

Managed Aquifer Recharge in the Reclaimed Water Master Plans

Vilanova, Ester (1); Martínez, Begoña (2); Guimerà, Jordi (1); Aguiló, Pere (2); Solà, Albert (2)

(1) *Amphos 21 Consulting S.L., Barcelona, Spain*

(2) *Consorci Besós Tordera, Granollers, Spain*

ester.vilanova@amphos21.com

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ABSTRACT

Water scarcity prompts to investigate alternative water resources to mitigate the balance between resources and demands in highly populated areas. In the last ten years, technologies for waste water treatment have evolved to the extent that reuse of reclaimed water is not only possible, but it is common practice. Despite the fact that the regulatory framework for water reuse is still different in different parts of the World, management practices in countries of long-lasting water scarcity are evolving due to the imperative needs to obtain additional sources of water – Europe, has not implemented yet a definitive framework directive of Water Reuse for the state members, only a recent proposal on minimum requirements for water reuse in agriculture (COM (2018) 337 final) - . Hence, programs for water reuse or for non-potable water exist and are being implemented in arid parts of the World, where alternative uses are given to reclaimed water.

Managed aquifer recharge with reclaimed water is an alternative strategy that is being implemented in these programs. Differently to conventional fresh water sources like river or rain water, reclaimed water needs to demonstrate a quality of water so that not only does not pose health threads to public, but also does not worsen the groundwater quality. Under these circumstances, aquifers candidates to receive reclaimed water for either replenishment or store-and-recovery must have specific features in a context of proximity of water treatment plants, presence of extractive infrastructure for water use -namely extraction wells or users- and potential for water store. In addition, the distance of the potential injection or infiltration sites must be such that the residence times of recharged reclaimed water complies with the requirements of risk analysis.

In this context, this article presents the methodology developed for the Reclaimed Water Master Plan of the Besós Tordera river basins, two small catchment areas near Barcelona, that are highly populated, concentrate intensive industrial demand, require water for both agriculture and golf courses and need to complain with the quality and quantity standards of surface water under semi-arid climate conditions. As indicated above, the methodology combines multiple ratios of different nature -distance to water sources, infrastructure, hydrological regime and storage capacity of the aquifers- that results in a scoring tool that it is a relevant tool for decision making.