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ASR-Coastal (Aquifer Storage & Recovery in coastal, brackish-saline aquifers)

Product Owner : KWR Watercycle Research Institute

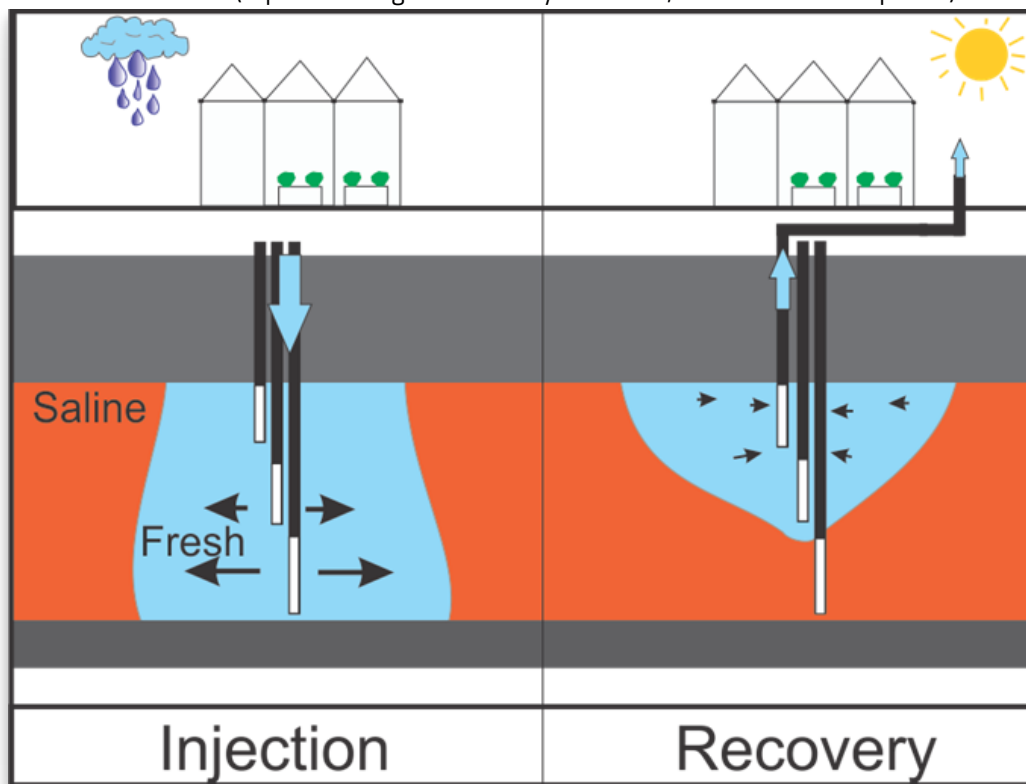
Category : Technology (hardware)

Stage of Commercial Development: commercially available

Stage of Commercial Development Info: TRL 8 System complete and qualified



ASR - Coastal is an innovative technology to safeguard a sustainable fresh water supply in coastal areas. The idea behind ASR - Coastal is to infiltrate freshwater surpluses like e.g. rainwater and surface water during rather wet periods in the deeper subsurface via multiple partially penetrating wells (MPPW) for shallow recovery when it is needed. Optionally, intruding brackish-saline water can be intercepted and used as additional freshwater resource upon desalination. This method of injection and recovery makes it possible to satisfy the seasonal supply-demand, and meanwhile counteracts both salt water intrusion and subsidence.



Application & Target Markets :

The technology is a commercial product, suitable for both small-scale and regional application of aquifer storage and recovery (ASR) in (confined) brackish to saline coastal aquifers. At the moment, it is primarily used for greenhouse horticulture.

Competitive Advantages :

This is an innovative solution that significantly increases the recovery efficiency of freshwater compared to conventional fully penetrating wells or (single) partially penetrating wells in brackish to saline aquifers, deemed unsuitable for freshwater storage because of the combined impacts of upconing, mixing and drifting.

This provides the means to maintain a reliable freshwater supply for agricultural production in times of water demand (if needed in combination with reverse osmosis (RO)) with a relatively constant water quality. Currently, freshwater is solely stored in aboveground basins and supplemented with brackish water reverse osmosis (BWRO) if needed, which depletes and/or salinizes the groundwater reservoirs, and increases both salt water intrusion and subsidence.

Details :

License / Copyright:	Proprietary
License Info :	Public Domain and Commercial
Costs :	EUR > 50,000
Costinfo :	On request
Type of Hardware:	Instrumentation & control

Case Studies :	<p>The Westland reference site (Demo site within the DESSIN project)</p> <p>How Subsurface Water Technologies can Provide Robust, Effective, and Cost-Efficient Solutions for Freshwater Management</p> <p>How multiple partially penetrating wells improve the freshwater recovery of coastal aquifer storage and recovery (ASR) systems</p> <p>Reactive transport impacts on recovered freshwater quality during multiple partially penetrating wells in a brackish aquifer</p> <p>SubSol - Subsurface Water Solutions - reference sites</p>
WFD Objectives :	<p>Setting objectives, Selecting measures, Pressures and impacts, Planning process, Modelling and prediction, Infrastructure planning</p>
Issue :	<p>Climate change and energy, Ecosystem services, Urban areas and Water conservation and recycling.</p>
Relevant Water Bodies:	<p>Coastal and transitional waters, Groundwater, Wetlands, Rain and precipitation and Other.</p>
Relevant Water Bodies Info:	<p>Fresh surface waters (influx), Coastal (brackish to saline) groundwater (reservoir)</p>
Target User Group:	<p>Research organisation, Industry consultants, Government (and associated bodies) - policy, Regulator, Funding and investment, Training provider, Water user representative and Other.</p>
Target User Group Info:	<p>End-users (e.g. (horticultural) farmers)</p>
Type of Input requirements :	<p>The technology requires basic understanding of groundwater flow, the influence of density differences, pumping, aquifer hydraulics, (geo)hydrology, water engineering, (geo)chemical monitoring, etc.</p>

Type of Output : Positive impacts are: better use of fresh precipitation / surface waters (less transport to sea), limited saltwater intrusion, limited subsidence because of reduction in use of RO (mining of groundwater (if not replenished)), reduced aquifer/soil salinization, better productivity of the crops as a result of improved quality control, reduced (or prevented) overall shortages of freshwater, reduction in area required for aboveground storage (allowing for alternative land uses), less costs concerning desalination by e.g. reverse osmosis, reduced flood risks during extreme rainfall events (delayed discharge via subsurface), better water resource management, improved seasonal coverage of freshwater supply and demand.

Potential to combine this product with other products : This technology can be combined with desalination techniques such as reverse osmosis (RO), or e.g. in combination with water harvesting systems like green roofs.

Supported Legacy Systems : ASR automated controlling unit (BE-De Lier)

Supported Standards

Standard Category : ■ Processes and Models

Version : 2011

Project & Promotional Material About the Product :

- Poster: Optimizing small- to medium-scale aquifer storage and recovery (ASR) in coastal aquifers for irrigation water supply
- Waterbuffer Showcase, which can be visited on working days on request.

Organisation/Institution : KWR Watercycle Research Institute

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Partners



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www.waterinneu.org

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