

ABSTRAK

GEOLOGI DAN KORELASI SERPENTINISASI TERHADAP KADAR NI PADA ENDAPAN NIKEL LATERIT DI AREA CAMP 1000 DAERAH SANGAJI UTARA, KECAMATAN MABA, KABUPATEN HALMAHERA TIMUR, MALUKU UTARA

Oleh
Dhavinka Octaradinar
NIM: 111210124
(Program Studi Sarjana Teknik Geologi)

Indonesia memiliki potensi sumber daya mineral yang melimpah, salah satunya adalah endapan nikel laterit yang berasal dari pelapukan batuan ultramafik dan tersebar di wilayah timur Indonesia, termasuk Sulawesi, Halmahera, dan Papua. Endapan ini bernilai ekonomis tinggi karena kandungan nikelnya banyak digunakan dalam industri modern. Salah satu faktor penting dalam pembentukan dan distribusi nikel laterit adalah proses serpentinisasi pada batuan ultramafik, seperti peridotit dan dunit, namun hubungan antara tingkat serpentinisasi dan kadar nikel masih jarang dikaji secara khusus di wilayah Halmahera Timur.

Penelitian ini bertujuan untuk mengetahui kondisi geologi dan menganalisis hubungan antara tingkat serpentinisasi terhadap kadar nikel laterit pada zona saprolit dan *bedrock*. Penelitian dilakukan di wilayah IUP PT. Antam Tbk. Unit Geomin Area Camp 1000, Desa Sangaji Utara, Kecamatan Maba, Kabupaten Halmahera Timur, Provinsi Maluku Utara. Daerah ini didominasi oleh batuan ultramafik berupa dunit, peridotit, dan serpentin yang telah mengalami pelapukan tropis.

Metode yang digunakan mencakup pemetaan geologi, analisis geomorfologi dan struktur geologi, analisis petrografi, serta pemanfaatan data geokimia sekunder hasil uji XRF. Hubungan antara tingkat serpentinisasi dan kadar unsur dianalisis menggunakan pendekatan statistik dan visualisasi *boxplot*.

Hasil menunjukkan adanya korelasi negatif antara tingkat serpentinisasi dan kadar nikel, di mana kadar nikel tertinggi ditemukan pada batuan dengan tingkat serpentinisasi rendah hingga sedang, dan menurun signifikan pada tingkat tinggi. Sebaliknya, nilai *Loss on Ignition* (LOI) menunjukkan korelasi positif terhadap tingkat serpentinisasi. Kesimpulannya, tingkat serpentinisasi berpengaruh signifikan terhadap distribusi kadar nikel dalam endapan nikel laterit.

Kata kunci: geologi, halmahera, kadar Ni, nikel laterit, serpentinisasi

ABSTRACT

GEOLOGY AND SERPENTINIZATION CORRELATION AGAINST NI GRADE IN LATERITE NICKEL DEPOSITS IN THE CAMP 1000 AREA OF NORTH SANGAJI AREA, MABA DISTRICT, EAST HALMAHERA REGENCY, NORTH MOMALUKU

By

Dhavinka Octaradinar

NIM: 111210124

(Geological Engineering Undergraduated Program)

Indonesia has abundant mineral resource potential, one of which is laterite nickel deposits that come from the weathering of ultramafic rocks and are spread across the eastern region of Indonesia, including Sulawesi, Halmahera, and Papua. These deposits have high economic value because their nickel content is widely used in modern industries. One of the important factors in the formation and distribution of laterite nickel is the serpentinization process in ultramafic rocks, such as peridotites and dunites, but the relationship between serpentinization rates and nickel levels is still rarely studied specifically in the East Halmahera region.

This study aims to determine geological conditions and analyze the relationship between the level of serpentinization and laterite nickel levels in the saprolite and bedrock zones. The research was conducted in the IUP area of PT. Antam Tbk. Geomin Area Camp 1000 Unit, North Sangaji Village, Maba District, East Halmahera Regency, North Maluku Province. This area is dominated by ultramafic rocks in the form of dunit, peridotite, and serpentinite that have undergone tropical weathering.

The methods used include geological mapping, geomorphological and geological structure analysis, petrographic analysis, and the use of secondary geochemical data from XRF test results. The relationship between the level of serpentinization and elemental levels was analyzed using statistical approaches and boxplot visualization.

The results showed a negative correlation between serpentinization rates and nickel levels, where the highest nickel levels were found in rocks with low to moderate levels of serpentinization, and decreased significantly at high levels. In contrast, the Loss on Ignition (LOI) value showed a positive correlation with the level of serpentinization. In conclusion, the degree of serpentinization has a significant effect on the distribution of nickel content in laterite nickel deposits.

Keywords: geology, halmahera, Ni grade, nickel laterite, serpentinization