Pemodelan 3d dan estimasi sumber daya endapan laterit di lapangan "sy", Pulau Sebuku, Kotabaru, Kalimantan Selatan = 3d modelling and resource estimation of laterite deposit in "sy" field, Sebuku Island, Kotabaru, South Kalimantan

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Abstrak

Penelitian telah dilakukan di Lapangan "SY", Pulau Sebuku, Kotabaru, Kalimantan Selatan. Tujuan dari penelitian ini mengidentifikasi karakteristik laterit berdasarkan hasil domaining geologi dan mengestimasi sumber daya endapan laterit pada daerah penelitian. Data yang digunakan merupakan basis data hasil pengeboran meliputi collar, survey, dan geoassay. Metode pengolahan dan analisis data meliputi analisis statistik univarian dan bivarian serta metode estimasi ordinary kriging. Unsur yang diestimasi meliputi Ni dan unsur lain Co, SiO₂, dan MgO dengan variogram model yang digunakan yaitu Ni sebagai variabel utama. Karakteristik berdasarkan ciri fisiknya domain limonit tersusun atas limonit kuning dan limonit merah sedangkan domain saprolit tersusun earthy saprolit dan rocky saprolit. Domain limonit cenderung mengalami pengayaan secara bertahap unsur Fe dari permukaan hingga zona transisi bersamaan dengan kenaikan unsur Ni, SiO₂, dan MgO secara gradual hingga domain saprolit. Domain bedrock cenderung kaya akan unsur SiO₂ dan MgO. Unsur Co terkonsentrasi di zona transisi antara domain limonit dan saprolit. Diketahui hasil estimasi sumber daya Ni domain limonit berada pada rentang 0-2 % sedangkan domain saprolit 0-2.5 %. Klasifikasi sumber daya berdasarkan parameter geostatistik slope of regression dengan cut off grade Ni 1 % menunjukan daerah penelitian tersusun atas kelas tertunjuk dan terukur. Domain limonit menghasilkan volume 15,938 m³ dan tonase 38,091 ton dengan kandungan rata-rata Ni 1.123 % serta Co 0.126 %, Fe 44.405 %, SiO₂ 8.357 %, dan MgO 4.243 % kelas tertunjuk dan volume 605,313 m³ dan tonase 1,446,697 ton dengan kandungan rata-rata Ni 1.175 % serta Co 0.118 %, Fe 44.629 %, SiO₂ 8.334 %, dan MgO 3.928 % kelas terukur. Domain saprolit menghasilkan volume 5,469 m³ dan tonase 10,938 ton dengan kandungan rata-rata Ni 1.199 % serta Co 0.035 %, Fe 14.195 %, SiO₂ 33.865 %, dan MgO 26.979 % kelas tertunjuk dan volume 389,141 m³ dan tonase 773,125 ton dengan kandungan rata-rata Ni 1.22 % serta Co 0.034 %, Fe 14.535 %, SiO₂ 33.912 %, dan MgO 26.119 % kelas terukur.
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Research has been carried out in the "SY" field, Sebuku Island, Kotabaru, South Kalimantan. The purpose of this study is to identify the characteristics of laterite based on the results of geological domaining and estimating the resources of laterite deposits in the study area. The data used is the database of drilling results including collars, surveys and geoassay. Data processing and analysis methods include univariate and bivariate statistical analysis and ordinary kriging estimation methods. The estimated elements include Ni and other elements Co, SiO2, and MgO with the variogram model used is Ni as the main variable. Characteristics based on physical characteristics limonite domain is composed of yellow limonite and red limonite while the saprolite domain is composed of earthy saprolite and rocky saprolite. The limonite

domain tends to gradually enrichment of the Fe element from the surface to the transition zone together with the gradual increase of the Ni, SiO2, and MgO elements to the saprolite domain. The bedrock domain is rich of SiO2 and MgO elements. The Co element is concentrated in the transition zone between the limonite and saprolite domains. The result of resource estimation of Ni for limonite domain in the range of 0-2 % while the saprolite domain is 0-2.5 %. Classification of resources based on the slope of regression geostatistical parameters with a cut-off grade of Ni 1 % showed the study area is composed of indicated and measured classes. The limonite domain produces volume 15,938 m³ and tonnage of 38,091 tons with an average content of Ni 1.123 % and Co 0.126 %, Fe 44.405 %, SiO₂ 8.357 %, and MgO 4.243 % for indicated class and volume of 605,313 m³ and tonnage of 1,446,697 tons with an average content Ni 1.175 % and Co 0.118 %, Fe 44.629 %, SiO₂ 8.334 %, and MgO 3.928 % measured class. The saprolite domain produces a volume of 5,469 m³ and tonnage of 10,938 tons with an average content of Ni 1.199 % and Co 0.035 %, Fe 14.195 %, SiO₂ 33.865 %, and MgO 26.979 % indicated class and volume 389,141 m³ and tonnage 773,125 tons with an average content Ni 1.22 % and Co 0.034%, Fe 14.535 %, SiO₂ 33.912 %, and MgO 26.119 % measured class.