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This paper describes the extensive site investigation performed in support of IBWC Dam Safety Modification Study (DSMS) of Amistad Dam, Del Rio, Texas. The paper presents how the multiple investigation techniques were used to identify anomalies, corroborate previous findings, validate and calibrate information and develop a 3D geological model of the site. The field investigation included surface geophysical surveys, downhole geophysics, soil borings, test pits, piezometers, a dye tracing study as well as the installation of an extensive automated monitoring system. The geophysical study for the project included techniques such as microgravity, electrical resistivity imaging survey, and multichannel analysis of surface wave survey (MASW). The 3D geological model of the site incorporates historical and recent site information. The model is a practical tool to visualize data, identify potential flow paths and help develop remedial measures.

The dam is founded on karstic terrain and leaks a significant volume of water. Numerous sinkholes have formed in the upstream side of the dam in the last several decades, which were repaired locally. The Dam has been assigned a Dam Safety Action Classification (DSAC)-II Potentially Unsafe rating. The failure modes of the dam are related to foundation (Limestone Formation) and embankment (filter incompatibility) conditions.

Amistad Dam is a 9,760 meters long earth embankment dam with a 665 m long and 290 m high concrete gravity section, in the Rio Grande (Rio Bravo in Mexico) river. The dam is owned and operated by the International Boundary and Water Commission (IBWC), a binational Commission created by the United States and Mexico. The United States Section of IBWC (USIBWC) is the US component of the IBWC; its counterpart is the Comisión Internacional the Límites y Aguas (CILA).