

Business Case Document Guide and Programme Background

Only Rainwater into Windermere

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ORiW Business Case: Document Guide and Programme Background

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Business Case Document Guide and Programme

Background summary

Purpose of this Document. The document provides the programme context and explains how the Business Case documents, appendices and supporting technical evidence fit together.

Business Case Document Guide. The Business Case comprises the Strategic, Economic, Commercial, Financial and Management Cases, supported by a Glossary, Risk Register, and Economic Case Appendices. Together, these documents present the rationale for intervention, option appraisal, delivery, funding and financing considerations, and proposed programme management arrangements. The Business Case is underpinned by engineering, environmental, modelling, deliverability and climate resilience evidence. The Document Guide directs readers to the principal reports explaining the development, feasibility and deliverability of the options and to the wider supporting technical evidence.

Purpose and scope of the ORiW Business Case. The Business Case applies HM Treasury's Five Case Model to assess approaches to achieving the ORiW objectives and identify the option offering the strongest overall value for money. It reflects the evidence available at this early appraisal stage and has been developed on behalf of the multi-agency Steering Group. The most preferred way forward identified at this stage is not a final solution and may be refined as further evidence is gathered and designs are developed. Under a standard Green Book approval process, independent scrutiny of the option-selection rationale and structured stakeholder engagement beyond the Steering Group would be required before progressing to Outline Business Case stage.

Programme background. Windermere is England's largest natural lake and an internationally recognised freshwater environment with substantial ecological, cultural, recreational and economic value. Previous investment has reduced nutrient inputs, and AMP8 investment is expected to reduce sewage spills and deliver further improvements. However, modelling indicates that climate change will intensify the effects of the nutrients that remain, increasing cyanobacteria risk and ecological pressures, particularly in the North Basin. More transformational reductions in wastewater inputs are associated with materially improved ecological condition and the elimination of cyanobacteria risk days in both basins.

The Ambition. The ORiW ambition is to remove wastewater and urban runoff discharge risks to Windermere and its surrounding catchment, where feasible, increasing the lake's resilience to future climate conditions. ORiW is being developed alongside AMP8 as a longer-term programme and explores whether more fundamental changes to wastewater infrastructure are needed, rather than relying solely on incremental improvements.

Application of the Five Case Model. The Five Case Model has been applied in full. The Strategic, Commercial, Financial and Management Cases are commensurate with Strategic Outline Case stage. The Economic Case requires independent scrutiny of the option-selection rationale and wider stakeholder engagement before a formal Strategic Outline Case submission under a Green Book approval process.

Scope and boundaries of the ORiW programme. ORiW addresses treated and untreated discharges from United Utilities' public drainage system, private wastewater treatment works and septic tanks, and highway and urban surface water runoff. Other diffuse pollution sources, including agricultural runoff, fall outside ORiW and are being addressed through complementary initiatives.

1. Purpose of this document

This document provides the background context for the Only Rainwater into Windermere (ORiW) programme and serves as a guide to the ORiW Business Case suite of documents and supporting technical evidence.

ORiW is supported by a substantial body of strategic, economic, commercial, financial, management, engineering, technical and environmental analysis. The purpose of this document is twofold. First, it sets out the background to the programme, including the case for change, the ORiW ambition, programme scope and the wider context in which the work has been developed. Second, it explains how the different Business Case documents, appendices and supporting engineering and technical documents fit together and where detailed evidence can be found.

This document should be read alongside the separate ORiW Business Case: Executive Summary, which provides a concise summary of the key findings, conclusions and preferred way forward and recommended next steps emerging from the Business Case.

2. Business Case Document Guide

The ORiW Business Case is organised as a suite of complementary documents. Together, these documents present the strategic rationale for intervention, assessment of alternative options, delivery, funding and financing considerations, programme management arrangements and supporting technical evidence.

Table 1.1 summarises the purpose of each principal document within the suite and where readers should look for different types of information.

