

Abstract

Geometallurgy involves understanding the spatial variability of a deposit's metallurgical properties to promote optimal resource utilisation. This geometallurgical study investigates the physical and metallurgical iron ore properties that affect blast furnace operation and that are used to market lump iron ore. Different ore types are commonly blended to meet specific blast furnace requirements; thus, knowledge of these properties is crucial. Physical and metallurgical test results were compared with the geological features recorded for core samples. Results were then grouped based on the geological features that affect these properties, including ore texture, competency and chert content. The subgroups enable physical and metallurgical properties to be assigned to all ore exhibiting similar geological features. This provides an understanding of the spatial variation of these ore properties and can subsequently assist in creating the mine's first geometallurgical block model. Planning the mining sequence with full spatial knowledge of the chemical, physical and metallurgical characteristics across the deposit will enable optimal resource utilisation. Additionally, the block model would allow prediction of the physical and metallurgical properties of product beds and promote optimal marketing.