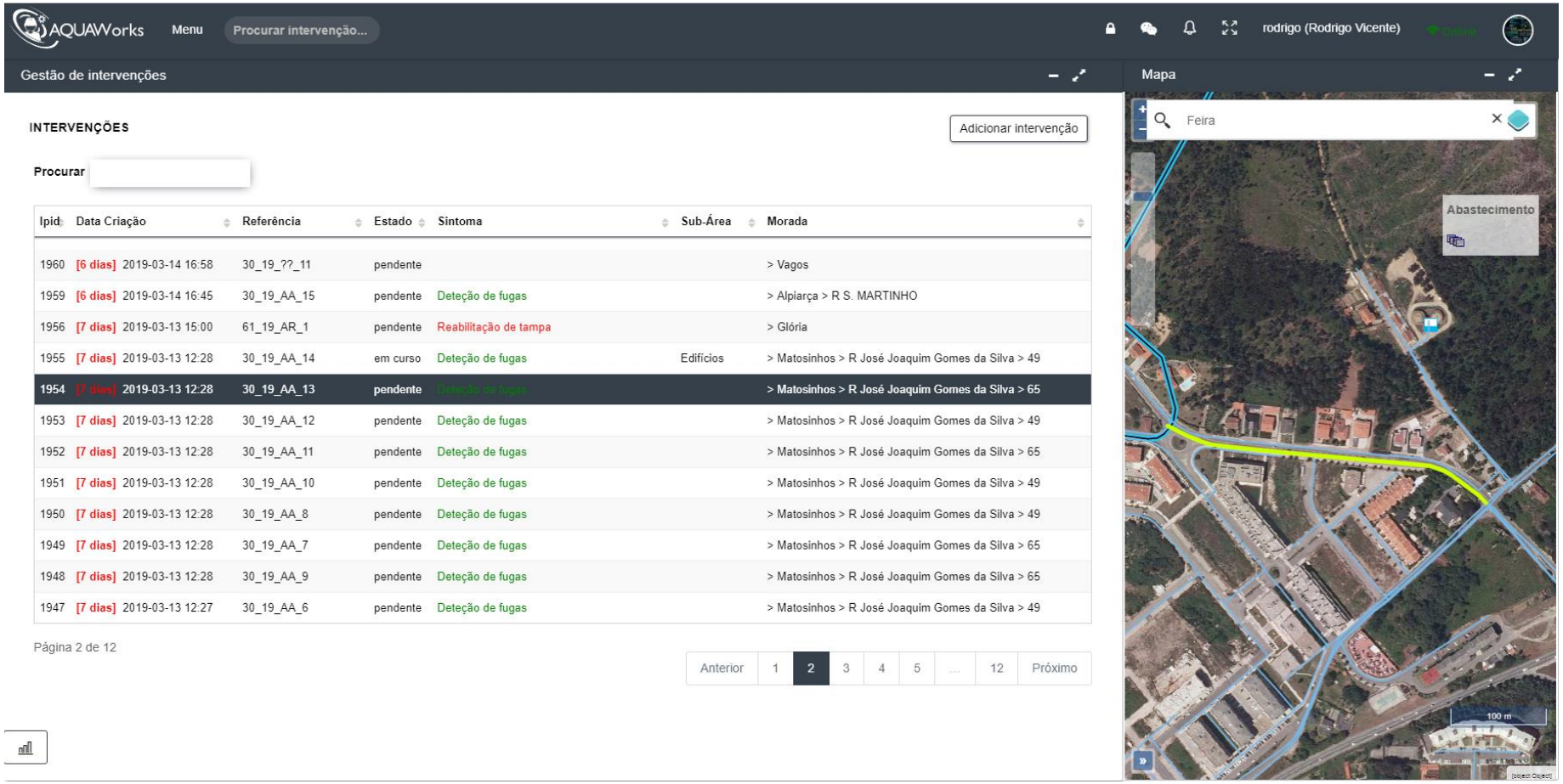
AQUASIS

TADECO TECHNOLOGY

TADECO CONSULTING

2. Software solutions

aquaworks.

