

Glenkiln Reservoir: Engineering a Low- Carbon Drawdown Solution

**SPECIAL REPORT | Reservoir engineering •
Temporary works • Environmental control**

**HOW GEORGE LESLIE AND
SELWOOD USED NATURAL
HYDRAULIC HEAD TO LOWER
RESERVOIR LEVELS SAFELY,
PROTECT WATER QUALITY AND
REDUCE RELIANCE ON DIESEL
PUMPING.**

1,500 l/s combined siphon capacity	17m hydraulic head
2 x 750 l/s dual line arrangement	Reduced diesel use gravity-led transfer

At Glenkiln Reservoir, George Leslie required a controlled method of lowering water levels to support critical improvement works while maintaining safety, resilience and strict environmental controls. Working with Selwood, the team developed a dual siphon system capable of transferring up to 1,500 litres per second without the need for conventional large-scale diesel pumping.

THE CHALLENGE

The reservoir needed temporary drawdown to enable construction of a new concrete cut-off downstream of the overflow weir

and installation of a new hydraulically operated scour valve at the valve tower. The works depended on keeping water levels within a defined operating range throughout the programme.

Using the existing scour valve for prolonged drawdown was not suitable because of the risk of disturbing accumulated silt and affecting downstream water quality. The project needed a high-capacity temporary works solution that could combine hydraulic performance with environmental assurance.

At a glance

A constrained reservoir setting demanded a practical system that balanced flow capacity, safe installation, temporary works control and water quality protection.

THE APPROACH

George Leslie and Selwood designed a dual siphon arrangement that used the reservoir's natural hydraulic head rather than powered pumping plant. Each line was designed to transfer up to 750 litres per second, giving the project the capacity needed to reduce and control reservoir levels.

The 17m elevation difference between reservoir level and discharge point introduced important hydraulic and structural considerations, including flow stability, pipe restraint, safe access, buoyancy control and management of the forces generated through high-volume transfer.

Specialist butt fusion welding equipment was brought to site to assemble the large-diameter pipework. The completed

pipelines were then floated into position across the reservoir, with installation planned around limited working space on the dam crest and the need to maintain robust health, safety and environmental controls.

Engineer's note

The solution turned a simple hydraulic principle into a controlled, low-carbon temporary works system for a sensitive reservoir environment.

ENVIRONMENTAL CONTROL

By using gravity-led transfer, the siphon arrangement removed the need for major diesel pumping. This reduced fuel consumption, emissions, refuelling activity and the presence of additional mechanical plant within a sensitive water environment.

The intake arrangement was designed to avoid drawing from areas likely to mobilise silt and sediment, helping protect downstream watercourses and support water quality requirements during drawdown.

A battery-powered monitoring system provided alerts to the site team, improving operational resilience while reducing reliance on fossil-fuel-generated power.

THE RESULT

The project delivered a safe, controlled and sustainable method of reservoir drawdown. The dual siphon system gave George Leslie the transfer capacity required to support critical improvement works while reducing environmental impact and avoiding the operational burden of large-scale diesel pumping.

“The Glenkiln solution shows how collaborative engineering can convert a complex temporary works challenge into a safer, lower-carbon and highly practical method of reservoir level control.”

WHAT'S NEXT

The approach provides a strong reference point for future reservoir and water management projects where high-volume transfer is required in environmentally sensitive settings. It also reinforces the value of early collaboration, disciplined temporary works planning and practical innovation in delivering sustainable infrastructure outcomes



**GEORGE
LESLIE**