

Example Exam Question (Fall 1996)

ERS 100

2)

Several wells penetrating a confined aquifer screened at a depth of 600 to 650 ft below land surface service a small town water supply. As the population of the town grows there is a concern that severe land subsidence will occur if the aquifer is overdrawn during drought years. With the attached plan view sketch and the table, estimate the time requirements (days) for the piezometric surface of the aquifer to be drawn down 180 ft at the town center due to continuous pumping by all three wells.

Table 1: Town well field data

Well	Q [gpm]	Distance from center [ft]
A	75	3900
B	130	4200
C	200	4100

3)

A large 420 ha irrigation project developed in a desert region allows for continuous cropping of forage for export. The project is served by a 15 km² reservoir that has an annual evaporation rate of 1.7 m. properly designed drainage wells, on a 1 km square grid in the project each pump at a rate of 18.2 m³/sec to maintain the water table at an elevation of 27 m or less above an aquitard. The homogeneous sand aquifer above the aquitard has $K = 5$ m/day. During a prolonged electrical failure, resulting in the drainage wells not operating for a 30-day period of continued irrigation, the regional water table rose at a rate of 1.0 cm/day. Estimate S_{ya} for the sand (Assume $r_w = 0.15$ m)