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CASE STUDY FROM A REGIONAL NSW WATER UTILITY

Smart starts with the basics

Before the sensors and the dashboards, know where your pipes are.



Aqua Analytics · October 2026

Why this story suits an Integration session

Digital water initiatives stall when the asset data underneath them is wrong

It began with leak detection

Our technicians found the leaks. They also found a map that did not match the street.

The fix was data, not software

A centimetre-accurate field survey gave the utility layers it never had: valves, hydrants, meters, service lines.

Then everything connected

Billing clean-up, a hydraulic model and repeat meter reads all plugged into the one map.

Three stages, four years

Each job was scoped on what the last one revealed

01 · 2022

Detect

Active leak detection under the NSW DCCEEW regional program. 25 leaks found. The GIS problem found with them.

02 · 2025

Map

Every valve and hydrant surveyed with RTK GPS. The mains re-drawn. Shapefiles handed to the GIS provider.

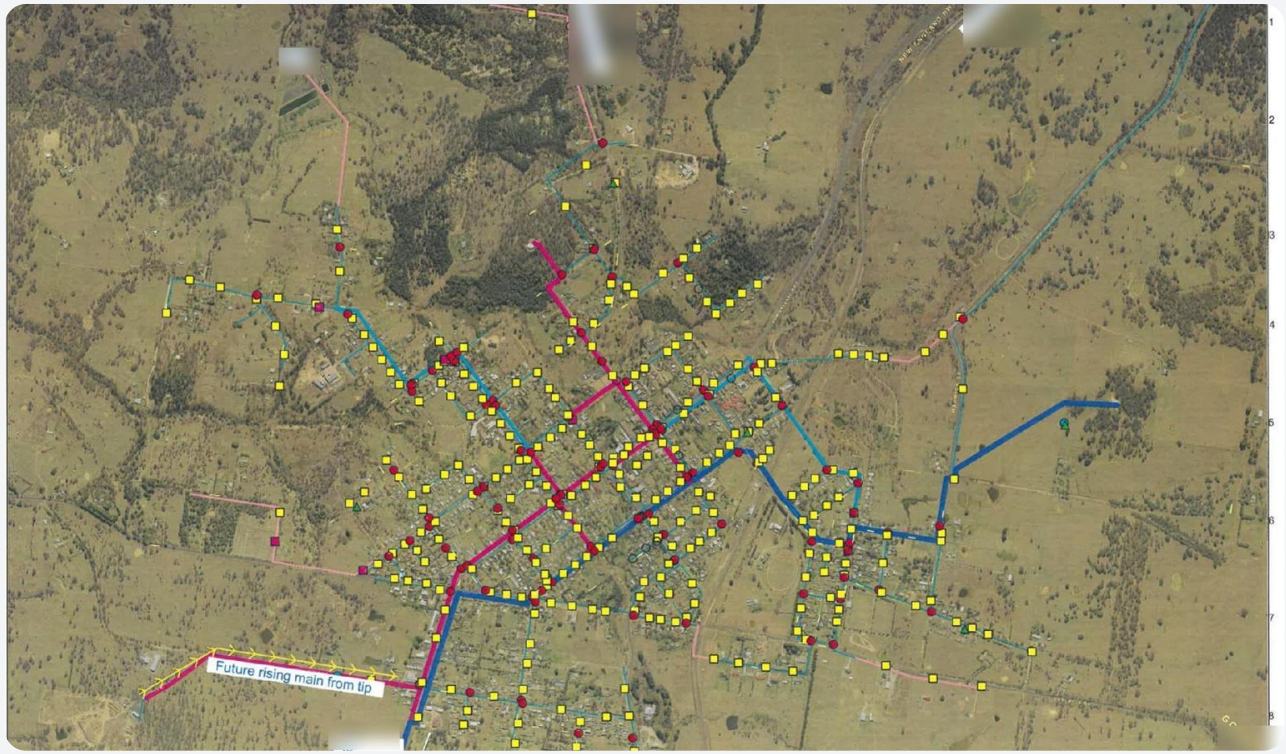
03 · 2025–26

Integrate

Every meter read and located. Billing errors surfaced. The hydraulic model finally had its inputs.

