Scottish Water adopts new Phocus3 acoustic noise logging for effective leak location

The recent advances in the new technology of acoustic noise logging and the operational benefits it can bring have been recognised by Scottish Water, as they look carefully at how this new technology can be deployed to further reduce leakage levels.

Scottish Water, at Glasgow, decided upon the use of Phocus3 noise loggers to further reduce their leakage - aiming to employ the latest techniques which improve the effectiveness and efficiency of leak location. Phocus3 is produced by Primayer, one of the UK's top hi-tech manufacturers of data monitoring and leak location systems, who are recognised for their innovative approach to new aqua technology and design.

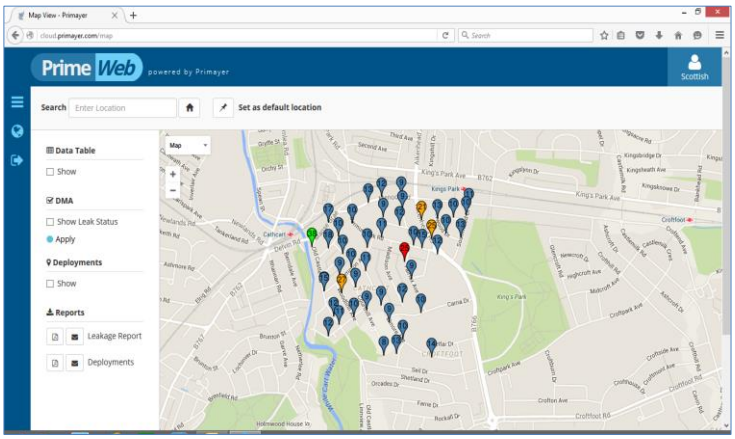
In principle, acoustic noise is recorded at one-second intervals over three hourly periods during the night, when background noise is likely to be lower. Noise amplitude (or loudness) will vary due to random effects, but there will always be a consistent minimum due to any noise that

is always present - for example leakage. Furthermore, leak noise tends to have reasonably consistent amplitude.

Scottish Water technicians in the field 'lifted and shifted' the Phocus3 and uploaded the recorded data on a daily basis to the newly developed PrimeWeb online platform. PrimeWeb was reviewed by an analyst who then pinpointed areas of interest for further investigation. These areas were followed up and confirmed with the use of the Enigma correlating noise loggers.

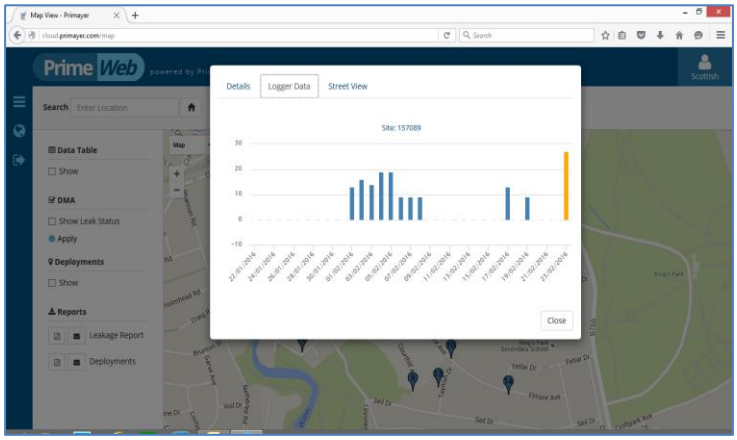
Crompton DMA – Map View

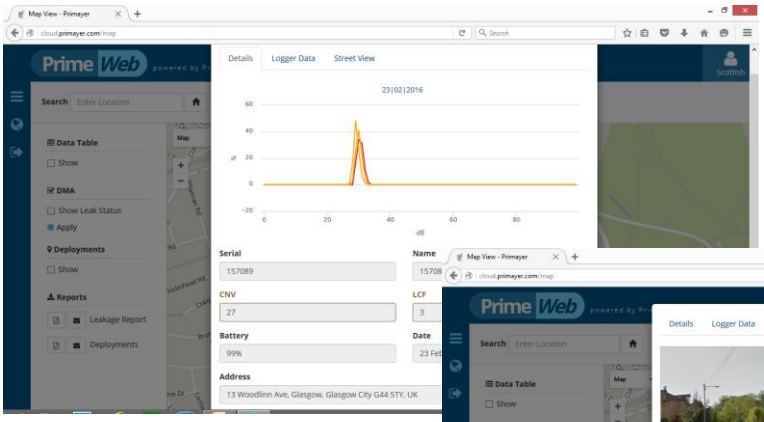
A large number of loggers were deployed on the network, with two main areas of interest highlighted. This later proved to be two leaks, one on a 4" cast iron main, which was proved and confirmed by Enigma, seen below and the second leak was a passing hydrant highlighted LCF4 on Fairfax Avenue.



