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OVERVIEW OF ARTIFICIAL RECHARGE PROJECTS: PLANNING AND IMPLEMENTATION CHALLENGES

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Artificial recharge is a process to replenish an aquifer through engineered systems. Systems commonly used for artificial recharge include spreading basins, infiltration galleries and vadose zone wells. Artificial recharge may also be accomplished by direct subsurface injection. Sources of water for recharge may include diverted storm water runoff and stream flow or recycled water. Artificial recharge projects may be key elements in the long term water resources management plans for many New Mexico communities and developments.

This paper will discuss the multiple factors which require careful consideration for the successful design of an artificial recharge project. Most important are the subsurface characteristics on the geologic and hydrologic properties of the vadose zone and the aquifer. The most common design and operational factors which limit infiltration will also be discussed.

This paper will review the variety of methods available to predict the performance of an artificial recharge system, including simplified mathematical equations, numerical simulations, or prior experience in similar settings. Compilations of infiltration rates from the operations of existing artificial recharge systems will be presented. Case studies of artificial recharge systems will be presented for sites in California, Arizona, Texas and New Mexico.

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