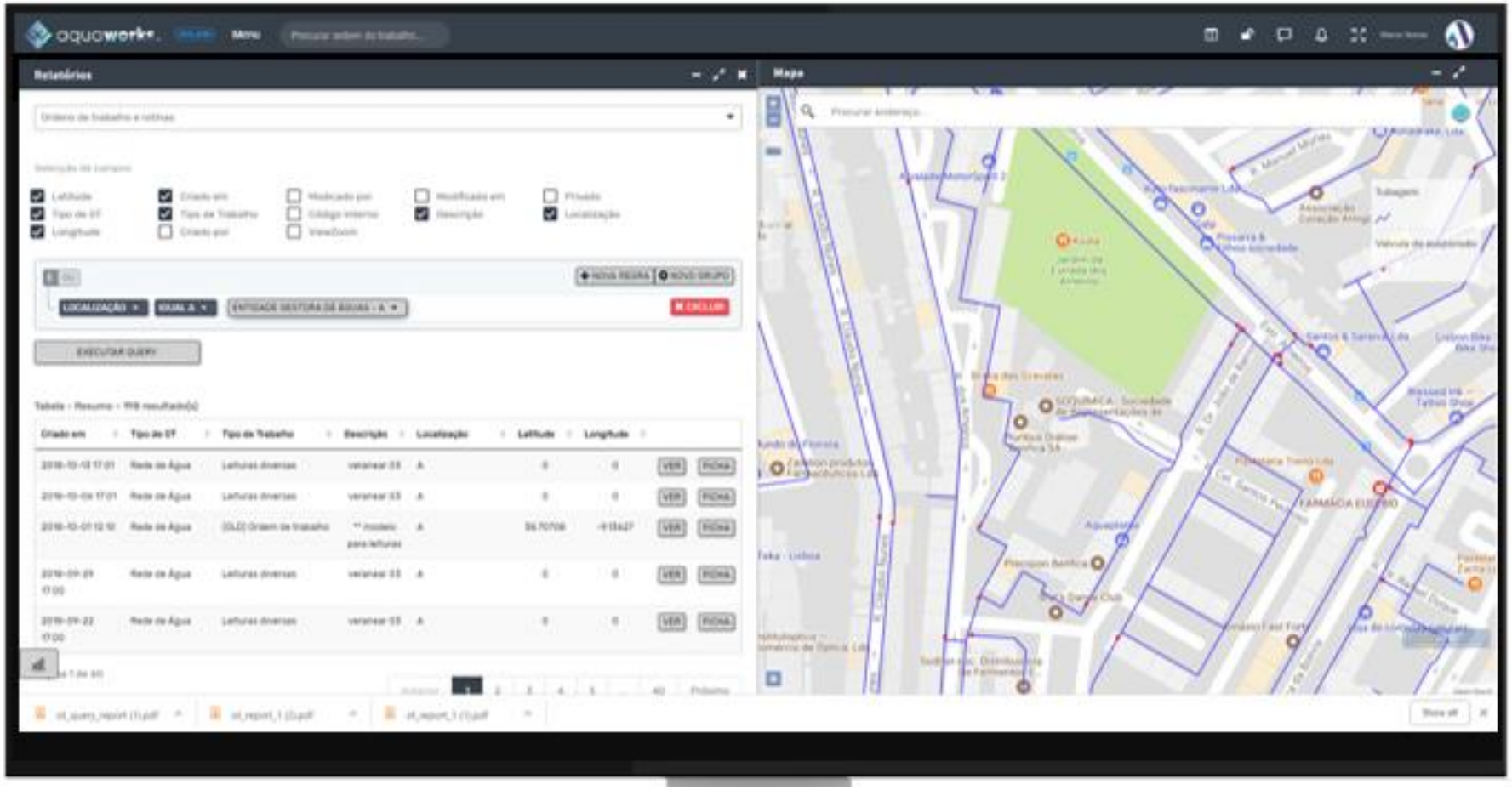


Ipid	Data Criação	Referência	Estado	Sintoma	Sub-Área	Morada
1960	[6 dias] 2019-03-14 16:58	30_19_??_11	pendente			> Vagos
1959	[6 dias] 2019-03-14 16:45	30_19_AA_15	pendente	Deteção de fugas		> Alpiarça > R S. MARTINHO
1956	[7 dias] 2019-03-13 15:00	61_19_AR_1	pendente	Reabilitação de tampa		> Glória
1955	[7 dias] 2019-03-13 12:28	30_19_AA_14	em curso	Deteção de fugas	Edifícios	> Matosinhos > R José Joaquim Gomes da Silva > 49
1954	[7 dias] 2019-03-13 12:28	30_19_AA_13	pendente	Deteção de fugas		> Matosinhos > R José Joaquim Gomes da Silva > 65
1953	[7 dias] 2019-03-13 12:28	30_19_AA_12	pendente	Deteção de fugas		> Matosinhos > R José Joaquim Gomes da Silva > 49
1952	[7 dias] 2019-03-13 12:28	30_19_AA_11	pendente	Deteção de fugas		> Matosinhos > R José Joaquim Gomes da Silva > 65
1951	[7 dias] 2019-03-13 12:28	30_19_AA_10	pendente	Deteção de fugas		> Matosinhos > R José Joaquim Gomes da Silva > 49
1950	[7 dias] 2019-03-13 12:28	30_19_AA_8	pendente	Deteção de fugas		> Matosinhos > R José Joaquim Gomes da Silva > 49
1949	[7 dias] 2019-03-13 12:28	30_19_AA_7	pendente	Deteção de fugas		> Matosinhos > R José Joaquim Gomes da Silva > 65
1948	[7 dias] 2019-03-13 12:28	30_19_AA_9	pendente	Deteção de fugas		> Matosinhos > R José Joaquim Gomes da Silva > 65
1947	[7 dias] 2019-03-13 12:27	30_19_AA_6	pendente	Deteção de fugas		> Matosinhos > R José Joaquim Gomes da Silva > 49

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

aquaworks.



AGS WaterSolutions

