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Abstract Index

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Geotechnical Study for Analyzing Slope Stability Between Two Mining Pit Baundary

Studi Geoteknik untuk Menganalisis Stabilitas Antara Dua Batas Pit Penambangan

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P. 1-11

This paper is a new concept to increase the safety and mining conservation on PT-X and PT-Y with no boundary gap between the two areas. To optimize coal recovery as a basis of supporting conservation, the two companies needed to adjust coal production in terms of avoiding technical problems at the mining time process due to the rock structure and coal seam at the border were the same. PT-X plans to produce 2 million tons of coal, but the government only approved 1 million tons, while PT-Y still approved 2 million tons. This paper discusses the instability of mining in border locations due to the differences of coal production. The applied methodology is conducting geotechnical modeling by considering statistical aspects of data distribution and the probability of failure. Based on the results of geotechnical modeling by numerical methods on the basis of 2D and 3D for the difference in the production level of 1 million tons in all cross-sections, the FK value is 0.992 - 1.248 with a probability of failure (PI) of 5.40 - 48.00%. Results of modeling analysis show that both single and overall slopes are at a critical level and are not safe. If this difference is narrowed by increasing PT-X's coal production by 1.5 million tons, the border location's mining conditions will stabilize. Therefore, it is necessary to propose to the government for PT-X's coal production to be added by at least 500.000 tons so that the production process of each company runs safely.

Keywords: production, pit boundary, slope stability, numerical modeling

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Overview on an Open Pit Mine Planning of the Pickstone Peerless in a Volatile Environment

Tinjauan Perhitungan Penjadwalan Perencanaan Tambang Terbuka* Pickstone Peerless *pada Lingkungan dengan Volatilitas Tinggi

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P. 13-27

The prevailing mining climate is highly characterized by unstable consumables pricing systems, a volatile economy and skyrocketing operational costs, and exacerbated by a steady decline and intermittence in the availability of electricity. Zimbabwean mines need to extensively capitalize on the opportunity to improve productivity by emphasizing variables they can control, predominantly operational efficiency to avoid resizing of operations or facilitating downsizing by relatively insignificant factors. In this study, cycle times, rig penetration, utilization, availability and payloads were used to evaluate the mining cycles, operator costs and the information was compared against the life of mine plans with block models. Shifts were restructured to be concordant to the schedule provided by the utility company to save fuel that was being used to power metallurgical plant. Several challenges have been identified as the principal reasons behind discrepancies between the theoretical capabilities of equipment were proven to be achievable by a trial schedule which reduced the 7 days/month to less than 2 days a month. The new schedule reflects a theoretical improvement of close to 25% and significantly lower operational costs. The current mining fleet is capable of meeting the stipulated targets and even achieving more even within tough working environments characterized by harsh load shedding schedules and volatile inflation rates; however, this requires stringent monitoring and evaluation of unit process. By adopting the recommended short term production plans will avoid resizing of operations as it automatically reduces the operational costs by US $3 million annually whilst coercing both operators and management to improve their operational efficiency.

Keywords: availability, environment, mining, scheduling, volatile

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Impact of Illegal Gold Mining in Jambi, Indonesia

Dampak Penambangan Emas Ilegal di Jambi, Indonesia

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P. 29-40

Illegal gold mining caused various environmental damages in the world. Indonesia is one of the countries with abundant mineral reserves, especially Jambi Province. Jambi has much of natural resources, such as coal and gold. Unfortunately, the management of these natural resources has not been appropriately managed, which has resulted in much illegal gold mining. Illegal mining activities have caused environmental damage, mainly decreased water quality and changed landscapes. This paper explains the illegal mining activities at Jambi Province, including its history, socio-economic and environmental impacts, as well as recent technologies to reduce the environmental damage. Quantitative and qualitative methods were used in this research, including interviews, questionnaires, and laboratory measurements. The results showed that the people of Sarolangun, Bungo, and Tebo were aware that their illegal gold mining activities caused environmental damage. However, economic conditions and insufficient employment opportunities made unlawful gold miners have no other choice. Illegal gold mining

gold miners have no other choice. Illegal gold mining activities have also shifted people's livelihoods who previously worked as farmers.

