A STUDY OF SLUDGE PRODUCTION AND COMPOSITION FROM WATER TREATMENT PLANTS IN PENANG

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ABSTRACT

A study of sludge based on alum coagulant was carried out at the sedimentation tanks of water treatment plants in Penang which was supervised by Perbadanan Bekalan Air Pulau Pinang Sdn Bhd (PBAPP). Sludge is a settleable solids or dewatered solids and consists of clay, inert materials, microorganisms and chemicals generated from the use of coagulation material. The objectives of the study are to estimate the quantity of sludge produced, to identify the characteristics of raw water and sludge, and to identify the composition of elements in the sludge with the possibility of using it as a useful material in the future. In order to meet these objectives, several tests were conducted on raw water samples and sludges. These include test on pH, turbidity, total suspended solids, moisture content, specific gravity and composition of elements in the sludge. The production of sludge from nine studied treatment plants in Penang was in the range of 5,450.19 kg/d to 1629335.84 kg/d and 5,252.67 kg/d to 1,514266.3 kg/d as observed by using Equation 2.9 and 2.10. Sungai Dua Water Treatment Plant had the highest amount of sludge production and the lowest sludge production was at Bukit Mertajam Water Treatment Plant. The result from this study indicates that raw water quality and weather condition significantly influenced the production of sludge. The study also indicates that the main elements of sludges are silica, aluminum, iron and potassium. The similarity of these substances with other construction materials will enable the possibility of sludge to be used as a construction material in the future.

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