

Mud Flow Diversion Management in The Porong River, Indonesia

Neil Andika and Pierre Y. Julien

Department of Civil and Environmental Engineering, Colorado State University

Abstract. Sidoarjo mud flow is a disaster that started on May 29, 2006 at drilling point of Lapindo Brantas Inc. at Sidoarjo, East Java, Indonesia. The mud has a sediment concentration of 70% and can be categorized as hyperconcentration flow and non-Newtonian fluid with cohesion and high yield strength. The mud flow itself is predicted have a 50% chance for lasting less than 41 years (Rudolph et al., 2011) with average discharge of 50,000 m³/d (Harnanto, 2011). Until March 22, 2007, the impacted area of Sidoarjo mud flow, determined by the National Mudflow Disaster Management Team was 650 ha. To mitigate the damage to surrounding regions, the Government of Indonesia took an action to discharge the mud to Madura Strait through Porong River (Hadimuljono, 2012). The diversion of mud to Madura Strait utilize the stream power of Porong River which has a high discharge in wet season. Porong River is a tributary of Brantas River. It starts and is controlled by Lengkong Baru River at Mojokerto to Madura Strait for about 51 km. Based on data from 1977 – 2007, average monthly discharge through Porong River is at least 100 m³/s at wet season and 0 m³/s at dry season (Harnanto, 2011). The purposes of this research are to determine the optimal sediment concentration at Porong River to maximize the sediment transport capacity of the Porong River, considering the characteristics of the mud as non-Newtonian fluid, yield strength, fall velocity and discharges in Porong River; and propose storage management strategies to mitigate the mud accumulation problems.