

Case Study

Replacing Media & Gravel in Gravity Filters

Kearney, MO

The Challenge

The Owner experienced rapidly forming calcium carbonate deposits in addition to older inorganic deposits and various microorganisms causing biofouling. The result was a significant decrease in filtered water production and a significant increase in personnel maintenance and periodic backwashing. Through consultation with the Owner, it was determined that the Owner preferred full replacement of all filter media and gravel to effectively return their dual-media gravity filters to at or near their intended design capacity and performance.

Methods & Results

Rehabilitation procedures for this project included proper confined space entry and a small amount of concrete wall repair, in addition to typical supply and installation of identical materials while protecting existing infrastructure and after performing filter inspections following removal of the old filter materials.

Two filters were isolated and taken out of service by the Owner. After an initial visual inspection while old materials were still in place, water levels were lowered to begin the first step of the rehabilitation process: vacuum removal and landfill disposal. Once all old media and gravel were removed, each filter basin was cleaned and all system components were inspected thoroughly, after which a plan was enacted to make all necessary repairs prior to placing new gravel and media. Once repairs were complete, the largest gravel size was carefully hand-placed in order to ensure protection of the aging underdrain system. After all large gravel was placed and leveled, subsequent layers of progressively smaller gravel sizes were installed and leveled. After all gravel and torpedo sand were installed, multiple backwashes were conducted in order to rinse out organics that may interfere with future disinfection and Bac-T testing to take place after filter media is installed.

Next, all silica sand was installed, leveled and backwashed, followed by careful installation of anthracite coal media to control nuisance dust generation. Each filter media was installed using AWWA-approved methods for rapid installation, and at least one backwash was conducted after each media was installed, followed by draining and removing fines. Finally, the Owner used additional backwashes and disinfection before collecting water samples for Bac-T testing, for the purpose of returning the filters to service. The entire process from time filters were taken out of service to the time they were put back into service was only approximately 2 weeks, and the Owner was very pleased with the rehab results that allowed their WTP to return to normal treatment capacity and capabilities.

