

**CITY OF LOS ANGELES**  
**INTER-DEPARTMENTAL CORRESPONDENCE**

**Date:** April 17, 2001

**To:** Omar Moghaddam, Manager  
Applied Research and Energy Management / WESD

**From:** Rosann Paracuelles / <sup>RF</sup> Seung Oh / Reza Iranpour, WESD Applied Research Group

**Subject:** Tillman Tertiary Filter Optimization Protocols: Particle Counter vs. Turbidimeter

***Introduction***

The Applied Research Group has been asked to evaluate the performance of the Phase I Filters at DC Tillman. The scope of the project consists of two phases. The first phase will be conducted using no chemical dosages. In the second phase, prechlorination and polymer addition will be used to assess the effect it might have on the filter process. Jar testing will be performed to find the optimal chemical dosages and contact time. The project will run for approximately two months.

***Experimental Setup***

Four MetOne PCX Particle Counters will be used for this experiment. The particle counters will be placed at the locations as shown in **Figure 1**. Sample waste streams from the secondary effluent main channel and from two of the filter effluent channels will be diverted to the particle counters. A flow schematic is shown in **Figure 2**. The sample will flow through a 750 $\mu$ m by 750 $\mu$ m optical flow cell. Each particle passing through the sensor will generate a signal that corresponds to its size. A flow rate of 100ml/min will be maintained with a water weir flow controller. All four counters will be connected to a system computer with data collection software that will record all the readings. The program will be set to take a reading every 15 minutes and to classify the particles into six size ranges.

Turbidity data will also be taken simultaneously. **We will be comparing data obtained from the particle counters with that of turbidimeters.** Furthermore, samples will also be taken once a week and analyzed by the Lab so that various water quality parameters (i.e. TSS, BOD, etc.) can be examined to evaluate their effect on filter performance.

### ***Conclusion***

In order to proceed with this project, we are enclosing a protocol for your review and comments. We are planning to start the experiment in the second week of May. We would appreciate any comments on this matter before April 25, 2001.

If you have any questions regarding this project, please contact Rosann Paracuelles at (310) 648-5763 or Seung Oh at (310) 648-5094. Thank you for your cooperation.

