

Chairman's Lecture No. 18

Slope Failures Associated with Water Tank and Reservoir Sites – Some Case Studies in the Kuching Area, Sarawak

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Mr. Tan Boon Kong presented the 18th Chairman's Lecture on the 9th January 2013. His lecture was an extension of the talk presented at the GSM National Geoscience Conference 2012 at Kuching. The lecture was attended by more than 10 practising geologists and engineers.

Abstract: Water tanks and reservoirs are sited on top of hills and in hilly terrains. As such, slope failures can and are often encountered associated with these sites. This paper presents case studies on slope failures associated with five water tank and reservoir sites in the Kuching and vicinity areas. The engineering geologic studies cover: site geology, soil profile, soil/rock materials involved in the slope failures, causes of failures, and risk classification. The results of the studies are summarised in Table 1 below. Slope failures involved the weaker surficial soils such as fill materials and Old Alluvium, and in two cases, the residual soils as well. Rainfall/water infiltration into the slope is a common causative or triggering factor. Steeper slopes have higher slope failure risk as compared to gentler slopes. The plotting of isopach maps showing the thickness of the fill materials and Old Alluvium at the various water tank and reservoir sites is particularly useful in depicting and assessing potential slope failures.

Table 1: Slope Failures Associated with 5 Water Tank and Reservoir Sites.

Location	Fill/Alluvium	Residual Soil	Bedrock	Slope Failure
Pending	Old Alluvium, 2-9m sand, pebbles, cobbles	clayey silt 6-24m	Tuang Fm dark grey-black phyllite	Flow slide involving Old Alluvium
Datu Muda	Fill (clayey silt & silty sand), 2-8m	silty sand, gravels 1-12m	Tuang Fm Light grey metagraywacke	Slide remedied fill/residual soils
9 3/4 Mile	Fill (clayey silt) 2-8m	clayey silt 1-5m	Microtonalite	Failure involved fill and residual soils
Matang	Fill (cobbles, boulders, sand) 1-9m	clayey silt 5-20m	Pedawan Fm sandstone/shale	Failure involved fill materials dumped into a natural valley
Muara Tuang	Tipped fill 2.7-7.1m	clayey silt - silty clay 2-8m	Tuang Fm dark grey phyllite	Failure involved fill materials dumped into a natural valley

