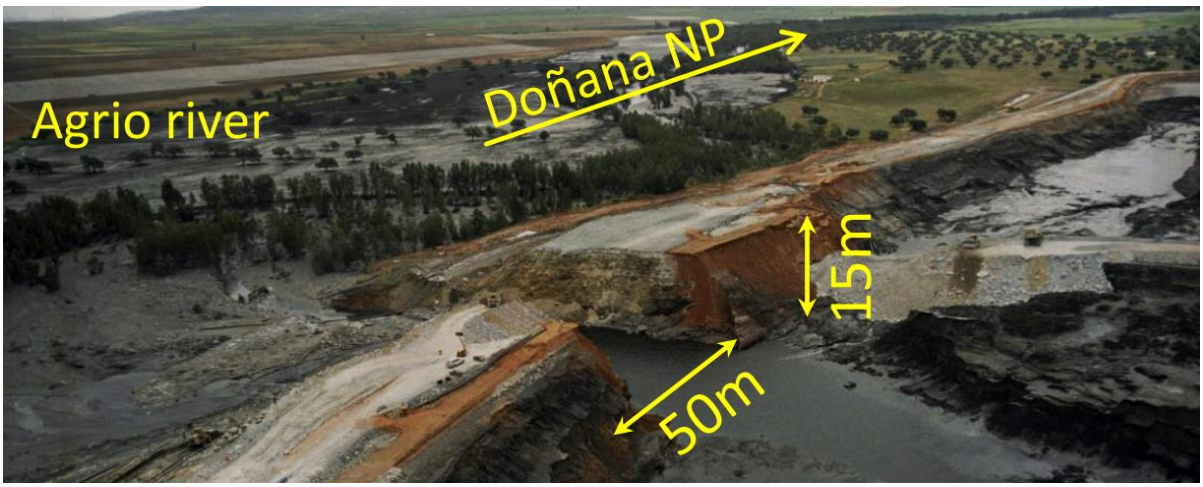
HGM
HYDROGEOMODELS AG

Tösstalstrasse 23
8400 Winterthur, Switzerland
+41 (0) 52 212 21 70
info@hydrogeomodels.ch
www.hydrogeomodels.ch

An experimental geochemical barrier at Aznalcollar

Client: Spanish Ministry for Environment

Keywords: Pumping/injection tests, site characterization, model calibration, contamination, hydrogeochemistry



Summary: The tailings pond of the Aznalcollar Mine broke down on the night of April, 25th, 1998. As a result, 3000 ha were flooded with a sludge made up of pyrite and minor amounts of Cu, Zn, As and PBS sulfides. The hazardous nature of this material generated a worldwide concern. The environmental pollution situation is almost back to normal because most of the sludge was removed mechanically within one year of the accident. Still, some pollution remains in the top soil and a portion of the aquifer has been contaminated. This work summarizes the site characterization studies, the laboratory experiments and the numerical models we did for designing the experimental geochemical barrier to reduce groundwater pollution caused by the Aznalcollar tailings spill. Site characterization has been achieved by means of electrical vertical soundings, mechanical boreholes, pumping and tracer tests and extensive water sampling. The design of the barrier composition has been aided by laboratory column experiments. These have been qualitatively reproduced by means of a numerical model, that has allowed us to simulate the long-term behaviour of the barrier. With all this we have built three modules 30 m long, 1.4 m wide, filled with a different proportion of calcite, organic compost and iron so far, results are good.