

NW Drought Plan 2027
Water Framework
Directive (WFD) Report -
Burnhope Reservoir Drought
Action

July 2026

NW DROUGHT PLAN 2027

WFD REPORT - BURNHOPE RESERVOIR DROUGHT ACTION

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NW DROUGHT PLAN 2027

WFD REPORT - BURNHOPE RESERVOIR DROUGHT ACTION

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CONTENTS

1	INTRODUCTION	1
1.1	Background and Purpose of this Report	1
1.2	The WFD Context.....	1
1.3	The NW Plan Context	2
1.4	The WFD Legislation Requirements	4
1.5	WFD Objectives	4
2	BURNHOPE RESERVOIR DROUGHT ACTION.....	5
2.1	Northumbrian Water abstraction licence	5
2.2	Description of Drought Action	5
3	WFD APPROACH AND METHODOLOGY.....	7
3.1	Methodology.....	7
3.2	Study Area.....	7
3.3	Data Sources	8
4	SUMMARY OF STAGE 1 WFD REPORT	10
4.1	Methodology.....	10
4.2	Assessment Findings.....	10
5	SCREENING OF WATER BODIES	11
5.1	Surface Water Bodies.....	11
5.1.1	Burnhope Reservoir Water Body	11
5.1.2	Burnhope Burn from Source to Wear Water Body	13
5.1.3	Wear from Wearhead to Middlehope Burn, Iresho Water Body	15
5.1.4	Wear from Middlehope Burn to Houselop Beck Water Body	17
5.2	Groundwater Body	19
5.2.1	Wear Carboniferous Limestone and Coal Measures Water Body	19
6	SCOPING OF QUALITY ELEMENTS	22
7	ASSESSMENT OF IMPACTS.....	25
7.1	Protected Areas	32
7.2	Invasive Non-Native Species	33
7.3	Assessment of the Proposed Drought Action Against the WFD Mitigation Measures	34
8	CONCLUSION	36

Tables

Table 2.1 NW public water supply abstraction licence details	5
Table 5.1 Water body data for the Burnhope Reservoir WFD Water Body (source: Environment Agency Catchment Data Explorer)	12
Table 5.2 Water body data for the Burnhope Burn from Source to Wear WFD Water Body (Source: Environment Agency Catchment Data Explorer, Cycle 3)	13
Table 5.3 Water body data for the Wear from Wearhead to Middlehope Burn, Iresho WFD Water Body (Source: Environment Agency Catchment Data Explorer, Cycle 3)	15
Table 5.4 Water body data for the Wear from Middlehope Burn to Houselop Beck WFD Water Body (Source: Environment Agency Catchment Data Explorer, Cycle 3)	17
Table 5.5 Water body data for the Wear Carboniferous Limestone and Coal Measures WFD Groundwater Body (Source: Environment Agency Catchment Data Explorer, Cycle 3)	20
Table 6.1 WFD elements in Burnhope Reservoir Water Body (✓ = Scoped In, X = Scoped Out) ..	22
Table 6.2 WFD elements in water bodies downstream until release from TTT at Frosterley (✓ = Scoped In, X = Scoped Out)	23
Table 7.1 Impact assessment for Burnhope Reservoir Water Body	25
Table 7.2 Impact assessment for water bodies until release from TTT at Frosterley	27
Table 7.3 Designated protected sites within or with hydrological / functional connection to Study Area	32
Table 8.1 Compliance of the Burnhope Reservoir drought action with the environmental objectives of the WFD	37

Figures

Figure 1.1 Map showing Northumbrian Water's supply area	3
Figure 5.1 A map showing Burnhope Reservoir WFD Water Body (Source: Environment Agency Catchment Data Explorer)	11
Figure 5.2 A map showing Burnhope Burn from Source to Wear WFD Water Body (Source: Environment Agency Catchment Data Explorer)	13
Figure 5.3 A map showing Wear from Wearhead to Middlehope Burn, Iresho WFD Water Body (Source: Environment Agency Catchment Data Explorer)	15
Figure 5.4 A map showing Wear from Middlehope Burn to Houselop Beck WFD Water Body (Source: Environment Agency Catchment Data Explorer)	17
Figure 5.5 A map showing the Wear Carboniferous Limestone and Coal Measures WFD Groundwater Body (Source: Environment Agency Catchment Data Explorer)	19

1 INTRODUCTION

1.1 Background and Purpose of this Report

Under the Water Industry Act 1991, Northumbrian Water Group (NWG) are required to prepare and update a Drought Plan for each of our supply regions. This document focuses on the Northumbrian Water (NW) supply area. Our Drought Plan must be approved by the Secretary of State for Environment, Food and Rural Affairs and made available for public consultation.

