



Specialized Systems

Air Scour Media Cleaning System

Application:

Manganese “Mudball” removal

System Design:

GreensandPlus Filtration for the removal of Manganese from ground water source

Date: 1-6-2021

Additional documentation:
Support reading material link to H&T web site

www.Hungerfordterry.com

In many water treatment applications around the world there are water quality characteristics that create challenging operational conditions. In many of these cases simple backwashing with water is not sufficient to remove captured particulate from the media bed and additional steps are required. In these cases the introduction of air during the backwash cycle can be the solution.

In most cases with water treatment, the decision to include air in conjunction with the water backwash cycle is related to the raw water quality conditions. These conditions determine the loading rate of particulate captured in the filter media and subsequently how often the backwash cycle is required.

In the process of removing Iron & Manganese from ground water, it is possible that over time the Manganese can form sticky gelatinous globules that are referred to as “Mud Balls”. These Mud Balls can accumulate together and become difficult to remove under normal water backwash cycles. It is in these conditions that the introduction of air is a benefit, but some manufacturers have different ideas on how to economically achieve the best cleaning.

Some manufacturers feel that injecting the air into the under drain piping is sufficient but this assumes that the same nozzles designed for water flow are suitable for air flow. Others feel that using a header laterals piping system positioned in the media but with a vessel full of water is adequate to clean the media.

At Hungerford & Terry we feel that our +110yrs experience has perfected this process with **“Air Scour”**.



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THE AIR SCOUR PROCESS

At Hungerford & Terry we feel that if the media is not exposed to a turbulent condition produced by the proper air flow for a prolonged period of time, the Manganese mud balls that form will not be broken apart.

The only way to ensure this process is to reduce the amount of water in the vessel. The *Air Scour* step is part of the total backwash process which includes draining the water level down to several inches above the top layer of media. Once the water level is lowered the air blower is turned on and allowed to run for a predetermined period of time. This lower water level and air blower sequence creates an extremely turbulent zone where the media and trapped particulate impact each other in a abrasive slurry that breaks up the manganese mud balls which can then be backwashed out.

Below is an image of the surface of the water inside the vessel during *Air Scour*. The image below is of the media being mixed into a slurry with uniformly distributed air.



Horizontal Filter media in Air Scour mode



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Continued- While the *Air Scour* sequence is running, the vessel is then filled from the bottom while the blower is on to keep the contaminants suspended. Once all the air has been purged from the vessel, the high water flow cycle is initiated for the duration of the backwash process. This sequence ensures that the contaminants are broken into small pieces, lifted to the top of the vessel with the bed expansion of 40%, and then out the backwash collector piping providing a more thoroughly cleaned media bed.

Depending on the design criteria the Air Scour piping may be installed at different elevations in the vessel. The below picture shows the header-lateral piping configuration being installed at the top graded gravel layer.





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What are the benefits?

By incorporating Air Scour into your filter design you can realize:

- **Longer media life**
 - Fewer rehab projects / media replacement
- **Longer runtimes between backwash cycles**
 - Higher production volume/time
- **Lower “Clean Bed” Differential Pressures**
 - Reduced pumping energy cost

All three of these points reduce operational cost!

Since 1909 Hungerford & Terry Inc. sets industry standards in engineering, design and manufacture of innovative and efficient water treatment systems.

Systems include removal of Iron, Manganese, Arsenic, and Radium; High-efficiency / low-waste Nitrate removal; PFOS/PFAS, Color removal, Chrome-6 removal, Perchlorate removal, Degasifiers Towers, Condensate Polishers and complete Demineralizers for Boiler Feedwater for the Energy sector.