Crompton DMA – Logger Data View

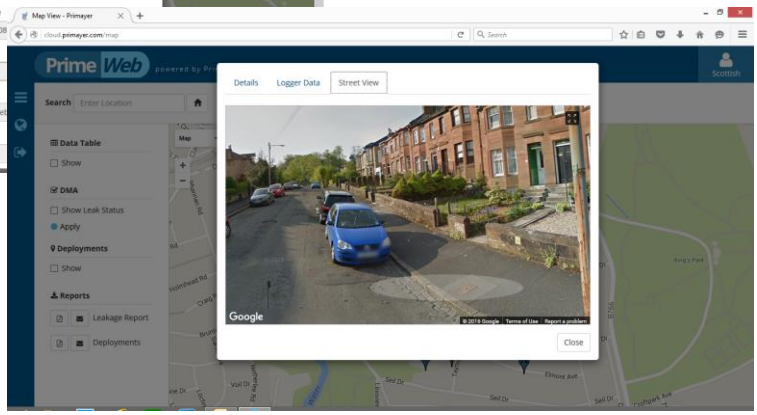
From the initial results closer investigation proves one of the areas of interest, showed a good leakage confidence factor – level 3, and critical noise value of 27.





Logger Histogram

On further interrogation of this individual logger, results indicated the potential leak.

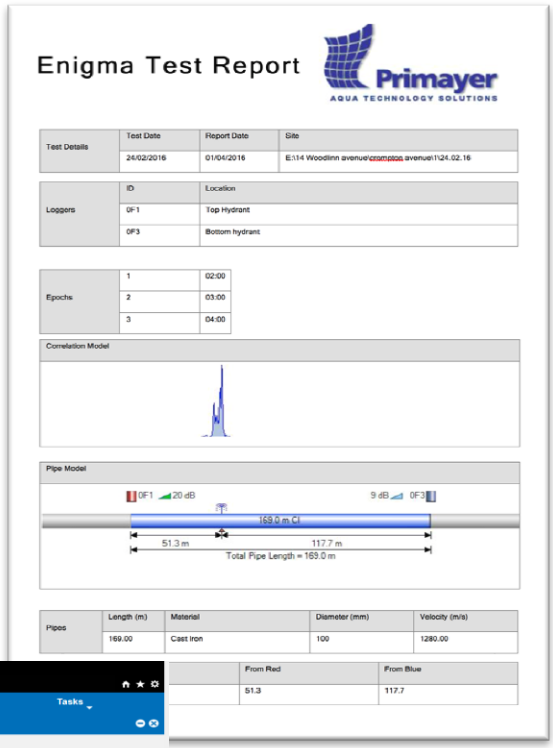


Street View

Within the PrimeWeb software, the exact GPS location of the logger deployment can be seen clearly on Google Street View, minimising the risk for error.

Enigma Test Report

The technician followed up the results indicated by Phocus3, the same day using the Enigma correlating noise loggers to pinpoint the location of the leak. The test report below shows the leak was pinpointed over 169m of 4" cast iron main, on Woodlin Avenue, 117m from a corresponding logger.


Enigma Test Report

Primayer
AQUA TECHNOLOGY SOLUTIONS

Test Details	Test Date	Report Date	Site
	24/02/2016	01/04/2016	E:\14 Woodlinn avenue\crompton avenue\1\24.02.16

Loggers	ID	Location
	0F1	Top Hydrant
	0F3	Bottom hydrant

Epochs		
	1	02:00
	2	03:00
	3	04:00

Correlation Model

Pipe Model

0F1 20 dB 9 dB 0F3
169.0 m CI
51.3 m 117.7 m
Total Pipe Length = 169.0 m

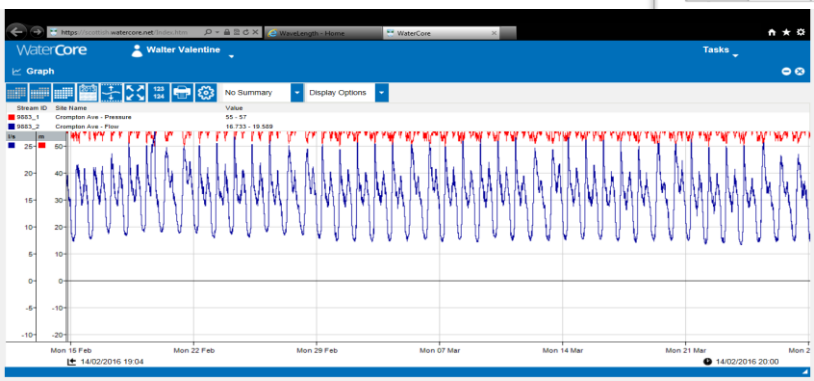
Pipes	Length (m)	Material	Diameter (mm)	Velocity (m/s)
	169.00	Cast Iron	100	1280.00

	From Red	From Blue
	51.3	117.7

Results

Information received from Scottish Water show the overnight deployment highlighted two leaks, these two leaks equate to around 0.5 litres per second saving, and you can see the rise and the gradual reduction in flows within the DMA. There were two leaks repaired and a hydrant shut down on site as part of the investigations into the sweep.

Scottish Water continued to use this lift and shift methodology of localising the leak using Phocus3 and confirming the leak using Enigma.



Primayer Limited
Primayer House, Parklands Business Park
Denmead, Hampshire PO7 6XP, United Kingdom
T +44 (0)2392 252228 **F** +44 (0)2392 252235
E sales@primayer.com
www.primayer.com