

Ore type characterization of the Per Geijer iron ore deposits in Kiruna, Northern Sweden

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ABSTRACT

Kiruna in Northern Sweden is famous for its economically important iron-oxide apatite (IOA) ores, consistently mined by Luossavaara-Kiirunavaara AB (publ.), commonly known as LKAB, for over 100 years. The Per Geijer ore bodies northeast of the Kiirunavaara mine constitute significant mineral resources in form of hematite-magnetite mineralization. First identified in the late 1900s, the Per Geijer deposits were mined in four separate ore bodies namely Nukutus, Henry, Rektorn and Haukivaara mainly during the 1960's, 70's and 80's. The fifth buried ore body Lappmalmen is only known from drilling and geophysics. The Per Geijer ores show a large variation in texture, mineral composition and relation to wall rocks. They reveal mostly high phosphorus content and/or pure hematite ores, respectively. The highly elevated concentration of apatite as gangue mineral contributes to the high phosphorus content of these ores, responsible for the final close-down of production in 1987. The development of new processing methods and the implementation of flotation plants contribute to a reassessment of these ores. The establishment of reliable, sufficient and detailed information about the mineralogy, texture of the ore and its modal mineral distribution, in context with the local geology is key incitement for this project. Especially the characterisation of ore types based on the magnetite/hematite ratio, silicate and apatite content is one of the fundamental aspects in understanding its potential amenability to the beneficiation process.

Keywords: ore characterisation, Kiruna, LKAB, apatite, iron ore