

### Overview

Silver Bullet Water Treatment's (SBWT) patented Advanced Oxidization Process (AOP) solution is used primarily for microbial control and water disinfection. However, the AOP also is used to effectively oxidize select metals and reduce the level of various organohalides. Simply put, organohalides are carbon-based molecules that include one or more halogen (column 17 of the periodic table including fluorine, chlorine, bromine, etc.).

There are several sub-groups of organohalides including halogenated volatile organic compounds (VOCs), haloacetic acids (HAA) and trihalomethane (THM). Many of these chemical groups are regulated and considered to be toxic to humans and the environment.

### Examples of Organohalides

The number and variety of organohalides are extensive and as such, its impractical to evaluate SBWT's AOP treatment efficacy on all of them. Instead, several common examples have been selected due to their relative prevalence and industrial significance. By looking at the properties of these examples and comparing them to other similar organohalides, preliminary treatment expectations can be deduced.

The following table outlines several organohalides that have been specifically evaluated for reduction rates following treatment with SBWT AOP technology.

TRIHALOMETHANE (THM)		
Chloroform	<chem>ClC(Cl)Cl</chem>	Known carcinogen
Dichlorobromo-methane	<chem>ClC(Cl)Br</chem>	Kidney, liver and brain damage, increased risk of cancer
Chlorodibromo-methane	<chem>ClC(Br)Br</chem>	Mild irritant, increased risk of cancer
Bromoform	<chem>BrC(Br)Br</chem>	Irritant, known carcinogen

HALOACETIC ACIDS (HAA)		
Chloroacetic Acid	<chem>ClCC(=O)O</chem>	Skin and eye irritant, poisonous, increased risk of cancer
Dichloroacetic	<chem>ClC(Cl)C(=O)O</chem>	Known developmental toxin to lungs, liver reproductive system
Trichloroacetic Acid	<chem>ClC(Cl)C(=O)O</chem>	Skin and eye irritant, poisonous, increased risk of cancer
Bromoacetic Acid	<chem>BrCC(=O)O</chem>	Corrosive to skin, eyes, and respiratory system
Dibromoacetic Acid	<chem>BrC(Br)C(=O)O</chem>	Corrosive to skin, eyes, and respiratory system

Source: EPA

### Case Study Data

Silver Bullet Water Treatment's AOP technology was applied to a commercial water body that struggled with THMs and HAAs. Following an initial treatment period, samples were taken and analyzed for the compounds list above according to protocol. *The resulting data showed a reduction of 91.5% in HAA and 84.8% reduction in THM. Notably, 68.9% of the present chloroform, a known carcinogen, was removed.*