AQUASIS

TADECO TECHNOLOGY

TADECO CONSULTING

2. Software solutions

aquaman.

SERVICE MANAGEMENT	ASSET MANAGEMENT	INVENTORY MANAGEMENT	CONTRACT MANAGEMENT	PURCHASING MANAGEMENT
Assignment Manager	Assets	Master Articles, Warehouses	Labor Contracts	Registo de Necessidades
Labour control	Localizações	Inventory, Use	Leasing/Rental Contracts	Requisição de Compra
Qualifications	Condition Monitoring	Inventory	Payment Scheduling	Requisição de Cotação
Service Requests	Fault Codes	Condition Codes	Purchase Agreements	Pedido de Compra
Work Orders	Meters	Tools	Warranty Agreements	Receções
Specialties		Materials, Services	Terms and Conditions	Fornecedores
Service Levels				Mestre Fornecedores

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

aquaman.

Preventive Maintenance Planning

- Routes
- Task Plans
- Security Plans

Graphic Work Management

- Scheduler
- Graphic Assignement

- Performance metrics
- Key Performance Indicators Management (KPI)
- KPI Models
- Reports ad hoc
- Reports (BIRT)
- Cognos Analytics

Mobile (online)

- Service Management
- Asset Management
- Inventory Management

Anywhere (online / offline)

- Job Approval
- Failure Log
- Meter Management

- Occurrence Log
- Supervisor
- Technical
- System Manager
- Inspections

AGS WaterSolutions AQUASIS

TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

aquaman.

Manage Forms

Create and edit inspection forms

Conduct an Inspection

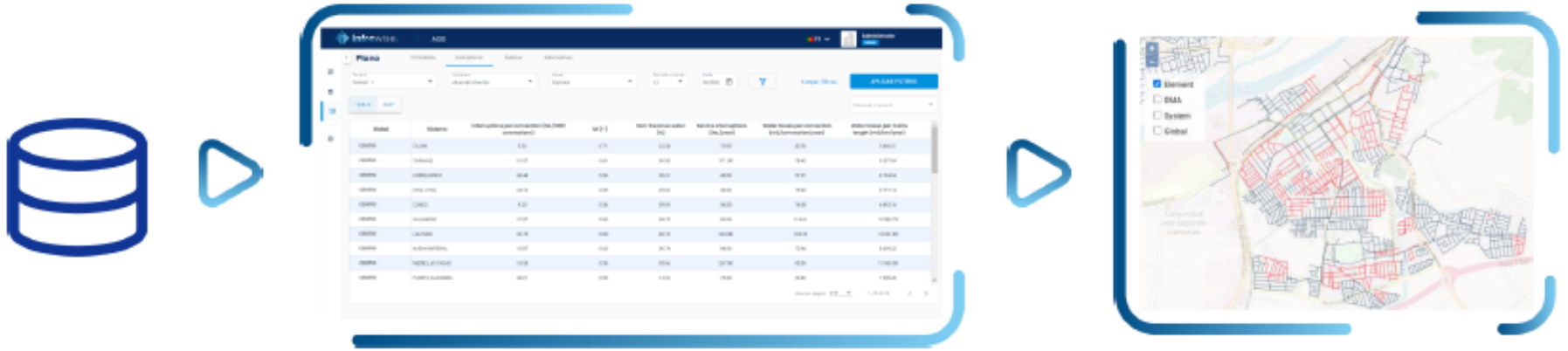
Perform, review and act on the results of an inspection.

