

## **Optimal Pumping from Skimming Wells**

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### **ABSTRACT**

A field problem involving pumping of groundwater from a series of existing skimming wells to meet drinking water needs from a river flood plain is examined within a conceptual framework. A simplified hypothetical aquifer system that is representative of a study area, skimming wells, input variables, and aquifer parameters is solved using a simulation-optimization (S/O) approach. The S/O model proposed in this study is solved as a nonlinear, nonconvex problem using a simulated annealing algorithm and a variable density flow simulator. An artificial neural network is used to replace the simulator to reduce the computational burden. An optimal pumping schedule in terms of location and pumpages is presented that controls up coning from underlying saline water. The study suggests that an increased number of skimming wells do not necessarily yield more water, and that the pumping schedule must be staggered in space and time.

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