### **Attachments**

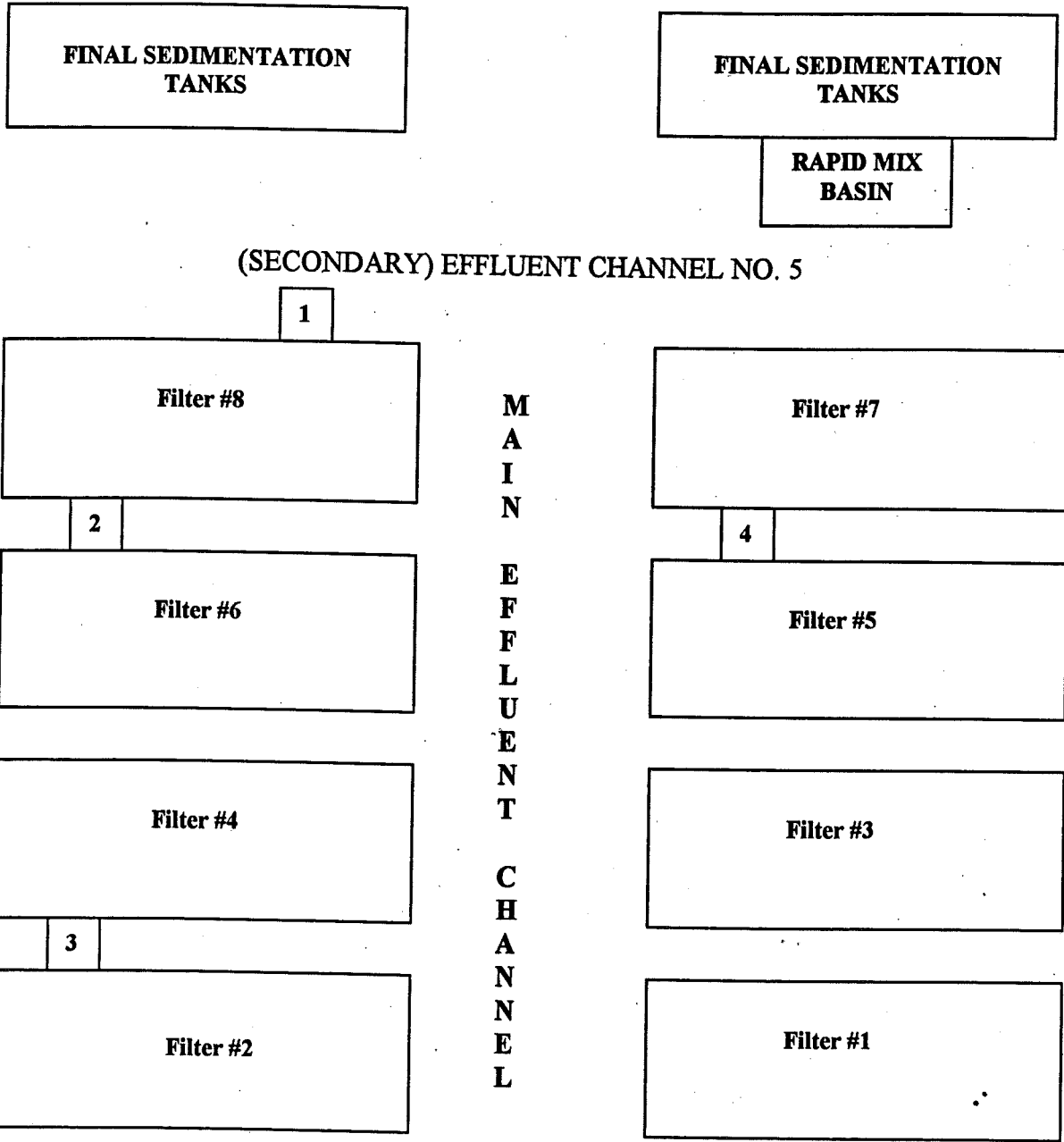
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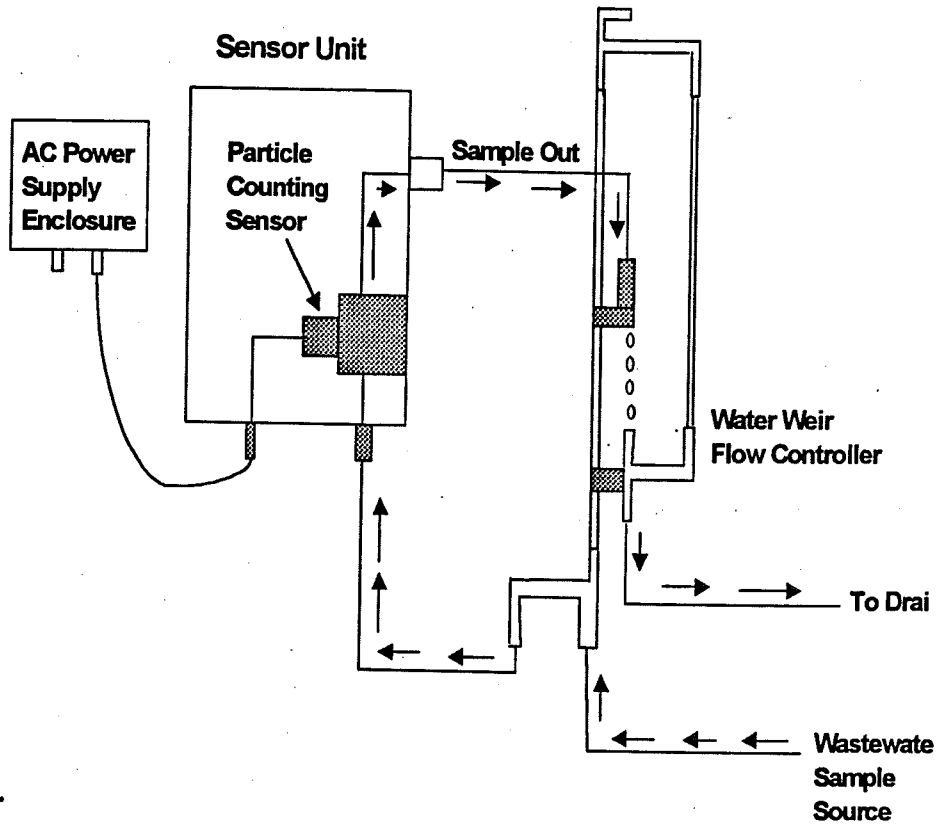
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**Figure 1. Locations of Particle Counters**  
(Note: Schematic Only – Not Drawn to Scale)



**Figure 2. Schematic Drawing of MetOne Particle Counter**



## Protocol for Particle Counter Project - DC Tillman

### Phase I : Week 1 - Week 4 : Evaluate Performance of Filters w/o Chemical Dosage

Location No.	Description	Frequency		
		Particle Counter	Turbidity Readings	Analyze Water Sample <sup>1</sup>
1	Filter Influent Channel (Secondary Effluent)	every 15 min.	every 15 min.	once a week
2	Effluent Channel Between 8 & 6	every 15 min.	every 15 min.	once a week
3	Effluent Channel Between 4 & 2	every 15 min.	every 15 min.	once a week
4	Effluent Channel Between 7 & 5 <sup>2</sup>	every 15 min.	every 15 min.	once a week

### Phase II : Week 5 - Week 8 : Evaluate Performance of Filters with Different Chemical Dosages (Chlorine and Polymer)

Location No.	Description	Frequency		
		Particle Counter	Turbidity Readings	Analyze Water Sample <sup>1</sup>
1	Filter Influent Channel (Secondary Effluent)	every 15 min.	every 15 min.	once a week
2	Effluent Channel Between 8 & 6	every 15 min.	every 15 min.	once a week
3	Effluent Channel Between 4 & 2	every 15 min.	every 15 min.	once a week
4	Effluent Channel Between 7 & 5 <sup>2</sup>	every 15 min.	every 15 min.	once a week

<sup>1</sup>For the duration of the project, a sample of the secondary effluent will be analyzed for the following parameters:

TSS  
BOD

<sup>2</sup>In order to evaluate the effectiveness of the dual media filter, Filter # 5 may be taken out of service since 7 & 5 share a common effluent channel.