A small regional network, and a typical regional map

Two towns, about 49 km of mains, around 1,550 customer meters



The map we were handed in 2022

- Pipes not updated in years; drawn down the road, actually in the footpath
- No valve or hydrant layer. Fittings marked by eye on an aerial photo
- Meter records in a legacy MapInfo project. The person who knew them had left

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01

Detect

Data gaps became exposed under a Regional Leakage Reduction Project

Stage 1 — active leak detection, July 2022

Funded through the NSW DCCEEW Regional Network Leakage Reduction Program

49 km
of mains surveyed

25
leaks found: 19 network, 6 private

~35 ML
a year of loss identified

What we delivered

A geolocated leak register with photos and dig sheets, plus a customer-side notice for the utility to send.

What we noticed

Mains that did not run where the map said. Fittings the map did not show. A abandoned DN200 known only by marking in the valve pits.

The warning was already on file

A 2011 survey by another provider had said the same thing

43 km
surveyed in 2011

23
leaks found (mostly private side)

77
assets flagged for maintenance

That report recommended asset information updates and GPS mapping.

Fourteen years later, nothing on the map had changed. Leak detection on its own does not fix the map; it only shows you the problem.

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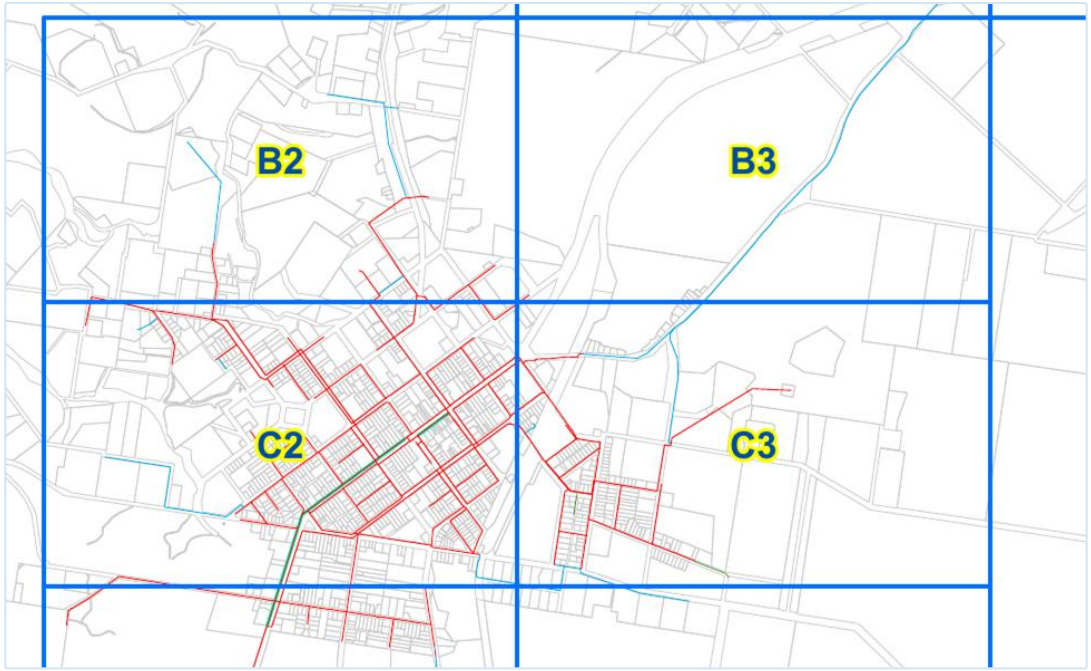
02

Map

A hydraulic model was wanted. The GIS could not support one. So we rebuilt the map from the ground up.

The network map, before and after

2022 — the GIS as supplied



Mains only. 409 fittings in a hand-placed layer, many off the pipe.

2025 — after the survey



543 surveyed nodes, each within 2.5 cm. The map now agrees with the street.

