

USING THE “FUZZY” FILTER TO PRODUCE TITLE 22 RECYCLED WATER

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ABSTRACT - As water reuse becomes more prevalent in California and other arid regions, the need for cost-effective and simple-to-operate filtration processes to meet the State of California Title 22 effluent quality requirements is increasingly important. One such filtration process, called the “fuzzy” filter, has been available for several years. However, because it is classified as an “alternative” tertiary effluent filtration process by the California Department of Health Services, the “fuzzy” filter has only been used in one project in California - the Town of Yountville located in the Napa Valley wine country.

The “fuzzy” filter uses a compressible media consisting of sponge-like balls that are contained between two perforated baffle plates, one fixed and one moveable. By lowering the moveable plate, the fuzzy media is compressed and the porosity of the filtration bed can be controlled. Tests performed on activated sludge effluent at the University of California, Davis demonstrated that tertiary filtered effluent (2 NTU or less) could be produced with filtration rates up to 20 gpm/sf and compression ratios from 10-30 percent.

In 1998 the Town of Yountville installed a “fuzzy” filter at its Wastewater Treatment Plant. The plant is somewhat unusual as it consists of a two-stage trickling filter plant (with intermediate clarification) followed by a solids contact process with final clarification as the secondary treatment process. The secondary effluent BOD and TSS typically average 10 - 15 mg/L and the effluent turbidity ranges from 3- 10 NTU.

Early results of the “fuzzy” filter operation were extremely promising with effluent turbidity less than 2 NTU for 80 percent of the time at a filtration rate of 15 gpm/sf and without chemical addition. Near the end of the irrigation period in October, however, the secondary effluent turbidity increased to 6 - 8 NTU and the filtered effluent quality deteriorated to 3 - 6 NTU. The reason for this drop off in performance was not determined.

During the second summer of operation, secondary effluent turbidities ranged from 4 - 10 NTU, but the effluent quality continued to exceed the Title 22 requirement of 2 NTU (i.e. 2 - 6 NTU). The performance drop off is currently under investigation. At present, it is hypothesized that the nature of the solid particles in the effluent from the lightly loaded TF-SC plant are fundamentally different than particles in the activated sludge effluent used in the UC Davis tests. More importantly, the TF-SC particles may not be as “filterable” as activated sludge solids.

The results of the further testing currently being performed by the manufacturer, the Town and its engineers to return the performance of the “fuzzy” filter to its initial levels will be reported in this paper. If the testing is successful, a new cost effective filtration process will be available for certification by the DOHS for use in producing tertiary filtered effluent for landscape irrigation and other high quality uses.

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