

## SARI

Berdasarkan tektonik regionalnya, Prospek Lalomerui merupakan bagian dari ESO (*East Sulawesi Ophiolite*) yang tersusun atas batuan ultramafik yang mengalami pelapukan kimiawi sehingga menghasilkan endapan laterit. Hingga kini nikel masih menjadi produk utama dari penambangan endapan laterit yang berasosiasi dengan batuan ultramafik. Namun dalam keterdapatannya di alam, nikel memiliki asosiasi dengan unsur ikutan lainnya seperti kobalt (Co), mangan (Mn), krom (Cr), dan LTJ (Lantanida, Sc, Y). Karena *Economic Importance* (EI) dan *Supply Risk* (SR) yang tinggi, *Critical Raw Material* (CRM) saat ini sedang gencar dicari karena kebutuhan yang semakin meningkat seiring dengan penggunaannya dalam teknologi tinggi masa kini. Pada endapan nikel laterit, CRM dapat terbawa oleh mineral pembawanya atau terabsorpsi dalam mineral lempung selama proses laterisasi. Penelitian ini bertujuan untuk mengetahui karakteristik mineralogi dan geokimia untuk melihat potensi keterdapatan dan pengayaannya. Penelitian ini dilakukan pada tiga jenis batuan dasar ultramafik yaitu Lherzolit, Harzburgit, dan Serpentin. Sampel batuan dasar dan laterit diambil dari wilayah konsesi PT. Cahaya Mineral Sulawesi. Analisis mineralogi (petrografi dan XRD) dan analisis geokimia (ICP MS dan XRF) dilakukan untuk mengamati karakteristik pengayaan CRM selama proses laterisasi. Konsentrasi Cr dan LTJ meningkat secara signifikan dari batuan dasar ke zona transisi antara zona saprolit dan limonit. Adanya pengayaan LTJ berkorelasi positif dengan peningkatan konsentrasi oksida Mn. Sedangkan konsentrasi Co, Sc, dan PGE meningkat hingga zona limonit. Pengayaannya mencapai 6 sampai 10 kali lipat batuan dasar, hal ini berbanding lurus dengan konsentrasi  $\text{Fe}_2\text{O}_3$ , dan secara mineralogi berbanding lurus dengan keberadaan mineral goethit. Pengayaan CRM di zona transisi dan limonit endapan laterit nikel diharapkan menjadi target penambangan laterit di masa depan dengan memanfaatkannya sebagai *by-product*.

Kata kunci: CRM, LTJ, skandium, PGE, nikel laterit

## ABSTRACT

*Based on the tectonic province, Lalomerui district is part of the ESO (East Sulawesi Ophiolite) which occupied by ultramafic bedrock that has undergone a chemical weathering to produce lateritic deposits. Up to day, nickel still remains a main product of lateritic deposit mining associated with ultramafic rocks, however, nickel also occurs in association with other critical elements such as cobalt (Co), manganese (Mn), chromium (Cr), and REE (Lanthanide, Sc, Y). Due to its high economic importance and supply risk, Critical Raw Materials (CRMs) is currently being intensively sought because of the need for their availability which is increasing following the development of high technology. In lateritic nickel deposits, CRM can be carried by its bearing minerals, or absorbed in clay minerals during the laterization process. This study aims at mineralogical and geochemical characterization to see their potential occurrences and enrichment. This work is focused on three types of ultramafic bedrocks i.e. Lherzolite, Harzburgite, and Serpentinite. Bedrock and laterite samples were taken from within the concession of PT. Sulawesi Cahaya Mineral. Mineralogical analysis (petrography and XRD) and geochemical analysis (ICP MS and XRF) were carried out to observe the enrichment characteristics of CRM during the laterization process. It was observed that the Cr and REE concentration increases significantly from the bedrock to the transition zone between saprolite and limonite zone. The presence of REE enrichment has a positive correlation with an increase in the concentration of Mn oxide. Meanwhile, Co, Sc, and PGE concentration increase up to limonite zone. The enrichment reaches 6 to 10 times of the bedrock, it is directly proportional to the concentration of Fe<sub>2</sub>O<sub>3</sub>, mineralogically it is directly proportional to the presence of the mineral goethite. The enrichment of CRM in the transition and limonite zone of nickel laterite deposits is expected to be the future laterite mining target by recover it as a by-product.*

**Keywords:** CRM, REE, scandium, PGE, nickel laterite