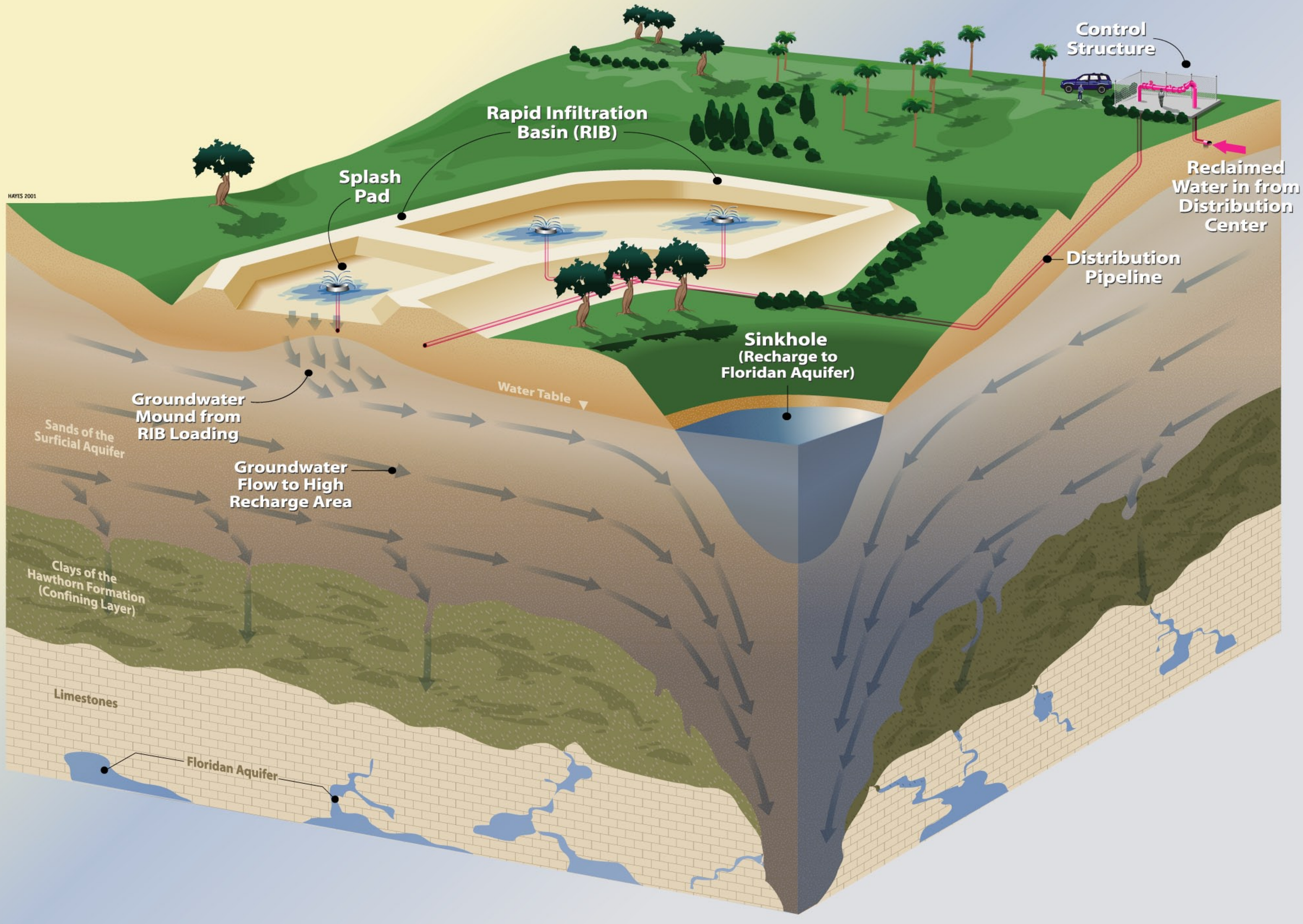
Water Conserv II

Beneficial Water Reuse



ANATOMY OF A RIB

Faced with a need to expand wastewater treatment service and a state requirement to eliminate discharge to surface waters, Orange County and the City of Orlando formed a long-term partnership to develop an innovative water reclamation program.

WATER CONSERV II is the largest reuse project of its kind in the world, combining agricultural irrigation with aquifer recharge via rapid infiltration basins (RIBs). The project enables the City and County to make beneficial use of reclaimed water by recharging Florida's primary drinking water source, the Floridan aquifer. With the Year 2001 expansion of the facility, WATER CONSERV II has the capacity to recharge an average of 21.7 million gallons a day of reclaimed water through the RIBs, as depicted above.

Reclaimed water is pumped from the City's McLeod Road and the County's South Regional Water Reclamation Facilities through a 54-inch diameter transmission main approximately 21.5 miles to the WATER CONSERV II Distribution Center in western Orange County. The water is temporarily stored in four 5-million gallon prestressed concrete flow-equalization reservoirs and then distributed to the RIBs through a network of distribution pipes, as shown in magenta above. The entire process is monitored and carefully controlled by computers housed at the Distribution Center.

Including the Year 2001 expansion, the system consists of 63 RIBs, each made up of one to five cells, for a total of 129 individual cells measuring approximately 350 feet long by 150 feet wide. The facility is built over a natural sand ridge ranging in thickness from 30 to 200 feet. Beneath these surficial sands is a dense concentration of semi-permeable clays known as the Hawthorn formation. The Hawthorn acts as a barrier separating shallow groundwater flow within the surficial sands from deeper, confined flow in the Floridan aquifer, which is comprised primarily of fractured limestones and dolomites. In this region of Orange County, shallow groundwater in the surficial sands follows primarily lateral flow patterns above the Hawthorn until reaching areas of low resistance that permit significant vertical flow downward into the Floridan aquifer, thus replenishing our drinking water supply.

Reclaimed water percolating from a RIB cell into the permeable sandy soils below creates a mounding effect between the bottom of the basin and the original groundwater table. The percolating water combines with shallow groundwater and follows local directions of flow toward areas of least resistance. As depicted in the illustration above, the local direction of shallow groundwater flow beneath the basin is toward an area of low resistance to vertical flow that was created when sand and clay overburden collapsed into a limestone cavity to form a sinkhole. The sands within the sinkhole throat extend from ground surface to the limestones, creating an area where surficial aquifer waters can directly replenish the Floridan aquifer. Initially of sufficient quality to meet most state and federal primary and secondary drinking water standards, the reclaimed water continues to be polished as it travels through the surficial sands and deeper limestones.

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