Planned and unplanned inspections

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

infrawise.



DATA COLLECTION

Infrastructure, technical, operational, financial and other data for system analysis.

INTEGRATED ANALYSIS

Performance, cost and risk metrics calculation and evaluation.

Identification and categorization of network assets and critical areas.

INVESTMENT PROJECTION

Different investment alternatives are determined according to user criteria.

List of priority assets for rehabilitation.

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

infrawise.

Data analysis

MAP

Geographic data analysis using a map

TIME PERIODS

Select different timeframes for data analysis

CRITERIA

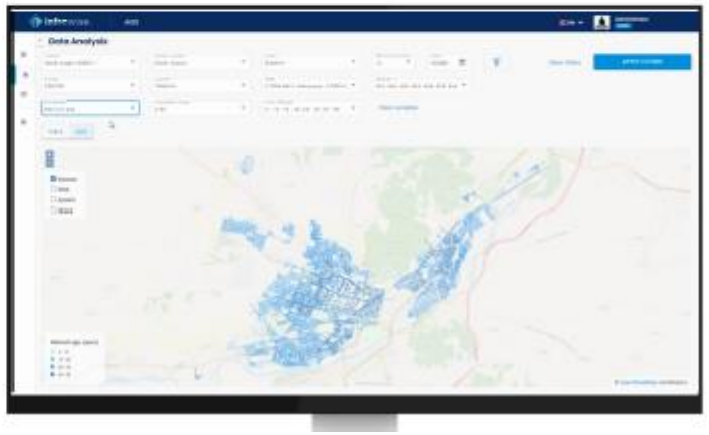
Introduce criteria for tailored visualisation of the variables in the application

DETAILED ANALYSIS

View the data for each element, area, system or globally

HISTORY

Select the reference month in order to view the data over time



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

infrawise.

Plan

CRITICALITY

Analyze the assets by criticality level according to their function

MULTI-LEVEL DISPLAY

View data at element level, area level, system level or global level

HISTORY

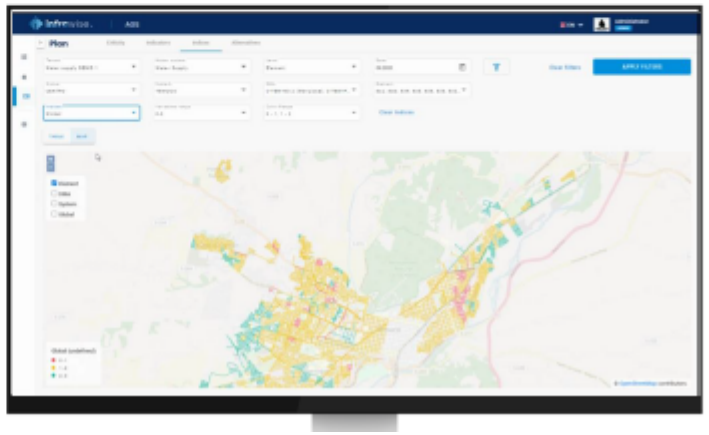
Selection of the reference month to visualize the results of the metrics and indexes over time

INDICATORS

Determine performance, cost and risk metrics via the application library or user defined

MAP

Analyze the results of the metrics geographically using a map



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

infrawise.