Table 2-A: Summary of Business Case document purpose

Document	Purpose
Business Case Glossary	Defines the principal terms, abbreviations and technical language used throughout the Business Case suite.
Business Case Executive Summary	Provides a concise summary of the principal findings, conclusions, preferred way forward and recommended next steps emerging from the Business Case.
Strategic Case	Sets out the case for change, the ORiW ambition, programme objectives, critical success factors and strategic alignment.
Economic Case	Assesses the options and identifies the most preferred way forward through consideration of environmental and social value, whole-life cost, place-based and distributional effects, and risk, resilience and deliverability.
Commercial Case	Considers potential delivery models, procurement approaches, market capacity and capability and commercial arrangements.
Financial Case	Considers affordability, funding and financing arrangements, cost profiles and potential customer bill implications.
Management Case	Describes governance, programme management, assurance, benefits management, stakeholder engagement and delivery arrangements.
Business Case Risk Register	Records the principal risks identified at this stage of programme development and the proposed management approach.
Economic Case Appendices	Provides the detailed assumptions, methodologies, sources, calculations and supporting analysis underpinning the Economic Case.

2.1 Relationship to Supporting Technical Evidence

The Business Case is supported by a substantial body of engineering, environmental, technical, flow and water quality modelling, deliverability, climate resilience and programme-development evidence.

Readers seeking detailed engineering and other technical information should initially refer to:

- A Guide to Engineering Appendices
- Explaining the ORiW Engineering Appendices
- Option Scope and Feasibility Report
- Environment, Stakeholder and Construction Deliverability Report

These documents are supported by and refer to a wider suite of engineering and technical reports that underpin the Business Case.

3. Programme Background

3.1 Purpose and scope of the ORiW Business Case

This report provides the structured analytical foundation supporting the Only Rainwater into Windermere (ORiW) Feasibility Report. It applies the principles of HM Treasury's Five Case Model guidance (HM Treasury, 2026) throughout, covering all five cases: Strategic, Economic, Commercial, Financial and Management. The analysis is conducted to support a formal business case and reflects the depth of engineering and evidential work available at this early appraisal stage. Appraisal involves the assessment of different options for achieving project objectives and selecting the option that represents best value for money – it provides the structure to support decisions to safeguard the environmental, social and economic value of Windermere for future generations. The definition of value for money is given in the HM Treasury Green Book.

The report has been prepared on behalf of a commissioning Steering Group.¹ Options to support this programme have been appraised and costed by Jacobs and Mott MacDonald. A 'most preferred' way forward to achieve the objectives of this project was identified through a structured process led by the Steering Group – drawing on the appraisal and supported by the Jacobs and Mott MacDonald expert team.

The purpose of the optioneering assessment is to identify a viable shortlist of options to inform decisions on which solutions should be progressed to a more detailed appraisal and design development. Although a preferred way forward has been identified at this stage, this should not be interpreted as a final solution. As further evidence is gathered and designs are developed, the assessment may be refined and other short-listed options, or elements thereof, may continue to be considered where they offer potential advantages in terms of performance, risk, affordability and overall value. The principal stakeholders (the 'Steering Group'), with accountability for the programme's outcomes and their active role in shaping the selection, reflects the partnership-led nature of ORiW. This is consistent with Green Book guidance that longlist and shortlist selection should involve key experts and stakeholders (HM Treasury, 2026).

Scope and next steps

This report provides technical and analytical evidence to support the ORiW programme. The Five Case Model framework is applied in full. Before the programme proceeds to Outline Business Case stage, two further activities relating to the Economic Case are required as part of the standard Green Book approval sequence: formal independent scrutiny of the option selection rationale, and structured stakeholder engagement beyond the commissioning Steering Group (HM Treasury, 2026). This assumes the project needs to follow a Green Book approval sequence, which is not a typical requirement for water sector projects with funding allowed by Ofwat.

3.2 Programme background

Windermere is England's largest natural lake and one of the United Kingdom's most internationally recognised freshwater environments. Situated at the heart of the Lake District National Park UNESCO World Heritage Site, the lake provides significant ecological, cultural, recreational and economic value.

