

Application of Geotube® Method for Sludge Handling in Adaro Coal Mine

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Abstract : Adaro coal mine in South Kalimantan-Indonesia maintains catchment area of approximately 15,000 Ha for its mine operation. As an open pit surface coal mine with high erosion rate, the mine water in Adaro coal mine contains high TSS that needs to be treated before being released to rivers. For the treatment process, Adaro operates 21 Settling Ponds equipped with combination of physical and chemical system to separate solids and water to ensure the discharged water complied with regional environmental quality standards. However, the sludge created from the sedimentation process reduces the settling ponds capacity gradually. Therefore regular maintenance activities are required to recover and maintain the ponds' capacity. Trucking system and direct dredging had been the most common method to handle sludge in Adaro. But the main problem in applying these two methods is excessive area required for drying pond construction. To solve this problem, Adaro implements an alternative method called Geotube®. The principle of Geotube® method is the sludge contained in the Settling Ponds is pumped into Geotube® containers which have been designed to release water and retain mud flocks. During the pumping process, an amount of flocculants chemicals are injected into the sludge to form bigger mud flocks. Due to the difference in particle size, the mud flocks are settled in the container whilst the water continues to flow out through the container's pores. Compared to the trucking system and direct dredging method, this method provides three advantages: space required to operate, increasing of overburden waste dump volume, and increasing of water treatment process speed and quality. Based on the evaluation result, Geotube® method only needs 1:8 of space required by the other methods. From the geotechnical assessment result conducted by Adaro, the potential loss of waste dump volume capacity prior to implementation of the Geotube® method was 26.7%. The water treatment process of TSS in well maintained ponds is 16% more optimum.

Keywords : geotube, mine water, settling pond, sludge handling, wastewater treatment

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