



## Grundfos electrolysis Selcoperm enhances safety at Dublin's covered reservoirs

A fully automated electrochlorination system underpins the successful upgrade of water treatment at **Stillorgan storage reservoir in Dublin, Ireland**. Along with safer, more reliable drinking water for the community, significant savings in chemical costs are expected over 20 years.

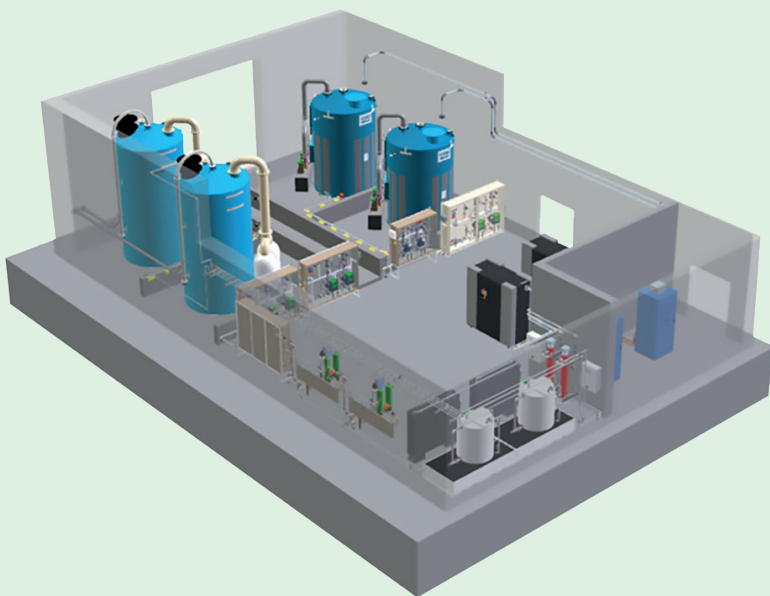
Operated by Dublin City Council on behalf of Uisce Éireann (formally Irish Water), the reservoirs historically supplied over 200,000 customers in the Dublin City region.

### The Challenges

The Stillorgan reservoirs sit on a 16-hectare site in south Dublin, Ireland. The three water bodies have historically served as a storage facility for treated drinking water from treatment plants in Vartry, Co Wicklow and Ballymore Eustace, Co Kildare.

The Stillorgan site was one of only two uncovered drinking water reservoir sites in Ireland. Open storage of treated drinking water places the supply at direct risk of environmental pollution from wildlife, or contamination from unauthorised access, vandalism or terrorism.

To ensure a secure and sustainable water supply for the region, that meets current and future regulatory requirements, Uisce Éireann decided to end open storage at Stillorgan by decommissioning two of the reservoirs and upgrading the third to become a covered storage reservoir, treated with enhanced disinfection technology.



## The solution



Grundfos was selected to install its SelcoPerm Electrolysis System (SES) on the newly covered reservoir. This water treatment solution generates 0.8% sodium hypochlorite onsite, providing multiple benefits over alternative disinfection processes, including lower operating and maintenance costs. SES is safer to use and low in carbon consumption.

Grundfos also undertook design the chlorination room, providing installation drawings, and assisting the contractor during installation and commissioning.

## Transforming water together

In addition to supplying two 15kg/h duty-standpoint SelcoPerm units, Grundfos also supplied rectifiers, water filtration and softening systems, water heating systems, 14m<sup>3</sup> product storage tanks, 15 tons salt saturators, brine dosing skids, sodium hypochlorite dosing skids, a sodium thiosulphate dosing skid and a hydrogen detection system.

**Ross Pegley**, senior executive engineer at Dublin City Council, oversees the Stillorgan covered reservoir, explains;

*“The technology installed by Grundfos is a step-change in terms of the resilience for water treatment. Previously we used chlorine gas, and our ability to control the dose level was challenging and labour intensive. Before the Grundfos system was installed, we had interventions at the site morning and evening.”*

The most widespread disinfectant used in drinking water treatment is chlorine, which can be applied in many ways. Generally, three methods are used for chlorinating drinking and process water: chlorine gas dosing, dosing of commercial sodium hypochlorite solution, and onsite

generation of electrolytic sodium hypochlorite. Onsite electrolysis - directly generating the sodium hypochlorite from a common salt solution using electricity - offers a number of advantages.

The disinfectant solution itself boasts a long half-life and can be stored for a longer period. The system also eliminates the need for pH adjustments when disinfectant is introduced into the water flow, which is often required with other products. SES is modular and designed for the safe production of a 0.8% sodium hypochlorite solution from a saturated brine solution and is suitable for the disinfection of drinking water and industrial process water.

## Benefits and applications

SES is an excellent alternative to chlorine gas or commercial sodium hypochlorite in water treatment for drinking water and industrial processes.

*“With the Grundfos system, the site essentially runs itself, although we still carry out regular maintenance and operational checks. It is 100% reliable – we’ve never had an incident,”* said Pegley.

*“From a reliability perspective, we have five dosing skids with 10 dosing pumps, and we could lose nine of them and still meet all our dosing requirements from one. I have nothing but praise for the system – it has made my life easier!”*

*“The technology we had before was dated and it was a challenge to get the right dosing levels. The upgraded system gives fine control over the dosing levels, which also means we get no complaints about taste.”*



## Benefits of disinfection with Selcoperm Electrolysis System:

- Safe and reliable
- Common salt is non-toxic and easy to store and handle
- Only water, salt and electricity are needed for effective electrolysis, meaning low operating costs and suitability worldwide
- Fresh sodium hypochlorite is readily available and does not dissociate like commercial solutions
- Low formation of chlorate as a by-product
- Fewer safety requirements than chlorine gas based systems
- Lower pH value than commercial sodium hypochlorite reduces scaling of injection units in hard water areas
- Robust design for easy installation and maintenance
- Long service life
- Reduced chemical use means less transport and storage and lower carbon footprint

## Enhanced safety features

As the Stillorgan reservoir site is in an urban centre, any gas leak would pose a potential risk to both employees and the public. Replacing the chlorine gas disinfection system with Selcoperm has significantly improved safety at the site.

Since electrolysis generates hydrogen as a byproduct, robust safety features are built into SES. To eliminate risk, most of the hydrogen is diluted to 25% of the lower explosive limit (LEL) by the degassing fan before it even reaches the storage tank.

Any remaining hydrogen is further diluted before being safely released into the atmosphere.

The entire system is continuously monitored with redundant safety measures. Multiple sensors throughout the system, along with additional hydrogen sensors at the installation site, are in place to trigger an automatic shutdown in case of any malfunction.

These safety features are rigorously evaluated by an independent expert from TÜV SÜD Product Service. This review ensures safe operation without the need for additional explosion protection measures at the installation location.

Selcoperm is outside requirements for Dangerous Substances & Explosive Atmosphere Regulations and does not come under the ATEX 2014/34/EU directive for equipment used in potentially explosive atmospheres - meaning the Selcoperm and any other components or electrical items can be installed safely without risk of fire or explosion and does not require any hazardous zoning.

Legislation on the use of disinfectants in water treatment is country-specific. Please contact your local Grundfos sales office for further advice and support.