Windermere continues to face water quality pressures driven by nutrient enrichment from wastewater and other catchment pressures, including surface water runoff. Investment over previous decades has delivered measurable improvements.² United Utilities' 2020 improvements are estimated to have reduced phosphorus inputs to the North and South Basins by 31% and 30% respectively, relative to pre-2020 levels (Environment Agency, 2023).

¹ Includes; the Environment Agency, Lake District National Park Authority, Love Windermere, Save Windermere, Westmorland and Furness Council and United Utilities.

² United Utilities have invested more than £75 million in wastewater infrastructure upgrades in the Windermere catchment since 2000 (Love Windermere, 2025).

Planned AMP8³ investment from 2025 to 2030 is anticipated to deliver the Storm Overflows Discharge Reduction Plan goal to reduce sewage spills to an average of no more than ten per year, only one per bathing season (Defra, 2023) and deliver further nutrient reductions (United Utilities, 2024).

Notwithstanding the above and in spite of previous and planned investment, evidence demonstrates that ecological pressures will remain. New evidence on the interaction between climate change and nutrient enrichment indicates that these improvements, while necessary, will not be sufficient to protect the lake's ecological condition over the long term. As shown in Table 3-A, the Environment Agency-commissioned modelling (Environment Agency, 2026) estimates that, without any further action and amplified by climate change, the number of algal blooms in Windermere will increase – this can cause ecological deterioration and public health risks. The annual mean cyanobacteria risk days are estimated to increase by approximately 350% and 84% in the North and South basins respectively, as a result of climate change.⁴ After the planned AMP8 investment is completed, the annual mean cyanobacteria risk days are estimated to decrease by 94% in the South Basin in a future climate. However, in the North Basin, the annual mean cyanobacteria risk days are estimated to increase by 200% as a result of climate change. Further mitigation beyond AMP8 investment is required to address these risks.

Table 3-A: Estimated nutrient load, cyanobacteria risk days and projected WFD classifications for each lake basin under a range of mitigation scenarios

Scenario	Windermere Basin	Existing condition	Future climate without further investment	Future climate with AMP8 mitigation	Future climate with no sewage discharges
Phosphate load (kg/yr)	North Basin	4,364	4,359	3,780	1,382
	South Basin	4,139	4,034	2,727	520
Nitrate load (kg/yr)	North Basin	158,014	155,493	155,493	124,050
	South Basin	111,131	115,340	119,945	110,549
Annual mean cyanobacteria risk days, where the WHO10 threshold is exceeded	North Basin	8	36	24	0
	South Basin	50	92	3	0
Projected WFD classifications and normalised chlorophyll EQR values	North Basin	0.646	0.587	0.614	0.729
	South Basin	0.659	0.603	0.682	0.803

Source: Environment Agency (2026). The WFD classifications are indicated by shaded boxes, where: Moderate = Yellow, Good = Green and High = Blue.

The deterioration projected at Windermere is consistent with a documented global pattern. A 2019 study analysing 71 large lakes across 33 countries, using three decades of satellite data, found that peak summertime bloom intensity had increased in 68% of the lakes studied (Ho, Michalak, & Pahlevan, 2019). The UK's Fourth Climate Change Risk Assessment identifies risks to freshwater ecosystems as a priority risk area with elevated urgency and documents climate-driven ecological change already occurring in freshwaters across the UK (UK Climate Risk, 2026).

Reducing wastewater inputs represents the largest opportunity to address nutrient and pollutants pathways entering Windermere. Table 3-A highlights that the WHO10 threshold for cyanobacteria risk is no longer exceeded when removing sewage discharges into the lake and the South Basin would achieve a high WFD classification, despite the pressures of climate change – providing the basis for considering a transformational approach to wastewater and runoff management.

³ The eighth cycle of water company Asset Management Plan (AMP), covering the period from 2025-2030.

