

ABSTRAK

REKOMENDASI KESTABILAN LERENG PIT X DAERAH TANJUNG ENIM, KABUPATEN MUARA ENIM, SUMATRA SELATAN

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Penambangan batubara dengan metode tambang terbuka memiliki potensi risiko ketidakstabilan lereng yang berdampak pada keselamatan kerja dan keberlangsungan operasional tambang. Penelitian di Pit X, Tanjung Enim, Kabupaten Muara Enim, Sumatra Selatan bertujuan menilai kondisi geologi, menganalisis kestabilan lereng desain tahunan, dan memberikan rekomendasi desain lereng yang aman serta efisien. Metode meliputi pengamatan litologi, struktur geologi, bidang diskontinuitas, dan data sekunder perusahaan, dengan analisis kestabilan menggunakan metode *Limit Equilibrium* (LEM) pendekatan Morgenstern-Price serta penentuan parameter massa batuan melalui kriteria *Generalized Hoek-Brown* dan *Mohr-Coulomb*. Hasil menunjukkan litologi penyusun berupa batupasir, batulempung, batubara, dan batulanau yang dipengaruhi oleh bidang diskontinuitas, seperti kekar. Nilai RMR dan GSI masing-masing sebesar 63 dan 58 untuk *overburden* A1, 64 dan 59 untuk *interburden* A1-A2, 61 dan 56 untuk *interburden* A2-B1, 60 dan 55 untuk *interburden* B1-B2, serta 64 dan 59 untuk *interburden* B2-C. dengan nilai faktor keamanan lereng yang berada di atas nilai minimum sehingga lereng dinyatakan stabil. Perhitungan volume dengan metode *cross section* menghasilkan *overburden* 903.457,3 m³ dan batubara 589.328,6 m³ dengan *stripping ratio* 1,53. Desain lereng usulan dinyatakan aman, meningkatkan efisiensi penambangan, serta dapat menjadi acuan perencanaan tambang terbuka pada kondisi serupa.

Kata kunci: batubara, kestabilan lereng, *Limit Equilibrium*, rekomendasi desain, *stripping ratio*

ABSTRACT

SLOPE STABILITY RECOMMENDATION OF PIT X, TANJUNG ENIM AREA, MUARA ENIM REGENCY, SOUTH SUMATRA

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Open-pit coal mining has the potential risk of slope instability, which may affect occupational safety and the continuity of mining operations. This study was conducted at Pit X, Tanjung Enim, Muara Enim Regency, South Sumatra Province, with the objectives of evaluating geological conditions, analyzing the stability of the annual slope design, and providing safe and efficient slope design recommendations. The methods included observations of lithology, geological structures, discontinuity planes, and the use of secondary data from the company. Slope stability analysis was performed using the Limit Equilibrium Method (LEM) with the Morgenstern–Price approach, while rock mass parameters were determined using the Generalized Hoek–Brown and Mohr–Coulomb criteria. The results indicate that the study area is composed of sandstone, claystone, coal, and siltstone, which are influenced by discontinuity planes such as joints. The RMR and GSI values are 63 and 58 for overburden A1, 64 and 59 for interburden A1–A2, 61 and 56 for interburden A2–B1, 60 and 55 for interburden B1–B2, and 64 and 59 for interburden B2–C. The factor of safety values are above the minimum required threshold, indicating that the slopes are stable. Volume calculations using the cross-section method resulted in 903,457.3 m³ of overburden and 589,328.6 m³ of coal, with a stripping ratio of 1.53. The proposed slope design is considered safe, improves mining efficiency, and can serve as a reference for open-pit mine planning under similar geological conditions.

Keywords: coal, design recommendation, Limit Equilibrium, slope stability, stripping ratio