PROJECT DESCRIPTION

Confidential Client

North America

GHLS

Itasca developed a numerical model to estimate gold (Au) production from heap-leach operations. The objective was to simulate Au heap leaching using a model based on fluid flow and mass-transport (hydrodynamic modeling) in a partially saturated pad, and quantitatively assess monthly production of gold-cyanide production (AuCN).

ITASCA'S ROLE

Itasca adapted a publically available two-dimensional (2-D) code (titled MOFAT, an unsaturated chemical transport code) to simulate gold heap leach performance. The code was modified to assign the content of the gold in the ore and to calculate gold depletion. An enhanced solver and algorithm were added to the code in order to maintain a mass balance between gold in the ore and the pregnant solution, creating a robust and efficient code as well as a user-friendly Windows™ graphical interface that can be used to facilitate the entry of data, such as gold contents, hydraulic conductivities, and so forth. The resulting code is called the Gold Heap Leach Simulator (GHLS).
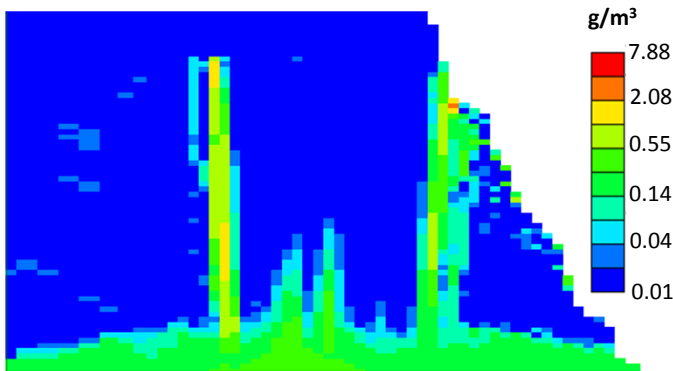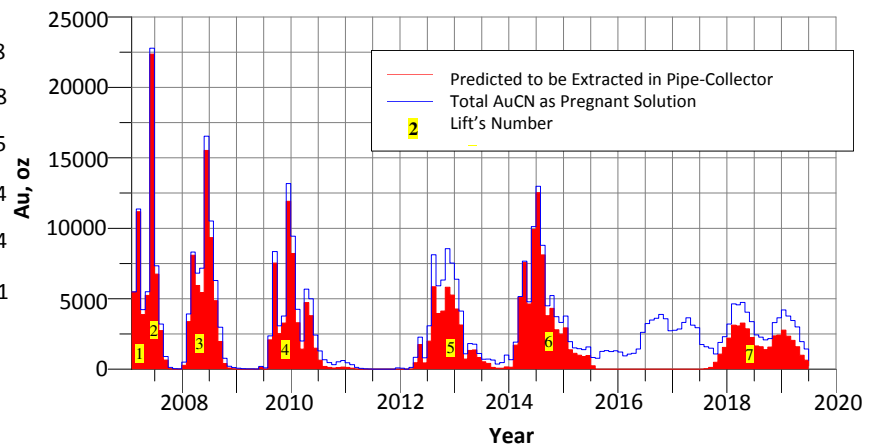

Figure 1. Pregnant Solution Concentration

Figure 2. Results of predictive simulations of monthly Au production

PROJECT RESULTS

Initial work on the model incorporated the results of numerous column tests in order to calibrate the model to field conditions. The code can also be used to assist in the design and optimization of heap-leach pads based on hydraulic properties of ore, moisture and gold contents. Questions that can be addressed by the code include those relating to lift height, lixiviant application rates, timing of lixiviant applications, and rinsing and draindown.