

Cedar Lake, a privately owned, man made lake in central Oklahoma mysteriously failed November 7, 1986. The 75 acre lake, 30 feet deep at the dam, dropped 15 feet within a 36 hour period. Water exited the ground 250 yards downstream of the earth fill dam leaving the embankment intact.

The dam was located in the lower section of a highly fractured, loosely cemented sandstone formation. The most likely cause for the failure was creation of a communication route between the preexisting fractures and the waterbearing sandstone reservoir below the lake bed.

### **SOLUTION**

Western Sportsmen Club, owner of the dam, awarded a \$456,000 contract to The Judy Company to repair the dam. Repairs included enlarging the breached section of the dam, performing drilling and consolidation grouting, and construction of a grout cutoff wall.



No significant voids were encountered where the failure was suspected. Drilling continued along the right abutment where voids from 2 to 3 feet were located above the unconsolidated zone. Voids as much as six feet were subsequently encountered up to 215 feet away from where the failure was suspected.



891 C.Y. of sand/fly ash consolidated fill and 250 C.Y. of cement pressure grout were placed. Four piezometers were installed at the downstream toe to continue monitoring the groundwater level as the lake filled.

The Judy Company services were performed under the direction of Pat Carr, P.E. with Dean Van Gorp supervising in the field. McCormick Engineering provided plans and specifications. The project was inspected by Cecil Bearden of the Oklahoma Water Resources Board.

Call 913-422-5088 for more information on this project and the services we perform.