aqua metrology systems

APPLICATION BRIEF

California American Water Manages Hexavalent Chromium Contaminant Levels in Real-Time

More than 300 public water utilities across California have elevated levels of Hexavalent Chromium [Cr(VI)]. As a result, many utilities are turning to real-time data to identify contaminant threats and diagnose critical treatment system performance.

One such utility, California American Water, which delivers clean, safe water and wastewater services to 675,000 people, was experiencing elevated Cr(VI) levels at two of its well sites — Moonbeam and Oak Forrest/Citrus Heights. Cr(VI) levels were in the 25 ppb range after well water was filtered with granular activated carbon (GAC) and before being stored at a 5,000-gallon hydro tank.

Extensive research didn't uncover the cause of the Cr(VI) load to the GAC filters, and without timely and accurate chromium analysis, California American Water would not be able to keep these wells open. As a result, the utility turned to Aqua Metrology System's (AMS) MetalGuard™, a fully automated, online multi-stream Cr(VI) analyzer which provides high-frequency real-time data on chromium contaminant levels in 30 minutes with sensitivity down to 1 ppb, allowing utilities to monitor and address critical steps in their remediation process.

California American Water installed AMS's online, MetalGuard Cr(VI) analyzers, which allowed it to monitor and address critical steps in its remediation process.

The Cr(VI) analyzers were installed and connected to the motor starter of the wells — Oak Forest/Citrus Heights was installed in February 2017 and Moonbeam in February 2018. To date, the analyzers at the two sites have collected 39,254 samples at Oak Forest/Citrus Heights and 20,493 samples at Moonbeam, both analyzers have an uptime reliability of 99%. If the analyzers detect Cr(VI) at 10 ppb or above, the well is automatically shut off. An operator would then take a sample which is sent to a lab, and if the lab values correlate with the Cr(VI) analyzer values, the systems is flushed and retested before being put back online.

According to Lacy Carothers, P.E., Project Manager for California American Water, "The MetalGuard Cr(VI) analyzer enabled California American Water to have higher visibility of contaminant levels in real-time. The fast and reliable online data allowed us to maintain the wells operational while continuing to deliver safe drinking water to our customers."

Although the maximum contaminant level (MCL) for Cr(VI) in California was invalidated in 2017, the California State Water Resources Control Board (Water Board) "hopes that the wealth of data obtained during the nearly three years the MCL has been in place will enable the board to adopt the new regulation more quickly."

As new science about Cr(VI) and its impact on public health continue emerge, the MCL for Cr(VI) in California, and potentially on the federal level, may be lowered to near natural background levels, far below the current total chromium MCL of 50 µg/L. Thus, the California Water Board encourages public water systems that have already installed and are operating treatment systems for hexavalent chromium to continue to operate these treatment facilities.

MetalGuard™ Chromium Analyzer

Utilities employing drinking water remediation techniques to address Cr(VI) contamination must measure influent and effluent chromium levels to adequately control and optimize water treatment and removal processes. MetalGuard Chromium provides real-time, multi-stream reliable and accurate analysis of Cr(VI) to ensure compliance with regulatory requirements. The analyzer features a robust and stable design that is capable of maintaining its sensitivity and calibrated status for an unlimited timeframe while operating reliably regardless of sample matrix conditions. The analyzer provides high-frequency real-time data on Cr(VI) contaminant levels in 30 minutes with sensitivity down to 1 ppb.

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