

### **PROSPECTING AND EXPLORATION**

The term "prospecting" is the systematic process of searching for a mineral deposit by narrowing down areas of promising enhanced mineral potential. It covers geological, geochemical and geophysical fieldwork plus the complementary laboratory studies directed to the discovery of workable mineral concentrations. The target of prospecting is to find useful mineral deposits and appraise their suitability for further evaluation.

Depending on the character of local natural factors, the phase of work and the purpose of prospecting, different field and laboratory methods are used to discover direct indications of mineralization. These indications are followed by prospecting-exploratory workings and, in turn, by exploration of the deposit.

In the search for mineral deposits it is impossible to examine in detail every square km of the area or country by, for example, drilling. This would be too expensive, time-consuming and in most cases pointless. An area where the required mineral resources can be expected to occur is therefore delimited using prospecting criteria, that is, geological features which directly or indirectly suggest the presence of a given deposit.

Economic deposits are then explored, the quality of the raw material is determined by sampling and the reserves are calculated by means of surface, underground and drilling works. Exploration should be distinguished from investigation or research of a wider nature (e.g. basic investigation) and laboratory work (e.g. mineralogical research). The discovery, study and exploration of a mineral deposit is a long-term procedure which begins with the establishment of prospecting criteria and indications in the general and preliminary prospecting stages, and ends with the depletion of the deposit.

The exploration of mineral deposits is conducted in two stages, preliminary and detailed.

*Preliminary exploration* is carried out on those deposits which, according to prospecting results, proved to be most promising. Brief characteristics of the two stages and methods applied are presented in Table 46. The most important task of preliminary exploration is to assess the economic value of the deposit with reasonable accuracy. Such exploration must also provide sufficient information so that an adequate method of detailed exploration may be selected. On the basis of a technical-economic evaluation the decision is taken on whether detailed exploration is advisable or not. If a deposit proves to be workable but its exploitation is postponed for 10-15 years, it is considered a state reserve.

*Detailed exploration* is started on economically important deposits which are intended for immediate development as part of a programme for exploiting mineral resources and in agreement with local industry. The aim is to appraise the reserves and assemble all data necessary for the construction of a mining plant. Apart from certain details, the working methods for the two exploration stages are practically the same, but as the stages differ in their objectives, the degree of precision to which the deposit is explored also differs.