Our Drought Plan will provide a comprehensive statement of the actions we will consider implementing during drought conditions to safeguard essential water supplies and minimise environmental impact within our supply area. The plan will align with our Water Resources Management Plan (WRMP), which sets out the strategic approach to maintaining a supply-demand balance over a 25-year planning period.

We must ensure that our Drought Plan meets the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFD Regulations) before implementation.

This Water Framework Directive (WFD) Report presents a WFD Compliance Assessment prepared in support of the development of our Drought Plan. This report is the second output of the WFD process. This document summarises the Burnhope Reservoir drought action, including the site context, and the findings of the Stage 1¹ WFD Strategic Compliance Assessment which was undertaken in 2025. This report also outlines the approach and methodology adopted and evaluates the potential impacts of drought actions on water bodies within a defined Study Area, in accordance with the requirements of the WFD Regulations.

1.2 The WFD Context

The WFD Regulations 2017, establish a statutory framework for the protection and enhancement of water bodies, including rivers, lakes, estuaries, coastal waters, and groundwater.

Under this legislation, drought actions must be assessed for their potential impact on the ecological and chemical status of nearby water bodies, as defined within River Basin Management Plans (RBMPs). These plans set out environmental objectives and measures to achieve “Good” status, and any proposed development must demonstrate compliance with these objectives, avoiding deterioration and supporting improvement where feasible. Key considerations include surface water runoff, pollution risk, and habitat disruption.

¹ Northumbrian Water. 2026. NW Drought Plan 2027 Strategic Water Framework Directive (WFD) Report. [Unpublished]

1.3 The NW Plan Context

We supply water to approximately 2.7 million customers in the North East of England which extends from the Scottish border in the north to the Yorkshire border in the south and as far west as the Cumbrian border. The major population centres of Tyneside, Wearside and Teesside are located within NW's supply in this area.

In accordance with our WRMP24², the supply area comprises two Water Resource Zones (WRZ) known as the Kielder WRZ and the Berwick & Fowberry WRZ (see Figure 1.1 below). Berwick & Fowberry WRZ is in the far north of the supply area and serves approximately 1% of customers whilst the Kielder WRZ serves the remaining 99% of customers. For more information on the WRZs see NW's Drought Plan Strategic Environmental Assessment Environmental Report (2026)³.

This WFD Assessment focuses on the Burnhope Reservoir drought action, which relates to the Kielder WRZ supplying approximately 99% of customers across NW's supply area. While the action supports water supply resilience across the wider WRZ, it involves a localised and temporary operational change at Burnhope Reservoir, consisting of a reduction in statutory compensation flows during drought conditions at drought level 3a⁴.

The action is implemented in accordance with Northumbrian Water's Drought Plan and requires a drought plan for implementation, with effects confined primarily to Burnhope Burn Water Body and the upper reaches of the River Wear, as demonstrated by hydrological modelling and impact assessment presented in the Environmental Assessment Report (EAR): Burnhope Reservoir Drought Action⁵. The assessment therefore focuses on these water bodies while recognising the wider WRZ context.

² Northumbrian Water (2024). Water Resources Management Plan 2025–2030 (WRMP24). Available at: <https://www.nwg.co.uk/responsibility/environment/wrmp/wrmp-2025-2030/> [Accessed Jul 2025].

³ Northumbrian Water (2026). NW Drought Plan 2027 Strategic Environmental Assessment (SEA): Environmental Report

⁴ Drought levels (1 to 3b) are described in the NW Draft Drought Plan 2027

⁵ Northumbrian Water (2026) Burnhope Environmental Assessment Report (EAR) (incl. monitoring plan & mitigation measures) [Unpublished]. Available on request.

