Following a rockslide in 2018, a landslide was reactivated affecting the town of Viella in the Hautes-Pyrénées (South France). The slope movement threatens road infrastructure and buildings. The landslide is in the Bayet-Badoueil watershed. This torrential stream has its source on the heights of Viella and has the Bastan river as its outfall. The Bastan flows at the toe of the landslide. The landslide is compartmentalized and covers an area of about 50 ha. The whole thing rests on a Devonian substratum. The colluviums are composed of schists and limestones (Devonian). The study aimed at improving the state of knowledge of the Viella landslide to better manage the natural disaster. Water circulation within the massif is the motor of the sliding. Modelling the hydrogeological conditions allow better understanding the phenomena and will help to design mitigation solutions. A three-dimensional geological model was built as a prerequisite of the hydrogeological modelling with the 3D GeoModeller software. The model was built from the geological map, the logs of the fifteen drillings, including eight piezometers and seven inclinometers, as well as 3D geophysical models (3D resistivity model, 3D P-wave velocity model). The heterogeneity of the colluvium was simplified into two layers to locate the rupture surface at the interface of these layers. The depth of the rupture surface in relation to the topographic surface varies from a few meters below the Bayet to 55 meters deep at the I10 inclinometer. The construction of the geological model makes it possible to improve knowledge of the local structures and to propose geometry for the formations and the position of the rupture surface. The realization of a three-dimensional finite element water flow model, built from the geological model and an electrical resistivity model, with the software FEFLOW (©DHI) provides an understanding of the functioning of the landslide aquifer. This integrative approach on hydrogeological modeling makes it possible to propose a robust model which made it possible to establish the piezometric map of the site at equilibrium. In the landslide, the piezometry is between 780m and 970m the general orientation of the groundwater flow is about 340° north. The hydraulic conductivities determined by the model are between $10^{-4}$ and $10^{-5}$ m.s$^{-1}$ in the colluvium under the village. From the calibrated model, various simulations were
carried out to estimate the impacts of mitigation works on the water storage and circulation. It further helped to simulate the piezometric response of the slope to a flood event at the toe of the landslide. Model simulations showed that the ("sealing" or "waterproofing") of a 650m section in the lower part of the Bayet-Badoueil stream would lower the piezometric height under the village to a maximum of 30m and reduce the hydraulic load upstream of the landslide. A decrease of 5 to 10 meters seems achievable and would be sufficient to significantly reduce the sliding kinematics.