Statistical framework for potash grade

Potasio Rio Colorado explores for potash in the southwest of Argentina. The potassium salts are extracted by the well investigated methodology of solution mining.

The drill core shows clearly distinguishable strata, KCl salt crystals, areas of impurity and indicator clay horizons

A STATISTICAL SIMULATION PROCESS WAS DEVELOPED IN VULCAN™ SOFTWARE FOR TWO OF THE RELEVANT GEOLOGICAL VARIABLES, TO DEFINE A TEST STATISTICAL FRAMEWORK IN WHICH TO QUANTIFY THE UNCERTAINTY.

There is only limited data for the deposit, firstly because its geometric characteristics restrict access to the potassium source, and secondly because the extraction methodology doesn't require much drilling.

Therefore, as much grade information as possible must be provided by whatever data is available, either directly or by inference. Just as with the direct data, statistical inference from limited information involves errors, which must be quantified for better management of the potash production plan.

A statistical simulation process was developed in Vulcan™ software for two of the relevant geological variables, to define a test statistical framework in which to quantify the uncertainty.

The project had five stages:

- Intensive review of the process and definition of the relevant variables to be modelled

- Analysis of available information and setting of work environments

- Modelling the variability of uncertain variables and validation against existing geological knowledge

- Simulation of geological contacts and potassium grades

- Review, validation and analysis of the information created, and generation of calculation procedures.
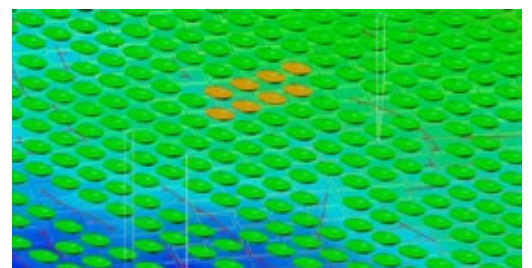
This modelled information is compared with the final results for each processing plant. Deviation parameters are analysed to identify opportunities for improvement in the different operational processes.
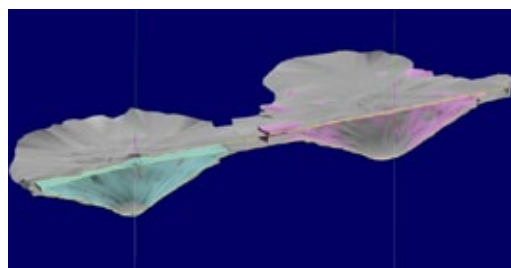
Pilot caves

3D cave layout model