

# Iron

**USEPA Contaminant Classification:** Secondary, (non health-related)  
**EPA Maximum "Safe" Levels:** 0.3 mg/l\*

**Source:** Iron is mostly leached out of ore-bearing rocks and soil by acid rain, (the average pH of rainwater is 5.6, but may even be more acidic (4-5) in some regions due to atmospheric pollution). This is known as soluble, reduced or "clear water iron". It is called "clear water iron" because the water out of the tap appears clear at first. After it sits and is exposed to the air, (oxidizes) it becomes reddish-brown. Iron can also be added to the water in either particulate or soluble form from old and/or rusted plumbing. Iron in the water may interfere with water treatment and may even support the growth of iron bacteria, (iron algae). Iron bacteria produce as a by-product Hydrogen Sulfide, which if bacteria are plentiful may cause a noticeable "rotten egg" smell to the water. **Iron levels as low as 0.12 ppm may cloud the water and stain laundry and plumbing fixtures orange-brown.**

\* **Health Effects:** Iron may interfere with water treatment. During chlorination, iron by combines with chlorine to form Ferric Chloride, which is not as effective as free chlorine in killing bacteria. High iron levels in water, by interfering with chlorination, may allow some bacteria to survive and flourish in treated water supplies. There is no evidence that ingesting iron in the amounts water can hold can cause any discernable health problems. Iron in levels above 5.0 ppm may make the water taste and smell so bad as to render it undrinkable without treatment.

**Home Damage Effects:** Iron in fairly low levels may cause orange-brown staining on plumbing fixtures, sinks, toilets and laundry. Iron bacteria/algae that are associated with the presence of soluble iron also cause a brownish-green slime forming in the pipes, especially at effluent areas. These bacteria cause a "rotten egg" smell in the water by releasing Hydrogen Sulfide. Hydrogen Sulfide can be altered to form Sulfuric Acid, which decreases water pH, (acidifies) and can promote deterioration of the plumbing.

## How to Fix Contaminated Water:

- 1. Softeners/Conditioners-** These units are effective at removing clear water iron at levels up to 3-5 ppm depending on water pH. These units automatically clean their resin beds with a strong brine (salt) solution.
- 2. Automatic Iron filters-** Similar to conditioners, these units utilize "special" media specifically designed to remove iron from water. These systems can remove iron up to levels of 8-15 ppm. Resin maintenance usually requires a strong cleaning agent such as (Potassium Permanganate) which is caustic and difficult to handle.
- 3. Aeration Systems-** These systems neutralize the water and inject when the homeowner uses water. The air oxidizes, (precipitates) the iron which is captured by a sediment filter which cleans itself automatically. These systems can remove up to 40.0 ppm of soluble iron.