

<p>Project Title: Advice on Slope Steepening and Optimum Pit Slope Design for Quarry D of South Kaliapani Chromite Mine of OMC Ltd.</p> <p>Project No.: CNP/4933/2019-20</p>	<p>Executive Summary:</p> <p>M/S Odisha Mining Corporation (OMC) entrusted CSIR-CIMFR, Dhanbad, for the slope stability study and optimum pit slope design of South Kaliapani Chromite Mine. The mine is situated in Odisha state and is located about 55km away from Jajpur Keonjhar Road Railway Station (on Howrah-Vishakhapatnam route) of East Coast Railway.</p> <p>The mine is fully mechanised. Shovel-dumper combination is used for overburden removal as well as ore mining. Over the last two decades the area in which this mine is located has accounted for about 95% of the entire production of chrome ore in the country.</p> <p>The mine was operating at an existing overall slope angle of 25°. In order to extract more chrome ore economically & safely, the steepest possible overall slope angle for the quarry was required to be scientifically designed. CSIR-CIMFR conducted geotechnical studies at the mine site. Geomechanical tests of different lithological units were conducted at the soil mechanics laboratory of CSIR-CIMFR mainly for determination of shear strength properties & densities.</p> <p>Slope stability analysis was done by GALENA software which is based on limit equilibrium method which considers the slope performance at the equilibrium condition between the resisting and disturbing forces for sliding and computes factor of safety for the slope.</p> <p>Different possibilities of slope geometry and conditions of pit were analysed in the process of slope optimisation. Overall slope angle from 75mRL to -50mRL level of Footwall slope was recommended as 30 degrees and same angle was recommended for Hangwall side of pit for slope from 140mRL to -50mRL.</p> <p>Suitable recommendation were also provided for slope safety monitoring and slope drainage system. The study helped to increase the slope angle of 190m deep pit from existing 25° to designed 30°. An increase by 5° slope angle will help the mine in saving several crores rupees due to less excavation of waste rock, less dumping space requirement for waste and better mineral conservation.</p>
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