

CASE STUDY

RESTORED ANTHRACITE FILTER MEDIA
USING MEDIA MASTER® CLEANING



INTRODUCTION

Blue Earth Products® is the leader in innovative approaches to water quality standards. Our suite of products reduces chlorine demand and disinfection by-products (DBPs) in water systems by eliminating organic and inorganic scale, enabling utilities to comply with EPA Stage 2 DBP rules.

Operated by American Water, the Woodlane Ground Water Treatment Plant supplies water to the Mt. Holly, New Jersey, area. The well water is aerated, settled and then filtered through three pressure vessels containing manganese greensand/anthracite filter beds to remove excessive manganese. The media had been installed in 1992 and was scheduled for replacement in 2004 due to declining performance. American Water considered using Blue Earth Products' Media Master cleaning chemistry as a cost-effective alternative to media exchange.

The first step in the Blue Earth Products' cleaning process is to conduct an extensive laboratory analysis of the filter media to determine both the composition and extent of the contamination. This analysis also determines the optimal dosing required for thorough cleaning. Media samples from all three pressure filters were tested.

Microscopic analysis showed that the anthracite was completely covered by a black crust and brown, grainy deposits. The original anthracite surface was not visible. Additionally, the samples contained nickel-sized mud balls as well as other solid aggregates.

Numerous chemical combinations of Media Master and Floran® Catalyst were explored. The most effective combination was a two-step treatment using a total of 8 lbs of Media Master and 0.7 gallons of Floran® Catalyst per ft³ of filter media. This treatment protocol resulted in a dry weight loss of 5-7% and released 2,970 mg of manganese and 6,260 mg of iron from each kilogram of media.

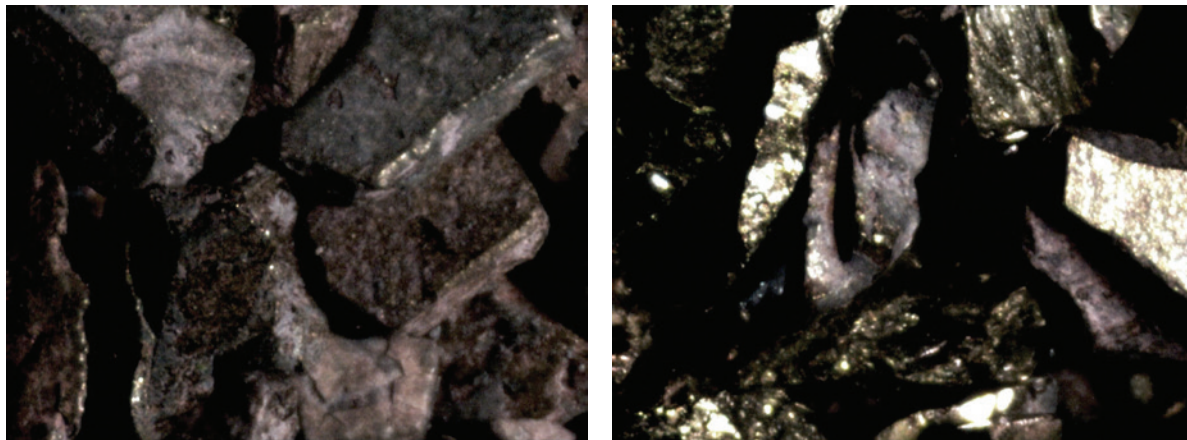


Figure 1 - Anthracite from pressure vessel 3 before (left) and after (right) Floran treatment

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RESULTS

The results of the full-scale media treatments were consistent with the laboratory test results. Manganese and iron concentrations in the backwash water after treatment were similar to those in the laboratory analysis. The treatment resulted in the complete restoration of the anthracite and removal of the excessive coating of the greensand (see Figure 1). A moderate manganese dioxide coating remained on the greensand, facilitating its reconditioning.

The cleaning procedure also removed significant manganese sludge from the vessels, which had built up over time and was not removed during backwashing. The manganese concentrations in the effluent from all three filters dropped from 0.05 ppm before the treatment to 0.01-0.02 ppm after.

DISCUSSION

Blue Earth Products' Media Master cleaning chemistry effectively returned 13 year-old greensand filters to near new operating conditions. The two-step chemical treatment was less than a third of the price of media replacement and saved the customer over \$100,000. The entire three-filter project was completed in one week and removed approximately 10,000 pounds of contaminants (based on estimates from the lab testing) from the filters with no noticeable side effects.

Blue Earth Products' operational personnel contacted the plant manager at American Water in June of 2010. The filter system (which was scheduled for replacement in 2004) has been operating effectively since the Media Master cleaning in 2005 and was still operating within specifications in 2010.

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