Plan

STANDARDISATION

Convert the selected metrics into dimensionless indices

INTERVENTION ALTERNATIVES

Analyze different renovation solutions based on different user criteria (private alternatives) or water utility criteria (public alternatives)

INVESTMENT

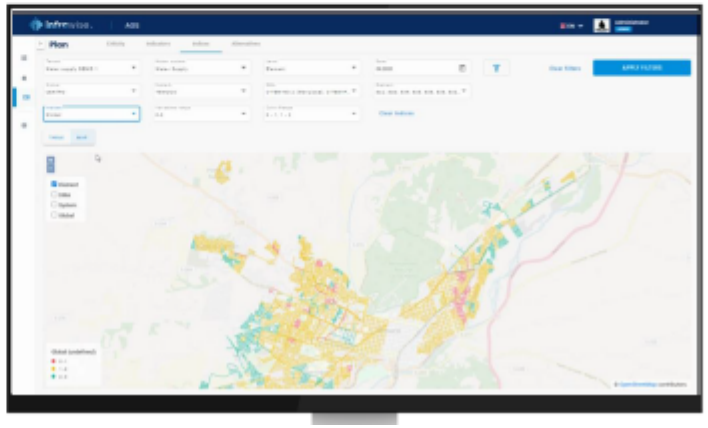
Determination of the necessary investment associated with each rehabilitation alternative

MULTI-CRITERIA ANALYSIS

Indices weighting according to user or utility criteria

PRIORITISATION

Prioritize the assets and the areas according to the weights assigned to each index



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

infrawise.

Settings

DATA

Import the baseline data for determination of the variables

LIBRARY

Check the library metrics in the application or define new metrics and/or new criteria

USERS

Manage the application users in the water utility

VARIABLES

Define the variables that support the calculation of the metrics

ANALYSIS LEVELS

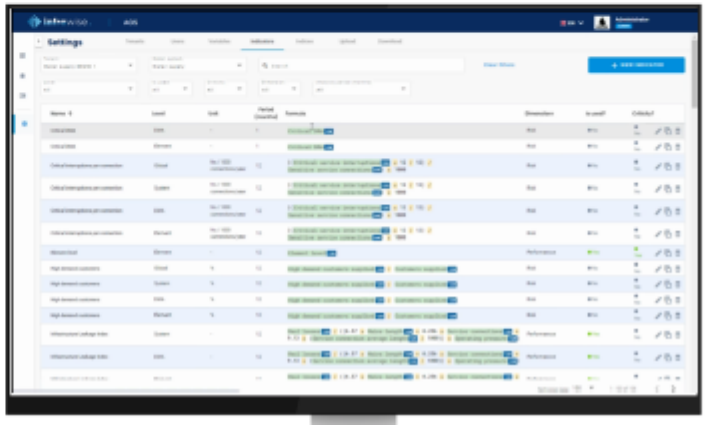
Establish the hierarchy of levels of analysis (elements, areas, systems, global level)

TEMPLATES

Download the templates from the software

METRICS

Define the performance, cost and risk metrics of the assessment system



INDICES

Define the reference values to evaluate the results

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

2. Software solutions

infrawise.

Dashboard

GLOBAL INDEX

View the water utility's global index based on the results of the software

NETWORK

Identify the length of network where performance is unsatisfactory

UNDERPERFORMING ASSETS

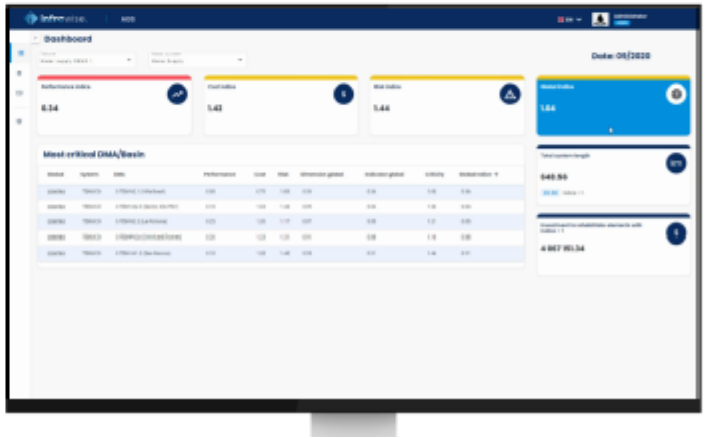
Estimate the investment required to rehabilitate assets with performance indices below 1 (unsatisfactory)

