

HYDRAcap® MAX System Solves Turbidity and Bacteria Removal Issues at Drinking Water Plant



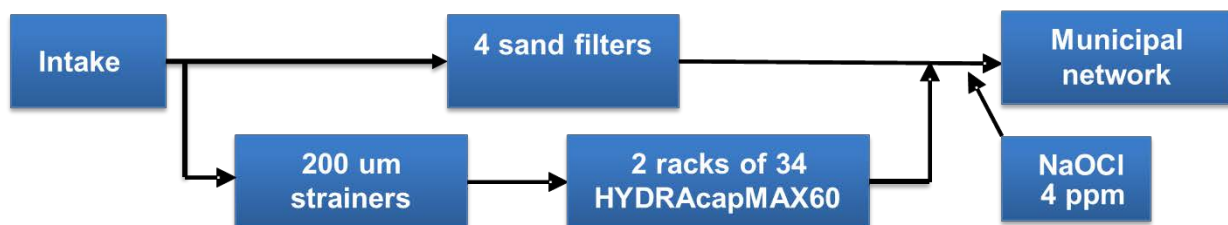
The Problem

A drinking water plant using sand filtration to treat surface water was not performing to expectation. Effluent bacteria and turbidity levels were high (see Figure 1 below) and the plant was unable to meet regulatory requirements as result. Chlorine dosing concentrations had to be increased for disinfection, which subsequently increased formation of disinfection byproducts.

The Solution

In order to improve plant effluent quality, an ultrafiltration (UF) system was installed in parallel to the sand filters. As shown in Figure 1 below, the sand filter effluent and the UF filtrate are blended before disinfection chlorination.

Figure 1: Process Flow Diagram



After 20 to 40 minutes of filtration (depending on variable feed water turbidity), the ultrafiltration system utilizes a unique backwash-free cleaning process. The membranes are physically cleaned by air scouring for 1.5 minutes. The modules are then drained, subsequently refilled and returned to filtration mode. This process decreases source water consumption by 3-4% compared to processes which use backwash. The membranes are chemically cleaned once per day with sodium hypochlorite at 200 ppm + sodium hydroxide at 1200 ppm (MC1+2) to remove organic and biological foulants and once per day with sulfuric acid at 1470 ppm (MC3) to remove inorganic foulants.

| System Description | |
|---------------------------------------|-------------------------------|
| Module Type | Hydranautics HYDRAcap® MAX 60 |
| Flow path | Outside to Inside |
| Membrane area | 78 m2 membrane |
| Membrane material | TIPS PVDF |
| Filtration flux | 75 l/mh |
| Filtration time | 20-40 minutes |
| Recovery | 98% |
| Maintenance cleaning frequency | One MC1+2/day One MC3/day |

| UF Performance | |
|-------------------------------|------------------------------------|
| Feed Turbidity | 1-50 NTU |
| Filtrate Turbidity | <0.1 NTU |
| Bacteria Removal | >5 log |
| Total Suspended Solids | <2 mg/L (Below Detection Limit) |

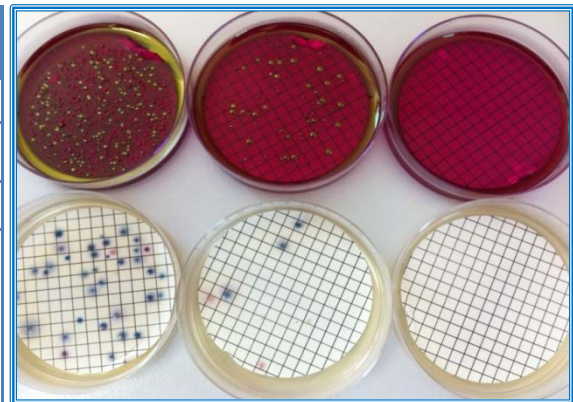


Figure 2: Influent, Sand Filter Effluent, HYDRAcap MAX Filtrate (Left to Right) – Total Coliforms (Top) and E-Coli (Bottom)

The Conclusion

The HYDRAcap® MAX system has completely removed bacteria and provides consistent water quality independent of feed water quality. HYDRAcap® MAX is an efficient, reliable way to meet bacteria removal requirements in drinking water applications.