Implicit Geological Modeling - Benefits of Using Geophysics as a Regularizer in Modeling High-Grade Iron Ore Bodies

Raphael Prieto (Vale), André Andrade, Divanir Junior (Master Geophysicist), Moara Matos (Vale), Thiago Mendes (Vale)

Implicit Geological Modeling - Benefits of Using Geophysics as a Regularizer in Modeling High-Grade Iron Ore Bodies

Introduction

The common practice in the spatial representation process of a deposit or mineral body (modeling) recommends the use of geological information (mapping points, drilling, petrophysics, chemical analyses, etc.) as constraints, boundary conditions, or regularizers in geophysical modeling (inversion). In this work, the process was carried out in the reverse direction, and the benefit of using geophysical information as regularizers in the geological modeling process (implicit modeling) was evaluated.

Method and/or Theory

Geophysical products (enhancement maps and inversion models) were integrated and interpreted in the structural context, promoting the linkage of control points and trends in adjusting the parameters of implicit modeling via a radial basis function search algorithm.

Results and Conclusions

The executed 3D modeling presented promising results, confirmed by drilling and promoting the addition of mineral potential.