



Aqua Metrology Systems: Putting Climate at the Heart of Water Treatment

Unsustainable approaches to water treatment are pervasive, partly due to a lack of real-time data. H2O Global News caught up with Rick Bacon, CEO of Aqua Metrology Systems (AMS), to discover how a potent combination of accurate insights and eco-friendly treatment methods can help build an industry fit for the future.



Rick Bacon

Headquartered in Silicon Valley, AMS provides real-time analytical and remediation solutions to predict, control and treat regulated contaminants in water and wastewater supplies. Founded over 10 years ago, the company started out developing and offering water monitoring solutions, and has since branched out into water treatment as well.

Why water treatment?

Monitoring for inorganic and trace metal contaminants gave us a unique view into the inherent inefficiencies of traditional water and wastewater treatment plants (WTPs/WWTPs). Our data revealed that facilities were wasting energy and chemicals, which was not only affecting their bottom line but environmental impact as well.

That is why we launched SafeGuard™ H2O, which is a low carbon, environmentally sustainable in-situ reagent generation technology proven to remove a wide range of heavy metals and nutrients from water and wastewater. The system is calibrated to treat various contaminants, for example, arsenic or hexavalent chromium, and works in tandem with an online water quality monitor—so you know that it is removing the right contaminants and in sufficient quantities. By integrating real-time analytics and monitoring with our water treatment system, we can offer an all-in-one solution to WTPs/WWTPs that reduces the overall operational carbon footprint and the handling of toxic bulk chemicals.

What are some of the climate challenges facing the water industry?

When most people think of the 'water industry' they picture municipal water utilities, but it is bigger than that. Industries like agriculture, mining and semi-conductors have an equal if not greater role in managing water resources and adapting to climate challenge.

For the coal fired plants and mining industries, floods and storms threaten to overwhelm their process waste containment systems which can

cause pollutants to enter our waterways. While for municipalities, their biggest concern is dealing with a severe reduction in water quality and quantity. More broadly, the whole water sector needs to prepare for, and adapt to, extreme weather events that result from climate change.

How do you help the water industry rise to the challenge?

With real-time data, WTPs/WWTPs can make informed decisions. If you know the quality of your water, you can reuse more of it—reducing net intake. Monitoring also provides an early warning system for contaminant outbreaks, which improves compliance and reduces pollution downstream.

Overall, it helps water managers, both in industry and municipalities, to optimize the entire system and reduce carbon emissions. This also applies to the planning and construction of new treatment works. Without good data you can't design an efficient plant because engineers will always build bigger—and produce more carbon—to accommodate uncertainties. However, if you have real-time, accurate insights you can build a more efficient, adaptable facility that is suited to the actual demands of that specific site.

On the treatment side, SafeGuard™ H2O reduces the need for bulk toxic chemicals like ferric salts, organosulphide and ozone, which produce substantial emissions across their supply chain. The reagents produced by the SafeGuard™ H2O system are harmless to the environment and they can be produced using renewable energy. The SafeGuard™ H2O process can also recover valuable resources that would otherwise be disposed of wastefully.

Something else that we feel very strongly about is the issue of equity. The impacts of climate change are felt most acutely in small, underserved communities and part of the problem is that large, centralized treatment systems are not scalable to the needs of small communities, especially in remote areas. The great thing about our monitoring and treatment systems is that they can cater to the needs of both very small and very large communities. When it comes to adapting to climate change, that flexibility is critical.

How can we accelerate water technology innovation?

A barrier to innovation in water technology is industry-wide inertia. People are still doing things the way they have been done for the past 50 years. Given the emergency of the climate crisis, the water industry can't afford to keep making uniformed decisions today that will compromise our ability to reach net zero in the future. The more unsustainable infrastructure we build today, the harder it will be to clean up the mess tomorrow.

Innovations must be sustainable. It's no good inventing a new ion exchange resin or reverse osmosis process, for instance, that still leaves behind toxic contaminants that require yet further treatment.

Furthermore, innovations must be scalable to utilities of every shape and size. If we just keep solving for big cities the rest of the population will get left behind. When it comes to accelerating innovation in water technology the buck stops with the stakeholders. Engineers are one of the key decision-makers who need to start putting sustainability at the heart of water treatment plant design and operation.

It's not just the engineers that have a responsibility for driving change, water technology vendors must look beyond making a quick sale and then moving onto the next client. They need to tackle the lifetime costs of their technology and the client's long-term needs.

The way forward?

We need to act now and without innovation we won't be able to rise to the climate challenge or remain profitable in a context of diminishing margins and ever-tighter regulations.

We need more data. With proper water monitoring, stakeholders can see exactly where their systems are performing and where they are failing, and they can innovate or adopt new technologies based upon that information.

We need more education. It is shocking how many young engineers have never been trained to look at sustainability in their designs and build a sustainable water treatment plant. Furthermore, the way projects are planned, evaluated, budgeted for, and approved must consider the costs across the lifecycle.

Regulators also play a role. Whether it is the EPA in the U.S., the EEA in Europe or the AECEN in Asia; federal, state and local regulatory agencies need to make sustainable, safe, energy-efficient water treatment plants the standard, not the exception.

And last but not least, we need to hold the solution providers' feet to the fire. Clients should demand that suppliers offer performance-based pricing that is backed by data.