

ABSTRAK

GEOLOGI DAN KUALITAS BATUBARA SEAM B2 DAERAH TANJUNG ENIM, MUARA ENIM, SUMATERA SELATAN

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Lokasi penelitian berada pada wilayah IUP PT Bukit Asam Tbk di Kecamatan Lawang Kidul, Kabupaten Muara Enim, Provinsi Sumatera Selatan. Secara geologi, daerah penelitian termasuk dalam Formasi Muara Enim berumur Miosen Tengah yang tersusun atas batulempung, batulempung karbonan, batulanau, batupasir, batupasir tufaan, dan batubara. Penelitian ini bertujuan untuk mengidentifikasi kondisi geologi bawah permukaan serta menganalisis kualitas batubara Seam B2 dan pengaruh lingkungan pengendapan terhadap kualitas batubara pada daerah penelitian. Metode yang digunakan meliputi metode deskriptif dan analitik melalui integrasi data pemboran, log geofisika, serta analisis laboratorium kualitas batubara. Berdasarkan hasil interpretasi, lingkungan pengendapan daerah penelitian termasuk ke dalam lingkungan *Transitional dan Lower Delta Plain* dengan asosiasi fasies berupa *swamp, levee, crevasse splay, dan channel*. Secara umum, kualitas batubara menunjukkan kecenderungan meningkat seiring bertambahnya umur stratigrafi, yang ditunjukkan oleh peningkatan nilai kalor dari Seam A1 sebesar 5.473,67 kcal/kg (adb) hingga Seam D sebesar 5.823,50 kcal/kg (adb). Namun demikian, Seam B2 menunjukkan karakteristik kualitas yang berbeda, dengan nilai kalor sebesar 5.576,33 kcal/kg (adb) yang lebih rendah dibandingkan Seam C sebesar 5.780,75 kcal/kg (adb) meskipun berada pada posisi stratigrafi yang lebih tua. Hasil pembobotan kualitas menunjukkan bahwa Seam B2 memiliki nilai rata-rata TM (ar) 32,43%, IM (adb) 16,76%, VM (adb) 37,14%, Ash (adb) 5,44%, FC (adb) 40,65%, TS (adb) 0,98%, dan CV (adb) 5.576,33 kcal/kg. Berdasarkan analisis kualitas batubara dan data geologi pendukung, faktor pengontrol utama kualitas Seam B2 berasal dari tingginya kandungan abu (Ash) dan total sulfur (TS). Tingginya kandungan sulfur didukung oleh keberadaan mineral pirit (FeS_2) yang menunjukkan kondisi lingkungan pengendapan yang bersifat reduktif dan adanya pengaruh suplai sulfat selama proses pembentukan gambut serta tingginya kadar abu berkaitan dengan keberadaan parting pada Seam B2 yang mengindikasikan adanya gangguan pengendapan gambut oleh material klastik halus, sehingga meningkatkan kandungan material anorganik. Berdasarkan klasifikasi ASTM D388 (2005), Seam B2 termasuk ke dalam peringkat Subbituminous A Coal dengan nilai kalor sebesar 10.783,52 Btu/lb (dmmf).

Kata kunci: batubara, kualitas, Muara Enim, lingkungan pengendapan, Seam B2.

ABSTRACT
GEOLOGY AND COAL QUALITY
OF THE B2 COAL SEAM IN THE TANJUNG ENIM AREA,
MUARA ENIM, SOUTH SUMATRA

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The study area is located within the Mining Business Permit (IUP) area of PT Bukit Asam Tbk, Lawang Kidul District, Muara Enim Regency, South Sumatra Province. Geologically, the study area belongs to the Middle Miocene Muara Enim Formation, which is composed of claystone, carbonaceous claystone, siltstone, sandstone, tuffaceous sandstone, and coal. This study aims to identify the subsurface geological conditions and analyze the coal quality of Seam B2 as well as the influence of the depositional environment on coal quality within the study area. The research employed descriptive and analytical methods through the integration of drilling data, geophysical logs, and laboratory coal quality analyses. Based on the interpretation results, the depositional environment of the study area is classified as a Transitional to Lower Delta Plain setting, characterized by facies associations consisting of swamp, levee, crevasse splay, and channel deposits. In general, coal quality shows an increasing trend with increasing stratigraphic age, as indicated by the rise in calorific value from Seam A1, with a value of 5,473.67 kcal/kg (adb), to Seam D, with a value of 5,823.50 kcal/kg (adb). However, Seam B2 exhibits a different quality characteristic, with a calorific value of 5,576.33 kcal/kg (adb), which is lower than that of Seam C at 5,780.75 kcal/kg (adb), despite its older stratigraphic position. The weighted average coal quality parameters of Seam B2 are 32.43% Total Moisture (TM, ar), 16.76% Inherent Moisture (IM, adb), 37.14% Volatile Matter (VM, adb), 5.44% Ash (adb), 40.65% Fixed Carbon (FC, adb), 0.98% Total Sulfur (TS, adb), and a Calorific Value (CV, adb) of 5,576.33 kcal/kg. Based on coal quality analysis and supporting geological data, the primary controlling factors affecting the quality of Seam B2 are its relatively high ash and total sulfur contents. The elevated sulfur content is associated with the occurrence of pyrite (FeS_2), indicating reducing depositional conditions and the influence of sulfate supply during peat formation. Meanwhile, the relatively high ash content is related to the presence of partings within Seam B2, which indicate disturbances in peat accumulation caused by the influx of fine-grained clastic materials, thereby increasing the proportion of inorganic matter within the coal. According to the ASTM D388 (2005) classification, Seam B2 is categorized as Subbituminous A Coal, with a calorific value of 10,783.52 Btu/lb (dmmf).

Keywords: Coal, Coal Quality, Muara Enim Formation, Depositional Environment, Seam B2.