Keywords: illegal mining, social-economy impact, environmental impact

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Putri, Ezra B. R.; Zahar, Wahyudi and Marlinda, Lenny (University of Jambi)
Effect of Vacuum Residue and Petroleum Benzine as the Additive Calorific Value and Moisture of Coal
Pengaruh* Vacuum Residue *dan* Petroleum Benzine *sebagai Zat Aditif pada Kadar Air dan Nilai Kalor Batubara
IMJ, Vol. 25, No. 1, April 2022,
P. 41-47

Upgrading the coal is a process that increases the calorific value of low-rank coal through decreasing the moisture content of the coal. This method usually uses mixed heavy oil to close the opened pores after coal upgrading. The additives have a molecule structure like heavy oil. The aim of this study is to determine the effect of additives on the moisture content and calorific value after coal upgrading process. Coal upgrading in this study applies several variations i.e., coal particle size and coal mass mixed with an additive which is a mixture of vacuum residue and petroleum benzine with a ratio of 0.005 g: 1 mL as a coater. Before upgrading process, the moisture content and calorific value of the coal is 13.39 %adb and 6,663 cal/g db. After the process, the lowest moisture content of the coal in the ratio of coal (b/v) and additives was 4:3 with 21.75% ad. The highest calorific value of the coal was shown in the ratio of coal (b/v) and additives 1:1 with 7,189 kcal/kg. The lowest moisture content is indicated by the particle size of -120 mesh. The highest calorific value of coal is shown by the particle size of -120 mesh.

Keywords: coal upgrading, additives, coal, moisture content, calorific value

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Wulansari, Restu; Maryono; Darmawan, Didit A.; Athallah, Faris N. F. and Hakim, Fardian K. (Research Institute for Tea and Chincona; Center for Mineral and Coal Testing; Padjadjaran University)
Bio-organo Mineral Effect on Soil Fertility, Nutrient Uptake, and Sweet Corn (*Zea mays L. saccharata*) Growth Planted in Inceptisols Soils
***Pengaruh Pupuk Bio-organomineral terhadap Kesuburan Tanah, Serapan Hara, dan Pertumbuhan Tanaman Jangung Manis (*Zea mays L. saccharata*) pada Tanah* Incepticols**
IMJ, Vol. 25, No. 1, April 2022,
P. 49-58

Sweet corn (*Zea mays L. saccharata*) is a horticultural product widely consumed by Indonesian people because of its sweetness. Corn requires sufficient nutrients to grow and produce the optimal yield so that the fertilization is a determining factor in corn cultivation. Bio-organomineral fertilizer (BIOM) is a fertilizer that combines mineral, organic, and biological elements (microorganisms). This study aims to examine the effect of BIOM on growth of sweet corn, nutrient uptake, and soil fertility. Experimental design used in this research was Randomized Block Design (RBD) with nine treatments and three replications which consist of treatments control; 1 NPK; ½ BIOM; 1 BIOM; 1 NPK + ½ BIOM; 1 NPK + ¾BIOM; 1 NPK + 1 BIOM; ¾NPK + 1¼BIOM; and ¾NPK + 1½BIOM. Effect of BIOM fertilizer at 100% dosage significantly increased the plant height, stem diameter, and canopy diameter compared to the control. BIOM fertilizer had a significant effect on the N uptake, total N, P-potential, P-available, K-potential, and K- exchangeable. The fertilizer is able to provide positive results on the growth of sweet corn, so it's more effective for the availability of nutrients needed by sweet corn plants.

Keywords: bio-organomineral, nutrient uptake, soil fertility, sweet corn