



DEALING WITH IRON ISSUES IN GROUNDWATER SYSTEMS

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As I travel and provide technical assistance to the vast number of municipal water systems serving the rural communities of Western NY, one topic seems to pop up more often than others. Operations Specialists frequently say, “we were a spring fed system, now we are dealing with wells”. Over the years many spring fed sources have been examined and are now considered as ‘Ground Water Under the Direct Influence of Surface Water’. GWUDI. Systems large and small are required by the DOH to filter their source, and are regulated in the same manner as a surface water source. When a determination is made, water systems and their representatives need to debate and decide whether to abandon or filter the spring, drill wells, or connect to a neighboring system that can meet the demands. Generally, not all these options will be readily available, making the decision a little easier on those involved.

While filtering, the spring source is a great alternative. It can be quite expensive and may require the Operations Specialists to become certified at a different grade level, or may even require the hiring of a certified backup. Well drilling is not always an alternative either, as the system still needs a source of high quality water with adequate supply to meet demand. Many of the systems on my circuit have opted for the well system as their alternative.

For some water systems, filtering a GWUDI source is the most cost effective and efficient way to proceed, as groundwater of acceptable quantity and quality are not readily available. However, electing to develop a new groundwater source (well) will allow the system to maintain regulatory compliance at existing levels, versus having to comply with the much more stringent regulations related to operating a surface water treatment system. In either case, great care and consideration should be exercised, and the system must reach out to engineers and local health representatives for design options and approvals.

Some groundwater sources can be high in Iron. The thing that you’ll notice the most from water that is high in iron is that the water may taste metallic. The water may be discolored and appear brownish. We will take a look at the most common forms of iron in groundwater and how to deal with them.

BACTERIAL IRON

Iron bacteria is usually identified by slime in places such as toilet reservoirs or by the presence of a slimy film.

FERROUS IRON

Often called “in solution” or “clearwater iron” because although clear when poured, if your water comes out of the tap looking clear but turns a yellow or rusty brown color after sitting out in the open, it may be ferrous iron, iron that has not been exposed to oxygen and has not “oxidized”. Typically from deeper wells and groundwater sources. When exposed to oxygen it

becomes **ferric iron**.

FERRIC IRON

When ferrous iron is oxidized it changes to ferric iron. Ferric iron is also known as red water iron or iron that has precipitated out of solution. When iron-bearing water comes into contact with chlorine or oxygen, it changes from a solution to a particle through the oxidation process.

There are several treatment options for iron. Bacterial iron - chlorination at a higher dosage with carbon filtration to reduce the chlorine. Ferric and ferrous iron-oxidation then filtration typically with a green sand filter, and sequestration, done with a sodium silicate, or a poly-phosphate product. These products added before chlorination bind the iron and keep it in solution.

Proper dosage can be achieved by stain testing. When choosing a solution, the poly-phosphate product can create a problem with algae blooms at the sewage treatment end of the process.

In conclusion, iron treatment can sometimes be as expensive or more expensive than filtering a spring fed source. Whatever course you take, there are systems out there that have experienced the same or similar issues. If you require any assistance with these or other matters, please remember the staff here at the NYRWA are here to help. I may be contacted at Holley@nyruralwater.org or call toll free 1-888-697-8725 ext. 24 💧💧💧