Stage 2 — four days in the field, June 2025

Two technicians, GPS receiver, every asset identified and marked - support from our GIS team

543
GPS points: 340 hydrants, 188 valves, 15 other

2.5 cm
accuracy on 99% of points

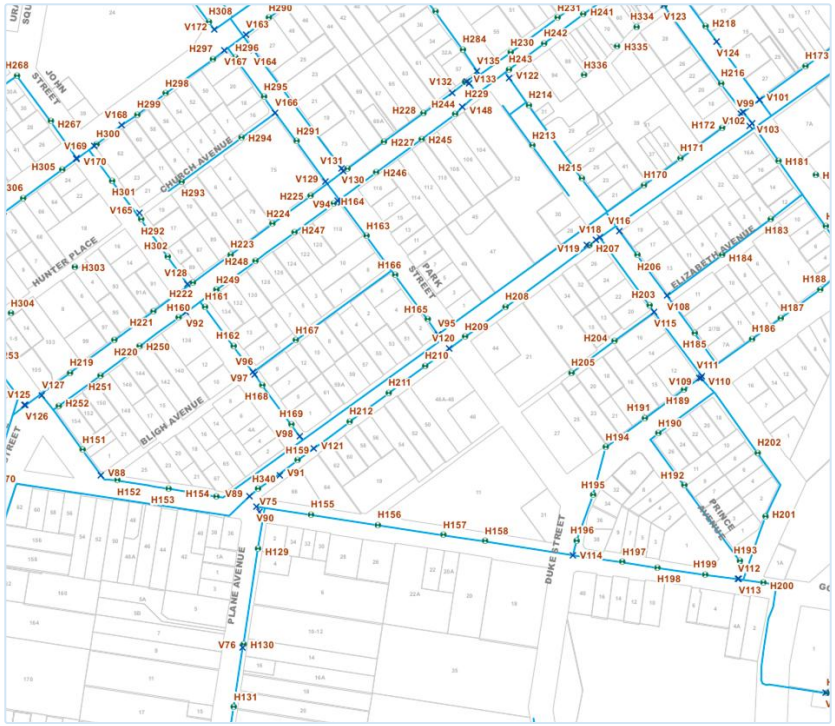
50 km
of network walked

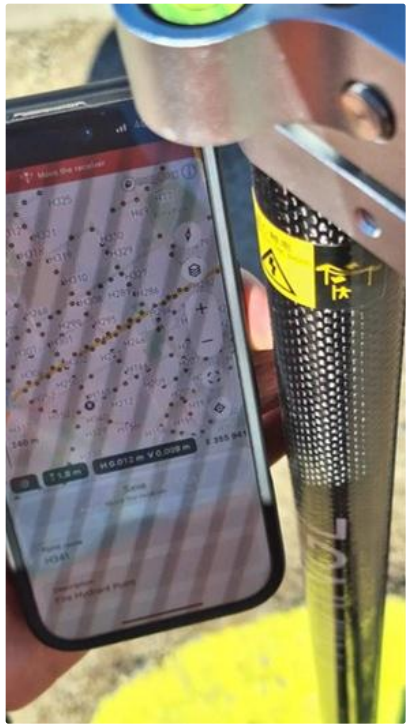
134
fittings the GIS never knew about



From survey points to a working network layer

Delivered within days, in formats the GIS provider loaded directly





- Shapefiles and CSV of all 543 assets, with a unique ID on each
- A new mains layer drawn fitting to fitting
- A ten-sheet A3 plan set the crews carry
- A plain accuracy statement: nodes surveyed, alignments estimated
- Contractor as-builts for new mains folded in afterwards

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03

Integrate

Meters, billing and the hydraulic model. What became possible once the map was right.

