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Title: Industry Challenges in Water Prefiltration

Abstract: Prefiltration is an important step in municipal water supply treatment systems. The keystone in many of these systems is either granular media filters or membranes. The Romans were using gravity media (sand) filters over two-thousand years ago to “purify” drinking water. People were undoubtedly doing this well before written history. Interestingly, millennia later, granular media filters are still the most prominent treatment for drinking water. However, while early Romans needed to treat only a few thousand gallons per day, today’s a treatment facility often treats hundreds of millions of gallons daily.

Real estate can become a big issue with media filters as the price of land skyrockets and needed water quantities rise. Little, other than brief sedimentation, is often used to pretreat before media filters. As facilities cry for more volume through smaller footprints, an unmet need is to remove much of the solids load before the media filters. In recent years, membrane systems have become a popular means of treating water for potable uses. Microfiltration, ultrafiltration, nanofiltration and reverse osmosis are all membrane technologies that have found a place in water treatment. None of these membrane systems can tolerate high suspended solids concentrations or large particle sizes. Pretreatment is required to remove most non-dissolved solids. Cartridges are appropriate technologies for this in some cases but their “commodity” status limits their economic optimization in many applications. Other pretreatment technologies are necessary to meet these needs.

Ask the people in Tampa Bay, Florida how important pretreatment is to a reverse osmosis membrane system. Expensive re-designs, additional equipment costs and delays were incurred when pretreatment was improperly addressed.

More emphasis needs to be, and will be, placed upon pretreatment for potable water treatment systems worldwide. Additional reasons for this emphasis will be addressed in the paper along with some technologies to meet this unmet need.