Optimization of Blending Operation for Aswan Phosphate Mines Using Linear Programming


Abstract:

ABSTRACT Purpose. The economic value of phosphate is reduced when randomly blending raw phosphate produced from different mines. Therefore, the blending process of different raw phosphate ores to produce economic percentage of P2O5 is essential to maximize the profit of a mine. Methods. This paper presents an application of Linear programming (LP) method to determine the optimum quantities of phosphate ore needed per each mine for blending process. Three phosphate operations, located in Aswan province south of Egypt, have been chosen for this study namely B1, B2 and C. Findings. The results of LP methods reveal that the phosphate ore of 24% of P2O5 will be produced by blending 16.8% of phosphate ore from operation B1, 9.42% of phosphate ore from operation B2 and 73.78% of phosphate ore from operation C. whilst the phosphate ore of 22% P2O5 will only be obtained by blending 66.43% of phosphate ore from operation B1 and 33.57% from mine B2. Originality. Using the linear programming by applying solver function in mine operations. Practical implications. Applied linear programming in mining as regard mining operations to obtain the optimum solution in mining sites.

Keywords: linear programming, blending operation, profit optimization, phosphate ore deposit

Published In:

Mining of Mineral Deposits , Volume 12 (2018), Issue 4 , pp. 1-8