

Fixed Plate Cloth Filter Testing

MFC's fixed plate cloth media filter was first developed in 2005. The first full-scale unit was built and subsequently setup at the 40 MGD Madison Metropolitan Sewerage District (MMSD) in summer 2006. The unit operated successfully until it was taken down in Nov 2007. The test procedure and equipment were developed specifically for process testing of the innovative cloth media tertiary filter in cooperation with local fabricators and with the help and support of MMSD personnel.



SETUP:

MFC's cloth media filter system consists of a stainless steel tank containing four (4) rectangular, fixed plate cloth media elements each capable of treating an average daily flow of 200,000 gpd of secondary wastewater (0.8 MGD total). Secondary flow from one of nineteen MMSD clarifiers was diverted to the cloth filter system via a self-priming pump, treated, then discharged into the clarifier's effluent channel. The entire system was powered by a 3 hp pneumatic compressor, which along with...

...simple pneumatically operated open/close valves, are the only mechanical moving components in the system. Forward and reverse backwash flow are generated using available gravity head.



OPERATION: Filtration and backwash efficiencies were tested in 2006 and again in 2007. During the 18 month test period, flow from the secondary clarifier was pumped to the filter during all phases of filtration and backwash. The filtered effluent that collected in the cloth filter's main element bay provided adequate hydraulic head to clean the cloth media during backwash operations. An air scour system was added in spring of 2007 to supplement the previous water only backwash and increase cleaning efficiency. The added agitation from the air scour helps loosen TSS particles from the cloth fabric which are then carried away with the backwash water flow. Testing in 2007 showed marked improvement in backwash water generation, with cycle time and program changes further improving backwash efficiency. Backwash dropped to as low as 3% of forward flow during the fall of 2007. (Continue to Page 2)

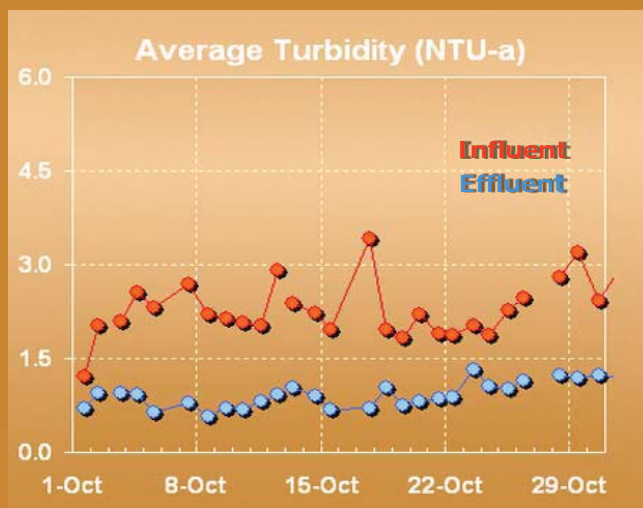
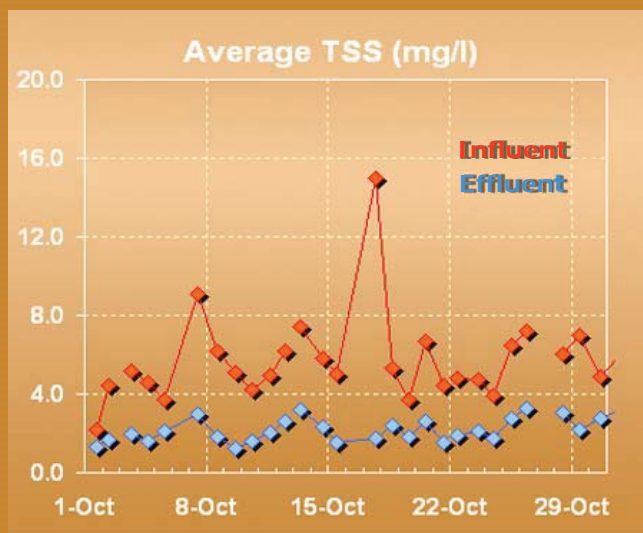


Air Scour Air Reservoir Added Spring 2007

FIXED MEDIA ELEMENTS:

2

MFC's tertiary cloth media system includes media panels that are sandwiched & supported within a 100% stainless steel framework that makes up each element. MFC fixed cloth media elements are rectangular in shape and remain stationary during ALL filtration and backwash operations. This design eliminates suction pumps, spray systems, chain drives, and other mechanical wear items. This lack of mechanical movement resulted in the media exhibiting excellent resilience to wear over the test period. Usable surface area for each element was 45 ft², resulting in 180 ft² of cloth area for the test filter. Hydraulic loading during the testing was ~3.33 gpm/ft² on a continuous basis.

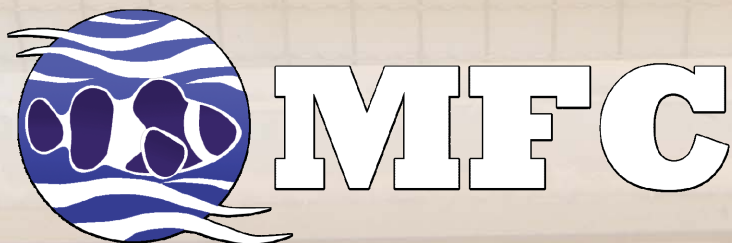


Operating Data from October 2007

DATA: The cloth filter produced re-use quality effluent throughout the entire test period. Effluent TSS was consistently below 4 mg/l with several grab samples below detection limits (<1.1 mg/l). Effluent Turbidity, measured as NTU, was consistently below 1.5 NTU, with numerous daily grab samples well below 1 NTU. (See data for Oct '07).

SUMMARY:

Flow:	405 gpm(.6 MGD) w/3 600 gpm(.8 MGD) w/4
Load:	Up to 3.33 gpm/ft ² (continuous)
TSS:	Influent = 4-16 mg/l Effluent = 1.1-4 mg/l
NTU:	Influent = 1.5-6 NTU Effluent = 1-1.6 NTU
Power Usage:	3Hp Compressor running intermittently = \$0.80/day(Filter Only)
Back-wash:	4-5% of forward flow, as low as 3%



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