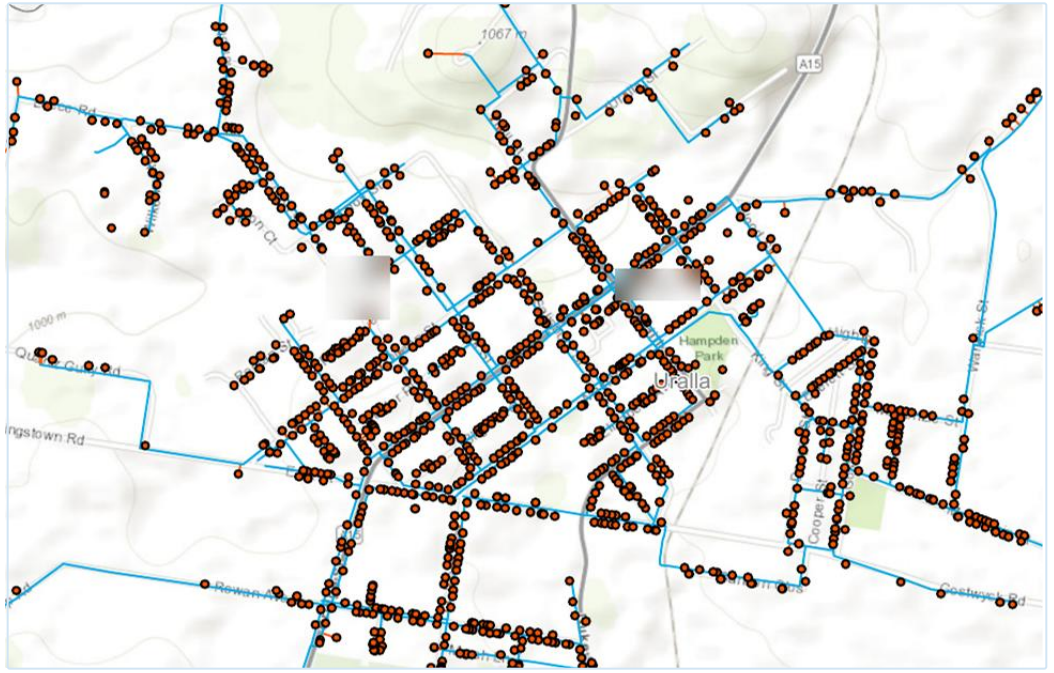
Stage 3 — the customer meters join the map

The utility could not find its own meters to read them. So we read and located every one.

1,306
readings straight into the billing platform

1,344
RTK meter points, 98% within 2.5 cm

A meter layer and an estimated service-connection layer the utility never had. Four more hydrants found on the way. The May 2026 read was faster because the crew navigated to known points.



Surveyed meter points over the re-aligned mains

What a full-network read told the billing team

Field findings reported straight back into customer records

Customers never billed

Five meters on a rural road never read. One resident of 50 years whose meter sits on the street behind.

Billing records wrong

Wrong serials, duplicate addresses, replaced meters still live, pins on the wrong street. Cleaned-up GPS entirely.

28 meters unreadable

Locked gates, dogs, buried boxes, worn serials, empty boxes. Each listed by address for follow-up.







The hydraulic model that could not be built in 2022

What the modeller asked for, and where each input now comes from

Model input	2022	2026
Nodes, pipes, hydrants, valves from GIS	Mains only; fittings off-pipe	543 surveyed nodes, mains re-aligned
Zone and valve connectivity	Closed valves known only to operators	Every valve located and identified
Customer meter locations	None	1,344 GPS points plus service lines
A year of billing data	Gaps and unlocatable meters	Three full-network reads, errors flagged
Non-revenue water rate	"Very low", unverified	Leak register and bulk meter data to test it
Pipe size and material	Partial, in legacy drawings	Being attributed onto the new layer: the open item

The foundation this utility now stands on

Five layers that did not exist, or could not be trusted, four years ago

Assets	Mains	Customers	Consumption	Losses
Every hydrant and valve to 2.5 cm, with an ID	Re-drawn between surveyed fittings	Meter points and service lines	Repeatable full-network reads	A geolocated leak register and enhanced MNF

From here the next steps are desk work, not discovery: a calibrated model, DMA design, logger placement, and one live asset and leak record shared by crews and the billing team.

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Everyone is racing to go smart. One utility could not run a hydraulic model.

Smart water is a tool. It still needs accurate data to run on. Many utilities will need to start from scratch, and that is fine. Build the map, then sectorise, then monitor.

Four lessons for utilities starting from the same place

Most regional networks are closer to this starting point than to a digital twin

1 **Let the field service find the gap**

Leak detection and meter reading already put trained people at every fitting. Scope the GIS capture in with them.

2 **Survey nodes, not pipes**

Fittings are visible and surveyable to centimetres. Buried alignment is not. Say so in the metadata.

3 **Deliver into the systems they already run**

Shapefiles to the GIS provider, reads into the billing platform. No new portal needed.

4 **Design the first survey for the second use**

Specified to a modeller's accuracy before mobilising. That is why one data set now serves billing, hydraulics and operations.

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The water network experts.

Water loss management, leak detection, network optimisation and condition assessment across Australia and New Zealand.

New South Wales

2 Portside Crescent, Maryville NSW 2293

02 9056 7123

nsw@aquaanalytics.com.au

National

1800 264 262

hello@aquaanalytics.com.au

aquaanalytics.com.au

