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Buffalo Grove, Illinois Avoids Costly Leak Through 24/7 Water System Monitoring

OVERVIEW

The Village of Buffalo Grove, located in the northwest suburbs of Chicago, partnered with Aquify to provide continuous monitoring and data analytics of their 189-mile drinking water distribution system. The Village wanted to manage their non-revenue water (NRW) to maintain compliance with the state's water loss regulation, avoid unnecessary loss of their purchased, treated drinking water and limit revenue loss.

In December 2019, 10 flow and pressure sensors were strategically positioned across the network to create the boundaries of four defined zones, also known as District Metered Areas or DMAs. DMAs are a proven methodology for water loss control used around the world. The data from the sensors is processed through a cloud-based machine learning (ML) and artificial intelligence (AI) platform, and gives Aquify's professionally-staffed, 24-hour control center the ability to provide the Village with insight into network behaviors, operational response and system losses.

Supervisory Control and Data Acquisition (SCADA) data from pump stations, reservoirs and storage tanks is also ingested into the platform to provide additional measuring points and a higher resolution dataset. Measurement of flow and pressure data in a DMA zone helps utilities identify when slow, trending leaks occur and helps prevent larger, disruptive main breaks from happening.

CHALLENGE

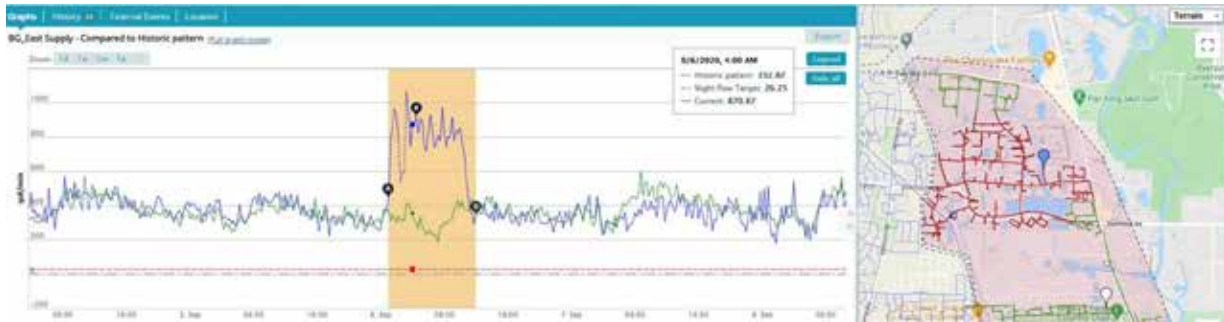
At midnight on Sunday, Sept. 6, 2020, the Aquify operations center began receiving flow alerts from the sensors installed in the zone on the east side of the village. The alerts were reporting excessive and increasing flows into the zone, which were uncharacteristic for the time of day based on the predicted flow data generated by Aquify's ML platform.



An Aquify flow and pressure sensor on a Buffalo Grove water main.

SOLUTION

After receiving the alerts and checking the sensor patterns, the Aquify team quickly analyzed data being processed through the software and determined that this significant system event was indicative of a break. By analyzing the signals from the sensors and pump stations, the Aquify team was able to locate the leak down to a specific area within the zone. With the leak identified and located, Aquify contacted the Village's water manager Ben Kruse and provided him with a situational assessment and search area to focus their leak detection efforts.



(left) When current flow data (blue line) deviated from the predicted flow (green line) the Aquify staff suspected a significant leak event. (right) Aquify's map identified the area of the leak (red lines) so the Village knew where to focus their leak detection efforts.

The Village located the break on a long fire hydrant lateral running into the rear of an unoccupied building located in an industrial park. Making detection even more challenging was the fact that the area was surrounded by ponds and it had been raining for many days. However, because they had the notification from Aquify, the Village was on alert looking for a leak. Muddy water was observed running into one of the ponds leading the operations crews to the location of the break. It was confirmed later in the day that there was a hole in the pipe.

RESULT

At its peak, the flow rate of the leak was approximately 640 gallons per minute (gpm). Since it was caught early over the Labor Day holiday weekend, the leak lasted for only 12 hours before the repair was complete, resulting in an estimated 349,000 gallons of water lost at a value of \$550 based on the wholesale cost of water. If the leak had continued to run undetected, it would have cost the Village \$1,100 per day and \$420,000 over the course of a year. Due to rapid detection and efficient response protocols, the Village of Buffalo Grove and Aquify were able to significantly reduce the run time of this leak and spare the utility the unnecessary loss of clean, treated drinking water, loss of revenue and potential collateral damage claims.

“ Water could be leaking under a creek, directly into a storm sewer, or hiding elsewhere underground and never surfacing. This 640 gpm leak was a good example of a break that would have gone unnoticed behind an empty building without our Aquify monitoring in place. ”

– Mike Skibbe, Director of Public Works, Buffalo Grove