

Artificial Recharge in New England

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ABSTRACT

Artificial recharge of aquifers in New England is currently rare. Only one utility (Dover, New Hampshire) uses it to boost production from four of its wells. Other municipalities have used artificial recharge in emergency. However, the potential exists for considerable expansion of artificial recharge throughout the region. In fact, it will become an essential tool in the region's efforts to protect in-stream flows in rivers, which are currently being depleted by withdrawals from wells by induced recharge throughout the year, but most significantly during low flow periods in summer.

Dover backed into artificial recharge accidentally, via a gravel washing operation that incidentally benefited two of the City's wells by recharge of wash water directly to the aquifer. Subsequently the City constructed a second artificial recharge system that pumps 1.5 million gallons per day from a river to a gravel pit from November through May, when river flow is high. Both systems have been operational for 20+ years, showing no deleterious water quality effects.

Wells operated by Pittsfield, ME and Alfred, ME artificially recharged aquifers close to their production wells during drought periods in 1991 and 2001, when natural recharge to the aquifer was insufficient to keep up with municipal withdrawals. No water quality problems were noted. Artificial recharge was discontinued when new wells were installed in nearby aquifers.

Newmarket NH artificially recharged treated surface water to one of its well sites in 2002-04 only to find that trihalomethanes present in the treated water were not filtered by aquifer materials, and exceeded MCL in well water. Newmarket is now investigating the possibility of recharging with raw river water having high color and turbidity.

Withdrawals of water from aquifers, rivers and lakes throughout New England have recently collided with a regional concern to maintain in-stream flows. The conflict is especially dire during low flow periods of summer when water usage rates are typically highest. The result can be fish kills or dry river beds, neither of which are culturally acceptable. Massachusetts has set severe limits on permitting of new wells and cut previously permitted withdrawals from existing wells due to these concerns.

The practice of artificial recharge of aquifers during high flow seasons (fall, winter, spring) has the potential to allow amelioration of the conflict. River water can be stored in aquifers, banking it for increased use in summer, reducing impact on nearby rivers to de-minimus levels.