RINGKASAN

Optimalisasi pit merupakah salah satu kegiatan yang sangat diperlukan sebelum kegiatan penambangan dilakukan guna memaksimalkan keuntungan dan meminimalkan risiko. Penelitian dilaksanakan di PT Indominco Mandiri yang berlokasikan di Provinsi Kalimantan Timur. Penelitian ini didasari dari kebutuhan adanya studi optimalisasi batas akhir penambangan pada wilayah PIT 24. Pada penelitian ini dilakukan optimalisasi dengan menggunakan algoritma pseudoflow yang berkerja berdasarkan dari konsep aliran maksimum dan pemotongan blokir maksimum agar mendapatkan desain batas akhir penambangan yang optimal. Tujuan penelitian ini yaitu melakukan optimalisasi sehingga didapatkan rancangan desain batas akhir penambangan serta tingkat ketahanan desaian terhadap perubahan harga komoditas. Pengolahan data dibantu menggunakan perangkat lunak Deswik.CAD 2023.2.

Diperlukannya beberapa persiapan data sebelum dilakukan proses optimalisasi, seperti tahapan *setup* yang meliputi pemberian atribut umum dan biaya pada masing-masing blok dengan mengikuti kaidah konsep *block economical value*. Selanjutnya dilakukan proses optimalisasi yang dilakukan berdasarkan dari beberapa parameter meliputi keekonomisan dan keteknisan seperti harga penjualan batubara, biaya operasional dan rekomendasi geoteknik.

Optimalisasi dilakukan berdasarkan 13 variasi *revenue factor* sehingga menghasilkan 13 variasi *pit shell* pula. Selanjutnya dilakukan analisis penentuan *pit shell* optimum berdasarkan volatilitas harga batubara yang mana nantinya akan digunakan untuk perhitungan besaran *undiscounted profit* dari masing-masing tiap *pit shell*. *Pit shell* yang paling optimum akan dipilih berdasarkan nilai *profit* yang paling besar yaitu *Pit Shell* 05 yang dihasilkan dari variasi *revenue factor* 0,9 dengan *undiscounted profit* sebesar US$17.715.514. Penelitian ini didukung dengan analisis risiko terhadap toleransi penurunan harga komoditas yang didapatkan sebesar 19,9% terhadap desain batas akhir penambangan. Selanjutnya, dilakukan desain operasional berdasarkan dari *pit shell* yang paling optimum dengan geometri jenjang tunggal 8 meter, lebar jenjang 4 meter, dan kemiringan 70°. Berdasarkan dari desain operasional didapatkan kenaikan profit sebesar 2,5% dari hasil optimalisasi menjadi US$18.175.242. Rancangan juga dilengkapi dengan area timbunan yang didapatkan kapasitas sebesar 7.901.495 CCM dan jalan angkut tambang.

SUMMARY

Pit optimization is one of the most critical activities required before mining activities are initiated to maximize profit and minimize risk. This research was conducted at PT Indominco Mandiri, which is located in East Kalimantan Province. This research is based on the need for an optimization study of the final mining limit in the PIT 24 area. In this research, the optimization was used pseudoflow algorithm that works based on the concept of maximum flow and maximum block cutting to obtain the most optimal final mining limit design. The purpose of this research is to optimise the design of the final mining limit and the level of sustainability of the design against changes in commodity prices. Data processing was processed using Deswik.CAD 2023.2 software.

Some data preparation is required before the optimization process is carried out, such as the setup stage which includes giving general attributes and costs to each block by following the rules of the block economic value concept. Furthermore, the optimization process is carried out based on several parameters including economics and engineering such as coal sales prices, operational costs, and geotechnical recommendations.

Optimization was executed based on 13 revenue factor variations, resulting in 13 pit shell Variations as well. Furthermore, the optimum pit shell determination is analysed based on coal price volatility which will be used to calculate the amount of undiscounted profit from each pit Shell. The most optimum pit shell will be selected based on the highest profit value, namely Pit Shell 05, which is generated from a variation of revenue factor 0.9 with an undiscounted profit of US$17,715,514. This is supported by a risk analysis of the tolerance of commodity price declines, which was found to be 19.9% of the final mining limit design. Next, an operational design was carried out based on the most optimum pit shell with a single level geometry of 8 meters, a level width of 4 Metres, and a slope of 70°. Based on the operational design, a 2.5% increase in profit was obtained from the optimization results in US$18,175,242. The design also includes a stockpile area with a capacity of 7,901,495 CCM and a mine haul road.