

ABSTRACT

PT. Harmak Indonesia is located in the Sub-district Kokap, District Kulomprogo, Special Region of Yogyakarta. One of the running site is located in Quarry 2. The selected mining system for Nickel excavation is surface mining with Quarry method.

Surface mining is likely affected by local weather condition, particularly rainfall. When the extreme weather condition occurs, such as heavy rainfall, the runoff can potentially flood the mining area and flow into the ramp, as well to the lower area nearby. Therefore, it is necessary to make an adequate design for mine drainage system which suits the mining condition, so that the mining operations can be run properly. The planning drainage system design is a combination of mine drainage system and mine dewatering system. The purpose of this research was to create dimension, shape and location of open channels and settling pond.

Based on the analysis of rainfall data from 2008 – 2017, the researcher is able to calculate the scheduled precipitation value by 98,37 mm/day. The intensity of rainfall has been calculated into 34,10 mm/hour during 2-years rainfall period and the percentage of hydrological risk is 98,2%. Catchment area of the research are divided into two catchments (DTH) as follows : DTH I = 0,0784 km², DTH II = 0,0510 km², DTH III = 0,0176 km² and DTH IV = 0,0150 km². The calculation of discharge runoff in each catchment areas are presented as follows : DTH I = 0,44 m³/sec, DTH II = 0,33 m³/sec, DTH III = 0,11 m³/sec and DTH IV = 0,08 m³/sec . In order to restrain rainwater from entering the mining area and canalize the runoff to settling pond, it is necessary to develop open channels all around the perimeter mine site. There are 3 open channels with the same dimensions: $b = 2,17\text{ m}$; $B = 1,09\text{ m}$; $d = 1,14\text{ m}$; $h = 0,95\text{ m}$; $a = 1,31\text{ m}$, angle; 60°

The canalized runoff from the open channel must be treated in the settling pond first before being discharged into river. Settling pond design consists of three spaces of compartments. The area of each compartment is 344 m² with the total volume of 3.114 m³. The settling pond maintenance should be done periodically every 7 months.