MOST CRITICAL AREAS

Visualize the most critical DMA or drainage basins

PERFORMANCE, COST AND RISK

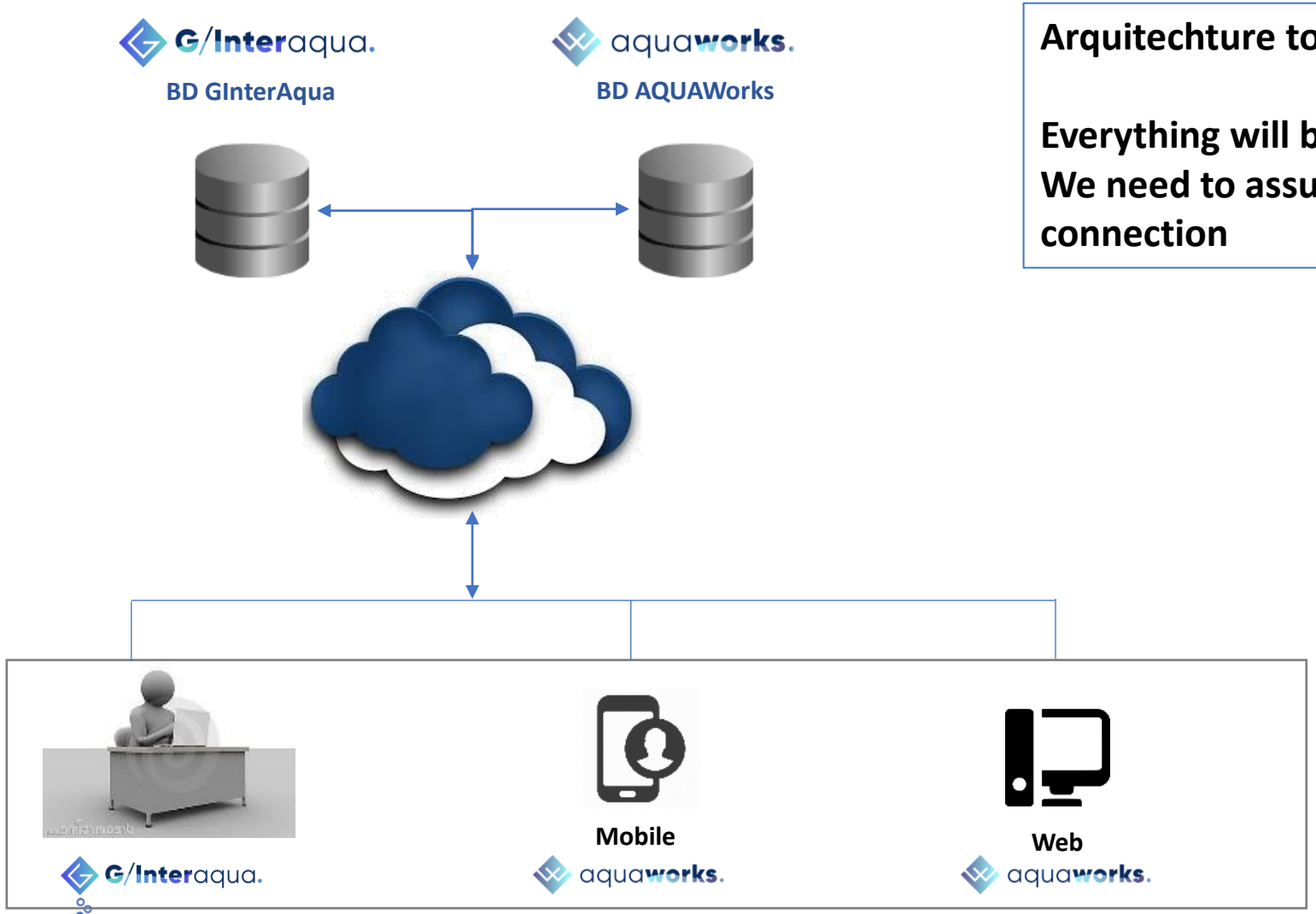
View the water utility's global index in terms of performance, risk and cost



AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

03.

