

Iron and manganese removal:

Iron and manganese control is the most common type of municipal water treatment. Iron and manganese occur naturally in groundwater. These elements are in fact, essential to the human diet. Water containing excessive amounts of iron and manganese can stain clothes, discolor plumbing fixtures, and sometimes add a “rusty” taste and look to the water. Surface water generally does not contain large amounts of iron or manganese, but iron and manganese are found frequently in water systems that use ground water. Iron In drinking water is 0.3 parts per million (ppm) and 0.05 ppm for manganese.

- Iron and manganese minerals are found in soil and rock.
- Iron and manganese can dissolve into groundwater as it percolates through the soil and rock.
- more than 0.3 mg/l of iron will cause yellow to reddish-brown stains of plumbing fixtures or almost anything that it contacts.
- Manganese even at levels as low as 0.1 mg/l, will cause blackish staining of fixtures and anything else it contacts.
- If the water contains both iron and manganese, staining could vary from dark brown to black.
- Iron and manganese in well waters occur as soluble ferrous and manganous bicarbonate.

IRON AND MANGANESE REMOVAL BY AERATION:

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Iron and Manganese Removal by Filtration:

Removing iron and manganese from drinking water instead of sequestration it is recommended if the water contains over 0.3 ppm of iron or 0.05 ppm of manganese. These elements can be removed during softening with lime, but most commonly iron and manganese is removed by filtration after oxidation (with air, potassium permanganate, or chlorine).

Gravity and pressure filters are both used, with pressure filters being the more popular. The operator should frequently check to see that all the iron in the water entering the filter has been converted to the ferric (or insoluble particulate) state. The operator collects a water sample, passes it through a filter paper, and runs an iron test on the clean, filtered water (filtrate).

If no iron is present, it has all been oxidized and is being removed in the filtration process. If iron is found in the filtrate, oxidation has not been complete and some of the iron will pass through the filter and end up in the treated water. In this case, the operator should consider adjustments to the oxidation process.

Most iron removal filters are designed so that the filters are backwashed based on head-loss on the filter. If iron breakthrough is a problem, the filters will have to be backwashed more frequently. Accurate records will reveal when breakthrough is expected so that the operator can backwash before it is likely to occur.

