**Section 604.1010 Iron and Manganese Control**

a) Except as provided in 35 Ill. Adm. Code 611.300(e), treatment is required to meet the iron and manganese MCL as stated in Section 611.300(b).

b) Removal of Iron and Manganese by Oxidation, Detention, and Filtration

1) Oxidation must be by aeration, as indicated in Subpart D, unless the community water supply demonstrates chemical oxidation provides equivalent results to aeration. Chemicals that may be used for oxidation include chlorine, sodium permanganate, potassium permanganate, ozone, or chlorine dioxide.

2) Detention

A) A minimum detention time of 30 minutes must be provided following aeration to ensure that the oxidation reactions are complete prior to filtration. This minimum detention time may be modified only when a pilot plant study indicates completion of oxidation reactions in less time.

B) The reaction tank/detention basin must be provided with an overflow, vents, and access hatches in accordance with Subpart M.

3) Filtration. Filters must conform to Subpart F.

c) Removal by Manganese Greensand or Manganese Coated Media Filtration

1) Permanganate or chlorine must be added to the water upstream of the filter, per the manufacturer's recommendation.

2) An anthracite media cap of at least six inches must be provided over manganese greensand.

3) Normal backwash rate is 8 gal/min/ft2 with filters containing manganese greensand and 15 gal/min with manganese coated media.

4) Sample taps must be provided:

A) prior to application of permanganate;

B) immediately ahead of filtration;

C) at points between the anthracite media and the manganese greensand;

D) halfway down the manganese greensand; and

E) at the filter effluent.

d) Sequestration of Iron or Manganese by Polyphosphates

1) Sequestration by polyphosphates must not be used when the combination of iron and manganese exceeds 1 mg/L.

2) Phosphate solution must be kept covered and disinfected by carrying approximately 10 mg/L free chlorine residual unless the phosphate is not able to support bacterial growth and the phosphate is being fed from the covered shipping container. Phosphate solutions having a pH of 2.0 or less may also be exempted from this requirement by the Agency.

3) Polyphosphates must not be applied ahead of iron and manganese removal treatment. The point of application must be prior to aeration, oxidation, or disinfection.

4) The phosphate feed point must be located as far ahead of the oxidant feed point as possible.

e) Sequestration of Iron or Manganese by Sodium Silicates:

1) Sequestration by sodium silicate must not be used when iron, manganese, or a combination of iron and manganese exceeds 2 mg/L.

2) A full-scale demonstration will be required to determine the suitability of sodium silicate for the particular water and the minimum feed needed.

3) Chlorine or chlorine dioxide addition must accompany the sodium silicate addition.

4) Sodium silicate must not be applied ahead of iron or manganese removal treatment.

(Source: Amended at 47 Ill. Reg. 7503, effective May 16, 2023)