

## Bells Lake Dam Engineering

*Greenwood Park Bells Lake Community Club*

*Washington Township, NJ*

Bells Lake in Washington Township, New Jersey is a 31-acre lake formed by the impoundment of a local stream. During a storm, the Bells Lake Dam was overtopped, causing a partial breach. To restore this dam and prevent future overtopping, the Greenwood Park Bells Lake Community Club selected Princeton Hydro to investigate, design, and permit the improvement of the dam.

Because of the steep incline of the downstream slopes on the dam's earthen embankments, Princeton Hydro began by conducting a stability analysis. Princeton Hydro scientists supervised soil borings and obtained topographic surveys to conduct the analysis using PC/STABL. It was determined that the embankments did not need further stabilization. Following this survey, Princeton Hydro coordinated a topographic survey and a wetland delineation. The team then reviewed the revised spillway capacity analysis and conducted a structural inspection of the dam.

To prevent future overtopping of the dam, Princeton Hydro designed articulated block mats, which would be placed on the downstream side of the dam. These mats would form a cable-reinforced concrete block mattress which would resist erosive forces and flex with water movement. To stabilize the mats, Princeton Hydro engineers recommended a cost-effective fill, replacing the more expensive concrete option. To further stabilize the structure, Princeton Hydro also advised the removal of the sluiceway, gate and concrete walls along the upstream side of the dam.

Once the designs were completed, Princeton Hydro team members began the permit application process. Construction is expected start in 2008.

