Sohlbereich des Baches aus, so schneiden sie nach erfolgter Sohlanhebung an der Oberkante der Auffüllung das Gelände. Generell konnte aufgezeigt werden, dass die Bergwasserverhältnisse entscheidend für die Stabilität der gesamten Talflanke sind. Es wurden daher spezielle Maßnahmen zur weiteren Erkundung und zum Monitoring der Bergwasserverhältnisse vorgeschlagen.

Die Methodik der Kombination einer geologisch-geotechnischen Betrachtung mit Einsatz von geotechnischen Stabilitätsberechnungen kann gut auf andere langsame Massenbewegungen angewendet werden. Somit wird bereits in der Planungsphase eine Optimierung und Evaluierung der baulichen Maßnahmen möglich.

Magmatic control of volcanic hosted mineralizations in the Carpatho-Pannonian region

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Neogene volcanic hosted mineralizations of the Carpatho-Pannonian region show a great variety of styles and geological settings. Simple monogenetic andesite stratovolcanoes either show no mineralization or they host barren HS hydrothermal systems (± Hg). Mature andesite stratovolcanoes involving differentiated rocks and subvolcanic intrusions host variably barren and/or productive HS hydrothermal systems, HS as well as LS hydrothermal systems, or LS hydrothermal systems only. Multiple stage complex andesite stratovolcanoes with late stage rhyolites host early intrusion related mineralizations as well as the late stage LS hydrothermal systems. Areas of the bimodal andesite/rhyolite volcanism host intrusion related HS and LS systems as well as hot-spring/LS hydrothermal systems related to rhyolite dome/flow complexes and regional extension. In deeply eroded areas we distinguish counterparts of the above mentioned mineralization styles - unmineralized andesite/diorite porphyry intrusions, intrusion related base metal stockworks ± LS epithermal veins, skarn type magnetite and base metal mineralizations, skarn/ porphyry and porphyry type Cu ± Mo,Au mineralizations, variably with related suite of HS and LS epithermal veins.

To consider a magmatic control of the mentioned variability in mineralization styles we should be aware of several generally accepted principles. These are: (1) a volume of magma contributing metals to the average size ore deposit is at the order of tens to hundreds of km^3 - it follows, that the subvolcanic stock is rather channelling fluids then being their ultimate source; (2) low salinity of primary magmatic fluids at the order of 2-10 %; (3) partitioning of high temperature saline fluids into gas-enriched low salinity vapour and hypersaline brine at pressures less than 0.5 - 1.5 kbars; (4) HS and related porphyry hydrothermal systems evolve in two stages, the second metal-bearing stage showing similarities with LS systems (moderate pH, lower salinity, meteoric water component).

In view of these principles the observed variability of mineralization styles might be explained by differences in the magmatic evolution, a formation of the high level crustal magma chamber and the level of emplacement of subvolcanic stocks being the most critical aspects (these are in turn governed mostly by crustal thickness and density structure, regional stress field, magma density, volume of magma and rate of magma supply).

Generally speaking, mineralizations will associate only with those volcanoes or volcanic fields, which have reached the maturity stage associated with the evolution of magmas in the high level crustal magma chambers. Emplacement of the subvolcanic stock into the region of saline fluid partitioning creates conditions for the evolution of the HS system, as well as the complementary Cu-porphyry and intrusion related LS systems. Due to a progressive crystallisation of the stock and a decrease in temperature, the early stage marked by the vapour-brine partitioning and related advanced argillic alterations of the HS system is followed by the stage of deeper fluid separation, giving rise to mineralization itself (only if connected to a larger magma chamber, otherwise HS system would be barren and complementary porphyry and LS systems rudimentary). The subvolcanic stock emplaced deeper will not pass through processes related to the fluids partitioning. Reduced and diluted magmatic fluids in such the case give rise to the LS systems not related to contemporaneous HS and Cu-porphyry systems. Longer living shallow crustal magma chambers evolve via anatexis and AFC processes towards silicic composition - with or without a preceding stage of andesitic volcanism. This type of shallow magma chambers supplies fluids to the deeply rooted LS systems associating with rhyolite volcanic activity and horst/graben systems.