

Real-time THM Data Helps Athens Water Supply & Sewerage Company Effectively Mitigate Harmful THMs Across Service Area



The Athens Water Supply & Sewerage Company S.A. (EYDAP) is the largest company supporting the water supply and sewerage sectors in Greece, covering the needs of more than 40% of the country's population by supplying the Attica region with drinking water, the quality of which is among the best in Europe.

Until now, EYDAP's water quality control department has relied on manual samples and laboratory measurements for trihalomethane (THM) analysis. EYDAP recently undertook an evaluation of an online THM analytical solution — the THM-100™ manufactured by Aqua Metrology Systems (AMS) — to take pressure off its laboratory and obtain same-day results on THM values in their network.

The online THM-100™ analyzer was connected to the drinking water reservoir outlet of the Galatsi Water Treatment Plant (WTP) in Athens for a three-month period, providing EYDAP with continuous online analysis of THM values. During the demonstration, AMS used the onboard health monitoring system to measure the THM-100™ analyzer performance 24/7/365. The continuous real time remote monitoring of the analyzer's performance allowed AMS to mitigate EYDAP concerns about working with a technology provider located 6,788 miles away and with a 10-hour time difference.

The real-time THM data helped EYDAP to understand how the total THM (TTHM) concentration and THM speciation composition are affected by changes in raw source water quality and chlorine contact time. With the help of the reliable data provided by the THM-100™, EYDAP could better mitigate the presence of harmful THMs across the service area.

Source Water Quality

The Galatsi WTP receives a continuous supply of source water from two raw water sources, the Mornos and Marathon reservoirs. Each reservoir has a unique water quality profile, thus, water quality at the WTP inlet is directly affected by the percentage of each source in its supply. Raw water conductivity provides an aggregate water quality parameter that is indicative of the two-source combination percentage at the WTP inlet. Raw water conductivity varies between ≈ 300 uS/cm, when only water from the Mornos reservoir is supplied, and >400 uS/cm, when only water from the Marathon reservoir is supplied.

The THM-100™ online measurements revealed how the TTHM concentration of treated water increased proportionally to raw water conductivity; hence, Marathon raw water percentage at the WTP inlet. Because the THM-100™ analyzer can measure all THM species, chloroform or bromoform as well as TTHM and THM Formation Potential (THM-FP), the online measurements showed that TTHM levels increased with a greater reliance on water from the Marathon reservoir due to elevated bromide concentrations in the source water supply.

Chlorine Contact Time

The THM-100™ analyzer provides automated measurement of THM levels with an average sample time of less than 120 minutes. The analyzer comes standard with sampling every four hours and can be adjusted to more, or less frequent intervals. In addition to the online samples, manually collected grab samples from other locations in a network can be collected and analyzed with the THM-100™ alongside samples taken automatically by the monitor in its online mode.

Because of this feature, EYDAP was able to determine the TTHM concentration in several samples collected from remote network points. The data provided insights regarding the increase of TTHM concentrations within the network as compared to the initial TTHM levels at the Galatsi WTP. For example, increasing the distance and, hence, the chlorine contact time between WTP and network sample point, the TTHM values increased accordingly. In all cases, TTHM values, even at the most remote sample location, were much lower than the legislative limits.



Aerial view of the Galatsi Water Treatment Plant in Athens where the real-time THM data provided by the THM-100™ helped EYDAP to understand how TTHM concentration and THM speciation composition are affected by changes in raw source water quality and chlorine contact time.