cleanwater1

CASE STUDY

MAUI DEPARTMENT OF WATER SUPPLY (DWS)

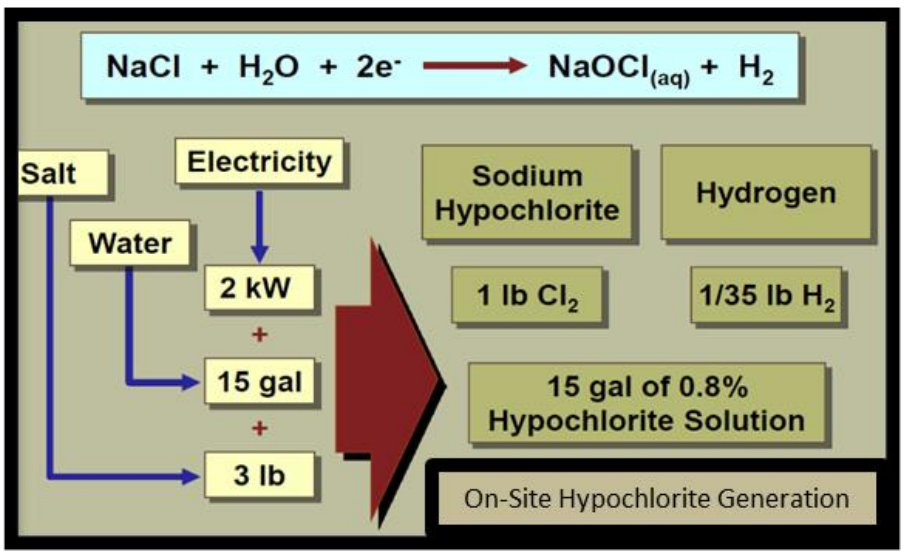
Maui Water Achieves Greater Independence and Increases Operational Resiliency by Generating Bleach On-Site

OVERVIEW

The County of Maui Department of Water Supply (DWS) is responsible for providing drinking water to over 36,400 service connections across three islands. The agency supplies 33.5MG of drinking water each day through a system that includes six surface water treatment facilities, 145 storage tanks with a combined storage capacity of 295 MG, and roughly 750 miles of distribution pipelines.

In 2016, officials at DWS were informed that their sole supplier of chlorine gas planned to cease providing the product in June of 2017, giving them roughly one year to get new disinfection systems up-and-running at six surface water treatment plants and three well sites.

As DWS officials evaluated alternatives to gas chlorine, they sought autonomy from chemical supply companies serving the Hawaiian Islands. Additionally, they wanted a technology that would increase safety and resiliency in case of a natural disaster. Officials performed an evaluation of alternative forms of chlorine bleach by comparing both the capital equipment and operating costs, as well as the costs and risks of handling hazardous materials. DWS compared bulk sodium hypochlorite, calcium hypochlorite, and on-site sodium hypochlorite generation (OSHG). Recent changes in local safety standards required DWS to reduce or eliminate hazardous materials used in proximity to local schools. The sodium hypochlorite produced on-site, at 0.8% concentration, met the requirements since it is below the hazardous material threshold of 1%. The OSHG option satisfied DWS's need for safety, autonomy and resiliency, while still achieving the lowest overall life cycle cost.



Disinfection Option	Cost Per Pound of Free Chlorine	Capital Cost	Safety
Gas Chlorine	$1.10 - $1.30	Low	Hazardous Gas
Bulk Sodium Hypochlorite	$3.50 - $4.50	Low	Hazardous Liquid
Calcium Hypochlorite	$3.85 - $4.50	Low	Hazardous Solid
On-Site Generated Sodium Hypochlorite (OSHG)	$1.05 - $1.30	High	Non-Hazardous Liquid

After settling on OSHG, DWS officials began to evaluate technology providers. DWS wanted more than just an equipment supplier. It sought a trusted partner with an established track record of success; a technology and service leader that could provide training, expertise and support, both locally and from the mainland. DOW employed a modified design/build approach in order to maintain control over the technology selected and to achieve the project goals by the required completion date. DOW chose the patented OSHG technology of PSI Water Technologies and selected Aqueous Vets to both supply and install PSI's Microclor® OSHG systems. The Microclor® OSHG system features the latest technology in on-site generation, including vertically-oriented electrolytic cells to ensure safe evacuation of hydrogen gas by-product and a modular system that offers a small footprint requiring less space than other on-site disinfection systems.

Aqueous Vets was contracted by DOW in February 2019 to design and install Microclor® OSHG systems at four separate water treatment plants. The systems' chlorine generation capacities ranged between 60 and 200 pounds per day of free available chlorine. The project required all four systems to be up-and-running by June 30, 2019. As the contractor and supplier, Aqueous Vets had total contract responsibility to design, deliver, install and commission the systems prior to the June 30th deadline. Field work commenced on May 13th and was completed by June 21st. Full conversion to sodium hypochlorite generation was completed on-time and on budget with no change orders.

"The Microclor® OSHG systems are a safer, cost-effective alternative to gaseous chlorine. The systems are working very well. The operators, even the ones who were originally skeptical, are VERY happy with OSHG and the Microclor® systems in particular."

- Tony Linder, Division Chief, County of Maui Department of Water

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Hypochlorite storage tank, brine tank and pallet with bags of salt