

## SafeGuard™ H2O Hexavalent Chromium (Cr6) Demonstration at the City of Banning Water Treatment Plant



The City of Banning, California, is a community of about 30,000 people. The city relies on well water with high levels of hexavalent chromium (Cr6) for its drinking water supply.

In 2017, when the city began to evaluate Cr6 treatment solutions, the best available technologies were expensive in terms of capital and operating costs. For example, one viable technology was estimated to cost up to \$35 million and required upwards of \$700,000 a year to operate—a significant cost, especially for a community of Banning's size. Alternative solutions for reliable and economical treatment of Cr6 were needed.

In July 2022 the city undertook a demonstration of the efficacy of the SafeGuard™ H2O in-situ reagent generation system developed by Aqua Metrology Systems (AMS) to remove Cr6 down to non-detect levels and significantly reduce the cost of removing this contaminant from their water.

For AMS, this demonstration is a combination of five years of innovation by a multidisciplinary team and a total technology development cost estimated to be around \$10 million. According to Rick Bacon, CEO of AMS, investment in the water industry is not a slam dunk. "We didn't just turn up to demonstrate the SafeGuard™ H2O technology," Bacon said. "Being here is the result of building trusting relationships with cities, engineers, the people we have to work with, the regulators ... all to be able to deploy this technology."

The fully automated SafeGuard™ H2O technology uses a certified precursor and an in-situ electrolytic generator to create a non-toxic stannous reagent onsite and on demand. The process is simple, effective, and carbon neutral. The technology supports small, underserved communities across California for whom traditional Cr6 treatment technologies are too expensive and complex to operate.

SafeGuard™ H2O features automatic dosing and incorporates proprietary continuous, real-time monitoring of Cr6 levels at the influent and effluent to ensure optimal treatment and compliance with regulatory and operational targets 24/7/365. Because the system can be fully controlled, monitored, and optimized remotely, the presence of personnel on site for supervision is minimized, further reducing operating costs compared with strong-based anion exchange (SBA) treatment systems.

“Real-time monitoring is one thing that sets this demonstration apart from anything else we’ve seen in the industry. We are constantly monitoring the performance of our technology, and streaming it live. The purpose of doing it is to show the confidence we have in this technology, and the value of being able to constantly monitor the performance of a treatment system and publish these results. Essentially, it’s the democratization of water quality data. We hope that the more people know about the quality of the water they drink, the more comfortable they will be using water from the tap as opposed to a plastic bottle,” Bacon explained.

The SafeGuard™ H2O technology deployed to the City of Banning is treating a small fraction of the well water (3-gpm) at the location. While 3-gpm represents a tiny share of the proportion of the water coming from the well, the technology would eventually scale up for the City of Banning Water Treatment Plant and its multiple wells to provide an affordable, non-hazardous, and environmentally sustainable remediation solution.

AMS and NCS Engineering hosted a live demonstration of the SafeGuard™ H2O technology at an Open House event at the City of Banning Water Treatment Plant. Participants received an inside look into this groundbreaking technology and had a chance to hear from industry experts in the design and treatment of this affordable, non-hazardous, and environmentally sustainable Cr6 remediation solution and its features compared to SBA treatment technologies.



Highlights from the live demonstration of the SafeGuard™ H2O technology at the Open House event at the City of Banning Water Treatment Plant. *Top (left to right):* Fred Gerringer, D.Env., P.E., BCEE., West Region Water Reuse Practice Leader at Hazen and Sawyer, and Vladimir Dozortsev, Ph.D., Senior Product Manager, AMS. *Bottom (left to right):* Vladimir Dozortsev, Ph.D., Lauren Kenyon Enright, Founder, Axiom Climate, and Rick Bacon, CEO, AMS.

## SafeGuard™ H2O Features Compared to SBA Treatment

- Fully automated in-situ reagent generation system that includes real-time online Cr6 monitoring
- Certified precursor ensures the quality of the reagent
- Compact modular design easily integrates into existing infrastructure
- Low power consumption, supports carbon reduction goals
- Requires low amounts of consumables to reliably remove Cr6 to <1 ppb
- Generates low amounts of non-toxic dewatered waste which can be potentially reused
- Highly selective, not impacted by raw water matrix
- Low risk treatment approach with easy to remove non-toxic waste residuals