

## SECTION 10 | FINAL SHORTLIST

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### The final shortlist – common elements for all strategic options

A key finding of this approach is that all shortlisted options share a substantial common foundation of infrastructure and catchment-wide interventions. These measures, outlined in the table below, are designed to reduce pollutant inputs at source, improve wastewater system performance and strengthen long-term resilience across the catchment. As a result, a significant proportion of the environmental, operational and resilience benefits are common to all shortlisted options irrespective of where wastewater is ultimately treated and discharged.

#### Common elements

Each shortlisted option incorporates a common package of wastewater, surface-water, highway-run-off and catchment-management interventions. Together, these measures provide the foundation of the ORiW solutions and are designed to work alongside the major transfer infrastructure.

All options assume a step change in treatment performance through new, state-of-the-art wastewater treatment works. These are located close to existing sites, making use of United Utilities-owned land to minimise development on greenfield land and reduce costs. Where possible, existing wastewater treatment works around the lake would be converted into pumping or transfer

assets, with treatment processes decommissioned to reduce the long-term infrastructure footprint in sensitive locations. The options also include first-time sewerage for rural properties and businesses reliant on privately owned and operated wastewater systems, together with a Rainwater Management Framework that uses SuDS, surface water separation and nature-based solutions to reduce polluted run-off, improve urban amenity and support a greener drainage system.

By reducing surface water entering the sewerage system, these interventions also help limit the scale of downstream transfer and treatment infrastructure required, with associated benefits for pumped volumes, whole-life cost, carbon and operational resilience.

#### Common elements of the preferred two final solutions vs key variables

##### Common elements are:

- Catchment-wide interception of wastewater before it reaches Windermere
- Rationalisation and optimisation of existing wastewater assets
- New enhanced wastewater-treatment capability
- Surface-water separation
- First-time sewerage for currently unsewered properties and businesses
- Improved management of private wastewater systems
- Highway-run-off management and treatment
- Nature-based drainage measures
- Sustainable Drainage Systems (SuDS)

##### Variables are:

- The location of the enhanced wastewater treatment works to treat all flows
- The location of the final discharge point
- The method used to transfer flows, comprising a tunnel, a rising main, or an optimised combination of both

While the study is grounded in engineering practicality and deliverability, its conclusions draw on a wider multi-disciplinary evidence base, including environmental constraints, consenting risk, operational resilience, community and visitor-economy impacts, ecology and wider economic considerations. For example, all options were assessed for their potential impact on Windermere's lake levels, including implications for water resource management, navigation and recreational use, and the ability to maintain operational and business continuity. This broader perspective ensures the preferred ways forward are evaluated not only for technical credibility, but also for their overall deliverability, value and ability to achieve the ORiW objectives.



## Options for transferring wastewater



### Rising main

A rising main is a pressurised pipe system that uses pumping stations to move water, allowing it to travel uphill or across varied terrain. It is typically installed by digging trenches along roads or through fields. Once constructed, surface sites are needed at intervals to house the pumping equipment and associated infrastructure.



### Tunnel

A tunnel is a deep underground structure that allows water to flow using gravity. It is constructed using trenchless methods, either by pushing pipes through the ground in short sections or by using a large tunnelling machine that bores through the ground and installs a concrete lining as it progresses. These approaches minimise surface disruption compared to other methods. Once constructed, small surface sites are required for access via shafts.



### Hybrid

A solution which incorporates both rising main and tunnel sections to optimise costs and benefits.