

## عنوان مقاله:

Sustainability Analysis of Waste Dump in Mine No. ۴ of Golgohar, Sirjan, for Purpose of Increasing Waste Dump Volume

## محل انتشار:

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## خلاصه مقاله:

The stability of waste dumps is a significant and at times critical issue in the development of surface mines. Due to insufficient space for waste disposal, environmental concerns, and various other factors, Mine No. ۴ at Golgohar Sirjan is not capable of establishing a new waste dump. Given the existing limitations of the mine, the investigation has focused on increasing the dump capacity through the implementation of benches. In this research work, the stability of the waste dump has been investigated using the limit equilibrium method with the Slide3D software, along with a Monte Carlo simulation approach for probabilistic analysis. The results obtained from these methods have been compared with each other. The acceptable safety factor considered for this assessment ranges from ۱.۱۵ to ۱.۲. By adding benches to the eastern waste dump of the mine, a displaced volume equivalent to ۳۶,۷۱۵.۵۶۵ cubic meters has been added to the capacity. The constructed model is based on the topography of the area, with dimensions of ۱۸۵۰ meters in length, ۱۷۵۰ meters in width, and ۱۶۰ meters in height. The results indicate that the safety factor of the waste dump has been calculated as follows using the Spencer, Janbu, and Bishop methods respectively: ۱.۲۶, ۱.۱۹۹, and ۱.۲۲۶. Mine No. ۴ needs to extract ۹۸۳.۵۸ million tons of waste to produce ۷۳ million tons of iron ore. In total, by discharging ۴۲۸ million tons of waste in the northeastern and eastern dumps and adding a bench, a volume of ۵۵۵.۵۷۱ million tons of waste is available for disposing of the remaining waste. Considering the remaining waste volume, space must be allocated for waste disposal to Mine No. ۴.

## کلمات کلیدی:

Waste dump stability, limit equilibrium method, Slide3D software, Monte Carlo simulation method, Golgohar Sirjan mine

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