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CONJUNCTIVE WATER MANAGEMENT, CLIMATE CHANGE, AND POTABLE REUSE ASR

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ABSTRACT: This paper combines reviews completed by the author of:

- 1) Links between ASR/Conjunctive Water Management and climate change
- 2) Management measures and regulatory programs for potable reuse ASR

The first review was completed informally in 2008 for events marking the 20th anniversary of Jim Hansen's testimony to Congress on climate change. This brief overview addresses the links between ASR, recharge ponds and other forms of conjunctive water management with climate change adaptation and mitigation.

The second part of this paper summarizes a national review recently completed which profiled systems that use advanced tertiary treated municipal wastewater with aquifer storage via direct injection in which the recovered water is intentionally used for potable reuse. Aquifer storage via direct injection has been used to provide a means of reusing reclaimed water, providing an economically viable means of storing advanced treated water while providing an "environmental buffer" and additional subsurface treatment before reuse. Most reclaimed water has been used in systems designed for nonpotable reuse, and stored in nonpotable aquifers, and many systems use recharge with reclaimed water only through basins or vadose zone wells. However, there has been recognition of the ability to use aquifer injection and storage as a part of the process by which advanced tertiary treated municipal effluent can be reused for potable uses by treating the aquifer as an environmental buffer. These potential benefits of direct injection aquifer storage for potable reuse of reclaimed water are being integrated into policy approaches, such as the California Groundwater Recharge and Reuse Project regulations under development, specifically addressing the residence time, retention time, and other considerations associated with subsurface water quality improvements and incorporation of the aquifer as one of the "multiple barriers."

This paper will review how direct injection for reclaimed water ASR can be incorporated into water managers' planning to meet increasing and competing water demands for both nonpotable and potable water supplies in the face of climate change.