Pemodelan dan domain estimasi sumber daya emas pada Zona X kawasan pertambangan PT Nusa Halmahera Minerals = Modeling and resource estimation domain for gold in Zone X mining area of PT Nusa Halmahera Minerals

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Abstrak

Penelitian dilakukan pada kawasan Lapangan Penambangan Emas Gosowong yang merupakan zona endapan mineralisasi Au-Ag. Tujuan dari penelitian ini untuk memodelkan sebaran litologi, alterasi, dan urat serta menentukan dan memodelkan domain estimasi berdasarkan kontrol geologi pada mineralisasi emas. Metode analisis data menggunakan analisis statistik dan pemodelan implisit berbasis fungsi radial basis (RBF). Penelitian ini dilakukan menggunakan data bor berupa data collar, survey, assay, litologi, alterasi, dan persen kuarsa. Hasil yang didapat dari penelitian ini adalah pemodelan 3D dan domain estimasi sumber daya emas yang berada pada lokasi penelitian. Pada pemodelan litologi terdapat empat anggota formasi yaitu Basaltik Gosowong, Andesitik Gosowong, Kuarter, Penutup Terbaru. Pada pemodelan alterasi terdapat tiga zona alterasi yaitu argilik, propilitik, dan silikat. Alterasi silikat merupakan penanda area proksimal. Terdapat total 18 urat dengan orientasi dominan ke timur. Berdasarkan arah alterasi silikat dan urat yang seragam, dapat diperkirakan bahwa area proksimal terletak pada barat hingga utara area luar penelitian. Terdapat empat domain yang didapatkan dan diuji normalitas datanya yaitu Domain East (A) berupa urat kuarsa pada alterasi silikat arah timur pada lokasi timur zona x, Domain Center (B) berupa urat kuarsa pada alterasi silikat arah barat laut, Domain West (C) berupa urat kuarsa pada alterasi silikat arah timur di bagian barat zona x, dan Domain West (D) berupa urat kuarsa pada alterasi silikat arah barat laut di bagian barat zona x.

.....The research was conducted in the Gosowong Gold Mining Field, which is an Au-Ag mineralization deposit zone. The purpose of this study is to model the distribution of lithology, alteration, and veins, as well as to determine and model the estimation domains based on geological controls on gold mineralization. The data analysis method used includes statistical analysis and implicit modeling based on radial basis function (RBF). This study was conducted using drilling data, including collar, survey, assay, lithology, alteration, and quartz percentage data. The results obtained from this study include 3D modeling and estimation domains of gold resources at the research location. The lithology modeling identified four formation members: Gosowong Basaltic, Gosowong Andesitic, Quaternary, and the Latest Cover. The alteration modeling identified three alteration zones: argillic, propylitic, and silicate. Silicate alteration serves as a marker for the proximal area. There are a total of 18 veins with a dominant eastward orientation. Based on the uniform direction of silicate alteration and veins, it is estimated that the proximal area is located from the west to the north outer area of the study area. Four domains were identified and their data normality tested: Domain East (A), consisting of quartz veins in silicate alteration with an eastward direction in the eastern part of zone x; Domain Center (B), consisting of quartz veins in silicate alteration with a northwestward direction; Domain West (C), consisting of quartz veins in silicate alteration with an eastward direction in the western part of zone x; and Domain West (D), consisting of quartz veins in silicate alteration with a northwestward direction in the western part of zone x.