

## SARI

### GEOLOGI DAN STUDI KARAKTERISTIK BATUGAMPING SEBAGAI BAHAN DASAR SEMEN BERDASARKAN ASPEK FISIK DAN KIMIA PADA KUARI XII DI PULAU NUSAKAMBANGAN

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Batugamping merupakan mineral industri yang berperan penting dalam pembuatan semen. Studi area prospek dan kualitas batugamping penting sebelum melakukan penambangan batugamping. Penelitian bertujuan mengetahui kondisi geologi, mengetahui karakteristik batugamping berdasarkan aspek fisik dan kimia, potensi dan kelayakan batugamping sebagai bahan dasar semen, dan hubungan karakteristik fisik dan kimia batugamping. Daerah penelitian berada di Pulau Nusakambangan, Kabupaten Cilacap, Provinsi Jawa Tengah. Secara stratigrafi daerah penelitian dari tua ke muda terdiri dari Satuan Breksi Gunungapi, Satuan Tuf, Satuan Batupasir, Satuan Batugamping, dan Satuan Endapan Aluvium. Studi karakteristik batugamping ini menggunakan analisis petrografi dan analisis *X-Ray Fluorescence*. Secara petrografi batugamping dari tua ke muda terdiri litofasies *packstone*, *grainstone* dan *crystalline*. Fasies *packstone*, *grainstone* termasuk kedalam zona fasies paparan karbonat tertutup dengan lingkungan pengendapan zona fasies *slope*. Fasies *crystalline* merupakan fasies yang tidak lagi memperlihatkan tekstur pengendapan asli. Fasies *crystalline* mencerminkan proses diagenesis yang terjadi pada batugamping di daerah penelitian. Kandungan CaO dan MgO pada batugamping sebagai parameter kelayakan memiliki nilai (CaO minimum 48%) dan nilai (MgO maksimum 1,8%). Analisis XRF dari 19 sampel batugamping berdasarkan kadar dolomit, pemerian nama termasuk pada batugamping. Setelah dilakukan pengamatan lebih lanjut terhadap unsur-unsur kimia yang terdapat pada batugamping daerah studi khusus, tidak ditemukan anomali distribusi unsur kimia pada seluruh sampel batugamping. Serta unsur-unsur lainnya seperti SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub> cenderung tidak berbeda jauh dengan batugamping disekitarnya. Berdasarkan sasaran mutu *quality raw material* dari kandungan kimia, hasil analisis XRF seluruh batugamping pada daerah penelitian memiliki kualitas baik (*high grade*) dan layak sebagai bahan dasar semen.

**Kata kunci:** *Batugamping, Kualitas, Petrografi, Semen, XRF.*

## ABSTRACT

### GEOLOGY AND STUDY OF CHARACTERISTICS LIMESTONE AS A CEMENT BASE MATERIAL BASED ON PHYSICAL AND CHEMICAL ASPECTS AT QUARRY XII ON NUSAKAMBANGAN ISLAND

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Limestone is an industrial mineral that plays an important role in the manufacture of cement. The study area of the prospects and the quality of the limestone critical before doing the mining limestone. The research aims to find out the condition of geology, knowing the characteristics of limestone based on physical and chemical aspects, the potential and the appropriateness of limestone as a raw material of cement, and the relationship of physical and chemical characteristics of limestone. The research area is on the island of Nusakambangan, Cilacap District, Central Java Province. In the regional stratigraphic research of the old to the young consisted of volcanic breccia unit, unit of tuff, sandstones unit, limestone unit, and unit deposits of alluvium. Study of the characteristics of petrographic analysis using limestone and X-Ray Fluorescence analysis. In petrographic limestone from young to old are composed grainstone litofacies, packstone, and crystalline. The packstone facies, grainstone including into the zone covered with carbonate exposure fasies environments of deposition zone fasies slope. The crystalline facies is no longer showing the original depositional texture. Crystalline Facies reflects the process of diagenesis that occurs on the limestone in the area of research. Content of CaO and MgO in limestone as the eligibility parameters have values (minimum 48%), CaO and values (1.8%) to a maximum of MgO. XRF analysis of 19 samples of limestone, dolomite levels based on her name included on the limestone. After further observations against the chemical elements found in the limestone area of study, it is not anomalous distribution of chemical elements found in all samples of limestone. As well as other elements such as SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub> tend not to differ greatly from the surrounding limestones. Based on the quality objectives of raw material of chemical content of XRF analysis, the results of the whole research area on limestone have good quality (high grade) and decent as the raw material of cement.

**Keywords:** *Cement, Limestone, Quality, Petrography, XRF.*