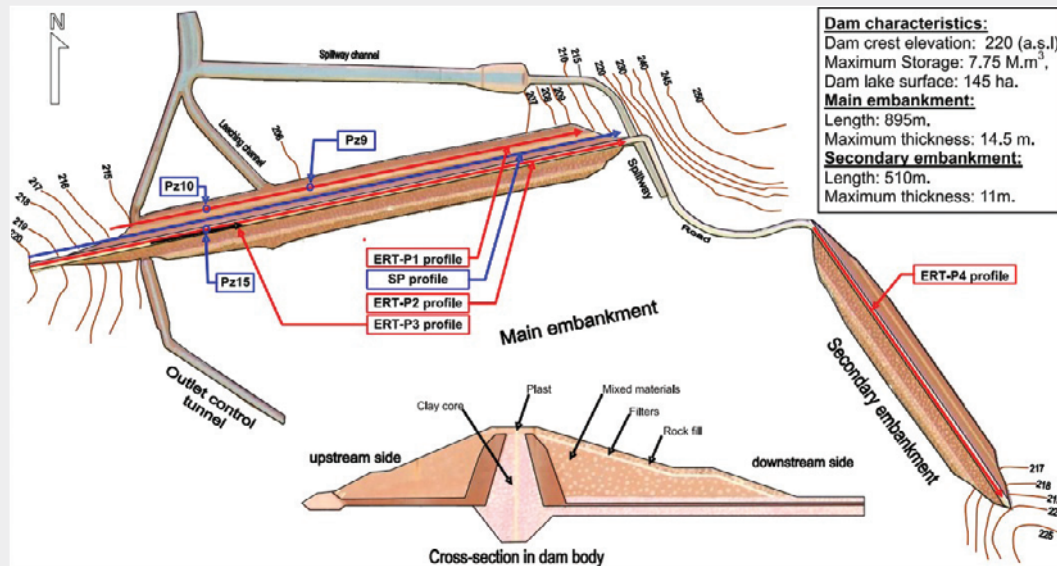


Characterization of abnormal seepages in Earth Dams

Resistivimeter SYSCAL PRO SWITCH 72

The earth dam of Salhab, built in 1993 and located in northern-west of Syria consists of two separated embankments. The main one extends east-west along a distance of 895m with 14.5m height, while the second embankment towards northwest-southeast over a distance of 510 m and 11 m of height.

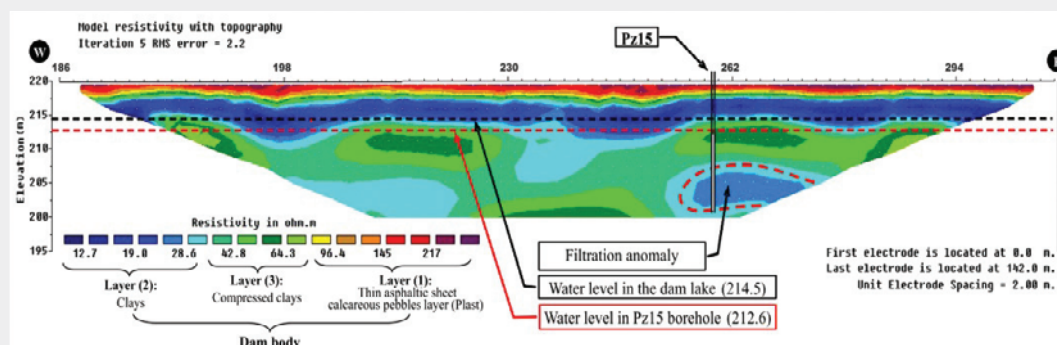
CASE STUDY



Water flow was observed from the piezometric wells (Pz). In the current case study, the Electrical Resistivity Tomography (ERT) and Self Potential methods were used to characterize the possible zones of water leakage through mapping in detail the subsurface structures of the geological formations underneath and behind the dam body. A number of electrical resistivity tomography profiles combined with SP measurements have been carried out (ERT-P).

The ERT profiles

For each profile, electrodes were planted every 2 to 5m. Each standard sequence (Schlumberger-Wenner) of 360m length includes 759 measuring points distributed on 16 levels of depth. In the case where the profile is longer than the standard sequence (up of 360m), a roll-along sequence or more are required to end the profile of the measurements. The roll-along sequence used includes 304 additional measuring points.



The interpretation of the ERT profiles confirmed the differences in the subsurface geological structure under the main and secondary embankment bedrocks of the dam. With respect to the ERT section carried out on the top of the secondary embankment, the embankment appears to be homogeneous and impermeable, and the bedrock does not show any manifestations of leakage or filtration at least within the available investigation depth.

Consequently, it is believed that most of the leakage or outflow processes in Salhab earthen dam occur through the bedrock under the two edges of the main embankment of the dam as well as through the area close to the spillway channel.

Characterization of abnormal seepages in Earth Dams

CASE STUDY



SYSCAL PRO SWITCH 72

SYSCAL PRO Switch 72 is a versatile electrical resistivity-meter which combines a transmitter, a receiver and a switching unit in one single casing. **It allows to simultaneously control 72 electrodes.** The output specifications are 800V (1 600V peak-to-peak) in switch mode, 2.5A, and 250W (12V battery).

The SYSCAL Pro Switch uses multi-core cables for controlling a set of electrodes connected in a line or in several lines. The 72 electrodes can be increased through a Switch Pro 72 unit.

Based on a ten channels configuration, SYSCAL PRO Switch allows to carry out up to 10 readings at the same time for a high efficiency.

Walid AL-FARES, 2019. *Contribution to geophysics and Geodesy. Vol.49/4. pp. 441-458.*