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Nickel and Cobalt Enrichment Zone and Ore Potential Distribution in Sorowako Area and Surroundings, South Sulawesi, Indonesia

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The energy transition can be supported by optimizing the potential of metal elements in laterite deposit as mining materials. The downstream policy forces this sector to process low-grade nickel ore material (1-1.5%) and cobalt (>0.1%), which is known to have prospects for later production, so a detailed method is needed to recalculate the distribution of ore potential. The ordinary kriging geostatistical estimation method using Leapfrog Geo software is used to determine and visualize the distribution of enrichment zones and potential for nickel and cobalt ore. This research used collar and assay data for 218 drill points and also nickel and cobalt content values for 7,738 datums. Production cutoff grade (Ni 1% and Co 0.1%) is used as an indicator to simulate the minimum value of nickel and cobalt content in laterite deposit material. The optimal potential for laterite deposits is explored by inputting the geological control of the deposit domain and assay values (%Ni and %Co) through estimating the tendency of enrichment zone depth, as well as expressing the total volume distribution of nickel and cobalt content values to show a percentage of potential increase in nickel volume and potential cobalt volume. Based on the results of analysis in the research area located in Sorowako, South Sulawesi, it shows that the potential for nickel ore is 80% of the total volume of laterite deposits with low grade material (Ni 1-1.5%) of >3,500,000 m³, high-grade (Ni >1.5%) of >1,800,000 m³, and cobalt volume (Co >0.1%) of >1,600,000 m³. Interestingly, this potential volume results in the prospect of increasing nickel production by around 200% and the utilization of cobalt as a new product. Laterite deposits thickness is around 30 meters with low-grade nickel (1-1.5%) and cobalt (>0.1%) depth at 5-25 meters, and high-grade nickel (>1.5%) depth at 20-30 meters.