



Manuel Bustillo Revuelta

Mineral Resources

From Exploration to Sustainability Assessment

Series: Springer Textbooks in Earth Sciences, Geography and Environment

- Equips students to handle the diverse situations in mineral resource exploration, evaluation and exploitation
- Outlines each of the varied exploration methodologies and how to interpret the geochemical database results
- Numerous step-by-step examples help the reader to learn quickly about mineral resource evaluation
- Summarizes the basic guidelines to evaluate mining projects EIAs worldwide
- Outlines each of the main mining software programs for geological exploration and mining design

This comprehensive textbook covers all major topics related to the utilization of mineral resources for human activities. It begins with general concepts like definitions of mineral resources, mineral resources and humans, recycling mineral resources, distribution of minerals resources across Earth, and international standards in mining, among others. Then it turns to a classification of mineral resources, covering the main types from a geological standpoint. The exploration of mineral resources is also treated, including geophysical methods of exploration, borehole geophysical logging, geochemical methods, drilling methods, and mineral deposit models in exploration. Further, the book addresses the evaluation of mineral resources, from sampling techniques to the economic evaluation of mining projects (i.e. types and density of sampling, mean grade definition and calculation, Sichel's estimator, evaluation methods – classical and geostatistical, economic evaluation – NPV, IRR, and PP, estimation of risk, and software for evaluating mineral resources). It subsequently describes key mineral resource exploitation methods (open pit and underground mining) and the mineral processing required to obtain saleable products (crushing, grinding, sizing, ore separation, and concentrate dewatering, also with some text devoted to tailings dams). Lastly, the book discusses the environmental impact of mining, covering all the aspects of this very important topic, from the description of diverse impacts to the environmental impact assessment (EIA), which is essential in modern mining projects.

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