



It's Your Water Podcast Show Notes

The Troublesome Trio – Iron, Manganese & Hydrogen Sulfide

Hosts: Mike Urbans & Mike Heatwole

Series: Summer School Replay

Episode Overview

In this episode, Mike Urbans welcomes industry veteran Mike Heatwole of A. O. Smith North America Water Treatment to discuss what water professionals have long referred to as the 'Troublesome Trio' — iron, manganese, and hydrogen sulfide. While hardness is often the most common water quality concern, these three nuisance contaminants are responsible for many of the staining, odor, treatment failures, and troubleshooting challenges dealers encounter in the field.

Understanding the Troublesome Trio

The term 'Troublesome Trio' refers to three common well water contaminants: iron, manganese, and hydrogen sulfide (H₂S). These contaminants frequently occur together and can create staining, odors, taste issues, equipment fouling, and customer dissatisfaction when not properly treated.

Why Manganese Is Often the Most Difficult

Manganese stains at much lower concentrations than iron, oxidizes more slowly, can pass through systems designed primarily for iron removal, and often requires careful attention to pH and oxidation conditions.

Iron: More Than Just Red Water

Iron may appear as ferrous iron, ferric iron, iron bacteria, or colloidal iron. Understanding which form is present is essential for selecting the correct treatment approach.

Hydrogen Sulfide and the Rotten Egg Odor

Hydrogen sulfide is a dissolved gas associated with rotten egg odors, corrosion, and customer complaints. Because it escapes rapidly when water is exposed to air, field testing is strongly recommended.

Common Treatment Technologies

Common treatment options include water softeners, air injection systems, ozone oxidation systems, catalytic carbon filtration, greensand-type media, pyrolusite-based media, zeolite filtration media, and ultrafiltration.



The Importance of On-Site Testing

The hosts stress the importance of testing iron, manganese, hydrogen sulfide, pH, flow rates, and visual water conditions before recommending treatment equipment.

Why Ozone Continues to Gain Popularity

Ozone provides faster oxidation, improved sulfur removal, reduced bacterial fouling, enhanced media performance, and improved treatment reliability.

Comparison Table: Iron vs Manganese vs Hydrogen Sulfide

Contaminant	Primary Symptoms	Common Challenges	Typical Treatment
Iron	Red/brown staining	Bacteria, colloidal forms	Softeners, oxidation, filtration
Manganese	Black staining	Slow oxidation kinetics	Oxidation, specialty media, filtration
Hydrogen Sulfide	Rotten egg odor	Gas escapes testing	Air injection, ozone, catalytic carbon

Top 5 Dealer Takeaways

1. Iron, manganese, and hydrogen sulfide are often found together and should be evaluated as a complete water chemistry package.
2. Manganese can be more difficult to remove than iron because its oxidation kinetics are slower.
3. Hydrogen sulfide must be tested on-site because dissolved gases escape quickly once water is depressurized.
4. Many treatment failures occur because the water was not properly tested before equipment selection.
5. Oxidation technologies such as air injection and ozone can dramatically improve contaminant removal performance.