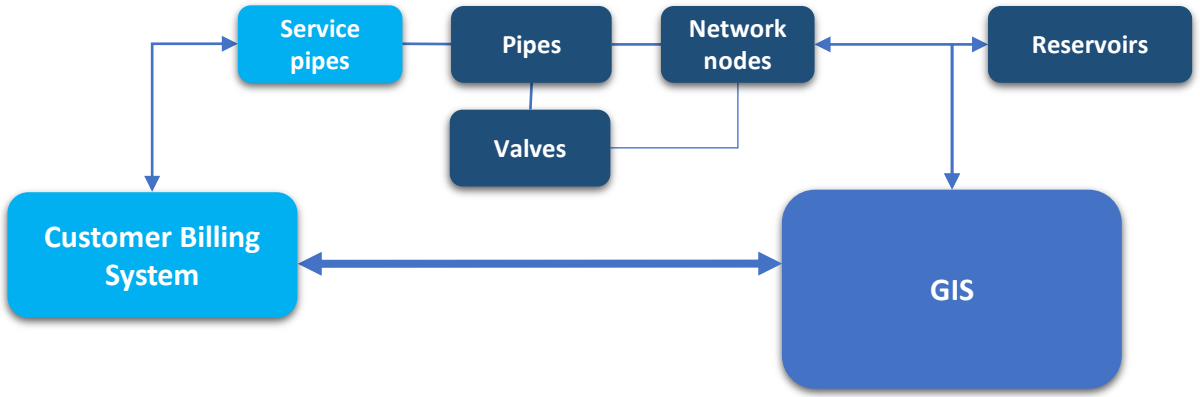
DEMO G/Interaqua and Aquaworks



Arquitechture to be used

Everything will be at AQUASIS servers.
We need to assure a very nice/strong internet connection

Relevant IT solutions and smart water networks



GIS functionalities live demo / workshop

Network data (creating, editing)
valve shutdown – topological and hydraulic network trace analysis

Data from consumer/ clientes billing system
Get demand for network nodes / reservoirs
Complete data export to EPANET

Simulation at EPANET
Simulation data back to GIS

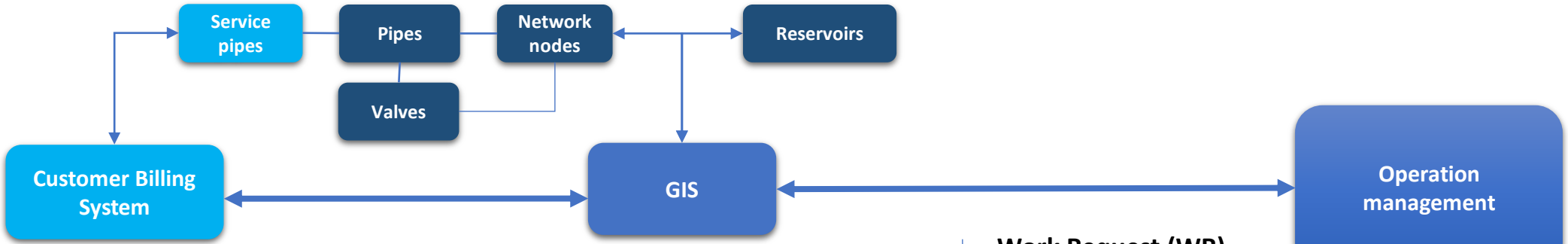
Visualizing / consulting WO data at the GIS
Network organs associated to WO

AQWKS Mobile notes for cadaster improvement

Reporting
Statistics
Inventories

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING

Relevant IT solutions and smart water networks



AQUAWorks functionalities live demo / workshop

Work Request (WR)
Work Order (WO) generation
Sending WO to Mobile

Receiving WO at Mobile
Associating WO with interviened pipes
Sending WO back to GIS
Sending notes from AQWS to GIS

Active leaks search – scheduler – WO – devolver a SIG

Reports
Heat maps
Dashboards
KPIs

Vă mulțumim pentru atenția acordată!

Carlos Godinho
Director Desenvolvimento de Negócio
Chief Business Development Officer (CBDO)

AQUASIS

AQUASIS – Sistemas de Informação, S.A.
Tel. (+351) 219 363 694
Quinta da Fonte – Ed. Q54 D. José – Piso 2
2770–203 Paço de Arcos – Portugal

www.aquasis.pt | LinkedIn

TADECO Technology

Dr. ing. Alexandru Aldea/ Director Tehnic

Phoenicia Business Center
Turturelelor 11A, Bucharest 3, 030881, Romania
Email: alexandru.aldea@tadeco.ro
Mobile: +40 732 999 029
Tel: +40 21 321 22 74; +40 37 212 28 78
Fax: +40 21 321 22 78; +40 37 212 28 79
www.tadeco.ro

AGS WaterSolutions AQUASIS TADECO TECHNOLOGY TADECO CONSULTING