

UNIVERSITI TEKNOLOGI MARA

A STUDY ON CARRY OVER FLOCS IN
SEDIMENTATION PROCESS AT CONVENTIONAL
WATER TREATMENT PLANT

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ABSTRACT

The crucial and critically of water treatment operator is in fulfill the demand of consumer is either from public or from industries as well as to maintain the quality of treated water supply as compliance to the water regulator. Typical problems facing by the water treatment plant management that can contribute to the low production and threat to the treated water quality is related to the coagulation and flocculation process, sedimentation system and filtration process. One of the common problems faced by conventional water treatment plant is the incident of carry over flocs during the sedimentation process. Thus, the main research is focus to study the root cause of the carry over flocs incident at conventional water treatment plant as well as the implications to the water treatment operation. Moreover, the research is also to evaluate the effectiveness of tube settler as secondary clarifier to reduce the occurrence of carry over floe. Carry over flocs occur whenever the flocs formed from the coagulation and flocculation process is not settled down during the settlement or clarification process. Many causes is contributed to the carry over cases either through the coagulation - flocculation efficiency factors, sedimentation design which is unable to optimize of settlement process and the cause of rapid growth demand of treated water production. Implication of uncontrolled carry over flocs will led to shorten filter runs due to the increased solids loading and consequence to water loss due to frequent of backwashing. Methodology used in this study is defined the root cause of carry over flocs by using cause effect analysis (Fish Bone Diagram). A conventional water treatment plant was selected as a case study for this research. The improvement has been made through the root cause identified and further the comparison of efficiency results has evaluated. From the case study, the main root because of carry over flocs happen at the selected water treatment due to the design problem. The proposal of clarifier aid which is tube settler application at settled water is expected to reduce the carry over flocs incident. The application of tube settler also increase the filter running hour into optimum design and thus reduce wash water consumption as well as influence to the decreasing of overall water losses. The successful of reducing carry over flocs has also contributed to the cost saving for water treatment plant through the increasing of treated water production.

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