⁴ Cyanobacteria risk days are where a particular type of toxic blue-green algae, which is visible, exceeds the WHO10 threshold (10µg of cyanobacteria chlorophyll a per litre) – a threshold derived by the World Health Organisation as signifying low potential for adverse human health impacts. Without further investment, the number of cyanobacteria risk days in Windermere could rise from 8 to 36 in the North Basin and from 50 to 92 in the South Basin by the 2076 to 2079 period, under current climate predictions (Environment Agency, 2026).

Increased public and government interest in the Lake's current condition and its future resilience under climate change has raised the protection of the lake to a matter of significant national and international public interest (Department for Environment, Food & Rural Affairs, 2025). This has brought together a Steering Group to commission a study into the feasibility, value and deliverability of options to achieve the Only Rainwater into Windermere ambition.

The Ambition

The Only Rainwater into Windermere (ORiW) ambition is to remove wastewater and urban runoff discharge risk into the lake and its surrounding catchment, where feasible, providing a long-term intervention designed to increase ecological resilience under future environmental conditions.

This ambition has been supplemented by six SMART Objectives and seven Critical Success Factors. This report presents an initial analysis of an emerging programme, aligned to HM Treasury's Five Case Model.

ORiW represents a long-term resilience response to climate change for an internationally recognised freshwater environment facing increasing environmental pressures. Climate change is a broad, long-term issue that affects the whole system. Evidence suggests that simply improving existing public and private wastewater systems step-by-step may not be enough to deal with its impacts. Therefore, the case for ORiW is about exploring whether more fundamental changes to wastewater infrastructure are needed for Windermere to cope with future conditions.

As England's largest natural lake and a landscape of international importance, Windermere demands a level of ambition equal to its significance. By adopting a transformational approach to achieving this project, Windermere can become a national blueprint for restoring and protecting our most treasured freshwater environments.

Investment is currently being delivered through AMP8, a portion of which supports water quality and environmental performance in the Windermere catchment. ORiW is being developed alongside these investments as a longer-term programme and is expected to build upon the benefits delivered through AMP8. As ORiW develops, further work may be required to understand how future interventions interact with existing and planned assets and associated investment programmes.

3.3 Application of the Five Case Model

This report applies the Five Case Model in full. The table below summarises the treatment of each case within this document and what further development is required to complete Strategic Outline Case (SOC) stage (HM Treasury, 2026).

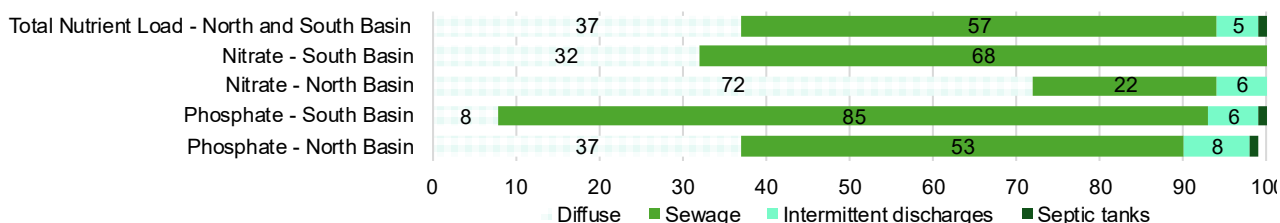
Table 3-B - The Five Case Model and structure of this report

Case	What this case addresses	Stage at this report
Strategic	Establishes the case for change, programme objectives and strategic fit with national and local policy.	Commensurate with SOC
Economic	Options appraisal and value for money assessment, including costs, benefits, distributional effects and risk. Engineering feasibility studies and reports.	Further independent scrutiny of options selection rationale and stakeholder engagement required before formal SOC submission
Commercial	Procurement approach, market viability, not including market engagement, contracting structure and risk allocation.	Commensurate with SOC
Financial	Affordability, funding strategy and phasing across the programme lifecycle.	Commensurate with SOC
Management	Governance, delivery arrangements, risk management and assurance.	Commensurate with SOC

3.4 Scope and boundaries of ORiW

The ORiW programme addresses wastewater and urban surface water runoff discharges into Windermere and its tributaries. Figure 3-A identifies the estimated nutrient source apportionment, with public and private sewage contributing the greatest proportion of phosphate and total nutrient load.

Figure 3-A – Nutrient source percentage apportionment for Windermere

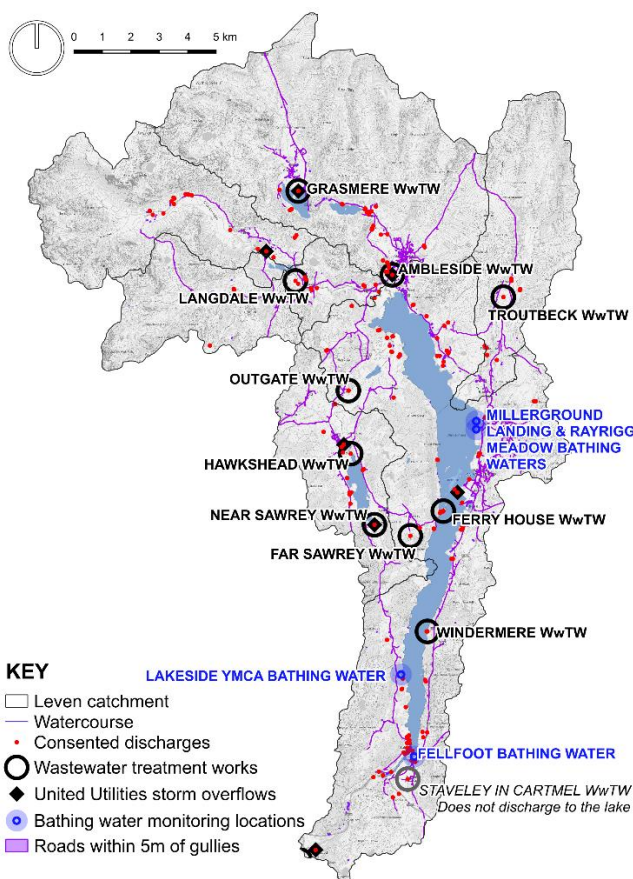


Source: *Nutrient Futures for Windermere, Chief Scientist's Group report*. (Environment Agency, 2026). Note: The referenced data and therefore the phosphate source apportionment for the North Basin does not total to 100% due to rounding effects.

Figure 3-B presents the road network and consented discharges within the Windermere catchment and highlights the disparate nature of wastewater infrastructure and potential highways runoff pollution pressures. The programme scope covers:

- **Treated and untreated discharges from United Utilities' public drainage system.** United Utilities operates ten wastewater treatment works and six storm overflows discharging to the catchment.⁶
- **Discharges from private wastewater treatment works and septic tanks.** There are 92 permitted private discharges within the catchment, and an estimated 1,800 to 2,000 further private discharges via septic tanks and small-scale treatment plants operating under general binding rules.⁷
- **Highway and urban surface water runoff.** The programme scope excludes other potential diffuse pollution sources such as agricultural runoff, as this is being considered through the Land Management workstream, which is one of three priorities in *The Love Windermere Partnership Action Plan 2025-2027* (Love Windermere, 2025).

Figure 3-B - Consented discharges and road networks within the Windermere catchment⁵



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⁶ Windermere WwTW discharges directly to the lake. Although Ferry House WwTW is permitted to discharge directly to the lake, it does not and tankers routinely take wastewater to other WwTW for treatment. Eight WwTW discharge to upstream tributaries (Grasmere, Langdale, Ambleside, Troutbeck, Outgate, Hawkshead, Near Sawrey, Far Sawrey). Although Staveley in Carmel WwTW is within the catchment, it discharges to groundwater close to the lake's outfall to the Leven – therefore the impact on Windermere is unclear.

⁷ This is based on the number of licences within the Windermere catchment as of October 2025, using data within the Environmental Permitting Regulations discharges to water and groundwater data register. There are 75 non-water company sewage discharges, 5 trade discharges and 12 sewage and trade discharges. The number of licences is however subject to change.

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