NW DROUGHT PLAN 2027

WFD REPORT - BURNHOPE RESERVOIR DROUGHT ACTION

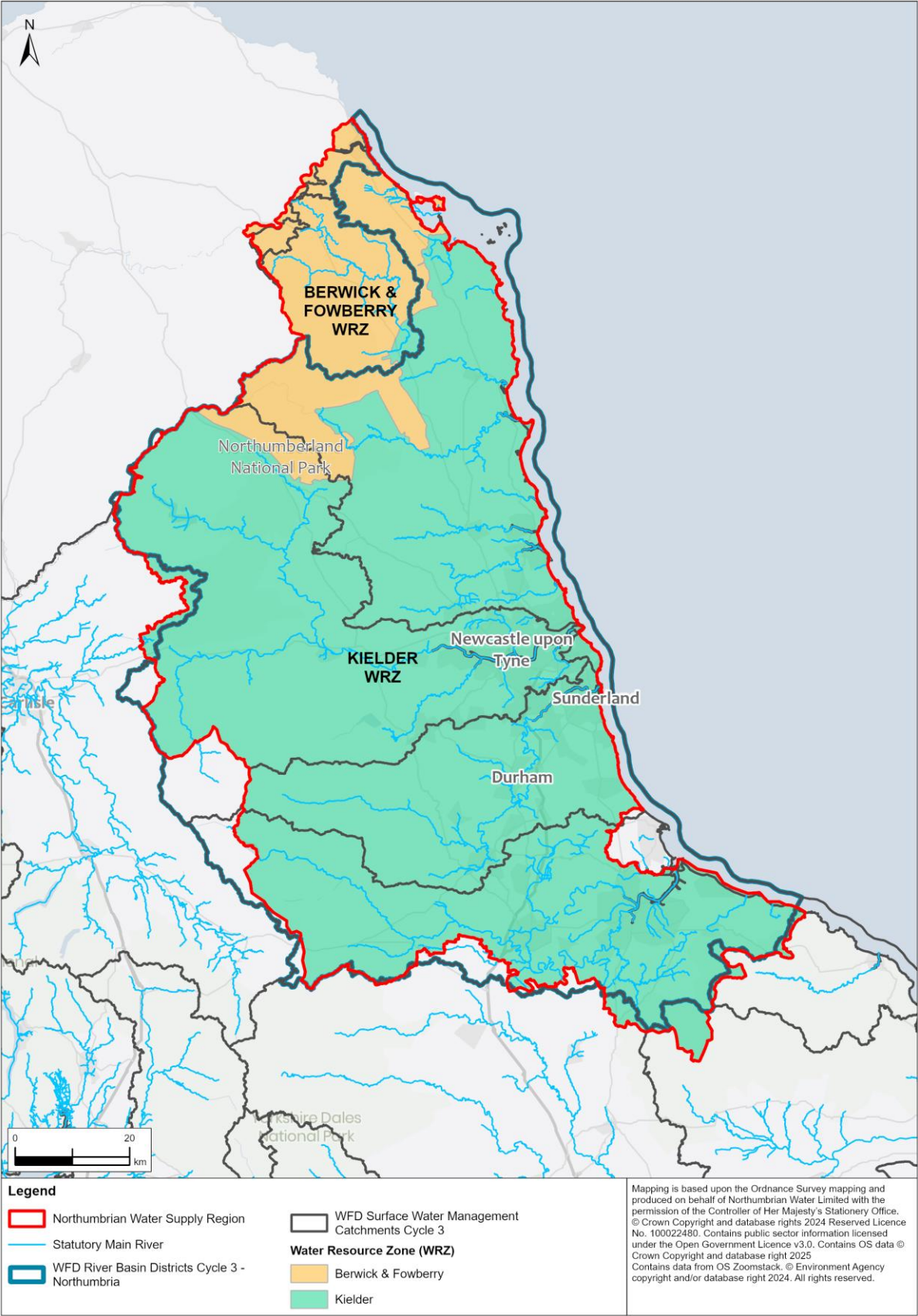


Figure 1.1 Map showing Northumbrian Water’s supply area⁶

1.4 The WFD Legislation Requirements

The WFD Regulations were transposed from the Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000), which was established to provide a framework for managing, protecting and improving the water environment.

The WFD Regulations require natural water bodies to achieve Good Ecological Status (GES) and Good Chemical Status (GCS), and Heavily Modified Water Bodies (HMWBs) or Artificial Water Bodies (AWBs) to achieve Good Ecological Potential (GEP) and GCS, in accordance with the environmental objectives set out under the WFD.

Drought Plans are a statutory requirement meaning there is a legal obligation binding water companies to the requirements of the WFD Regulations. Water companies are required to demonstrate that their plan supports the environmental objectives contained within RBMPs, including preventing deterioration, achieving protected area objectives and achieving water body status objectives.

1.5 WFD Objectives

The main objectives of the WFD Regulations are to:

- Prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters;
- Aim to achieve at least 'Good Status' for all waters by 2027;
- Promote sustainable use of water;
- Conserve habitats and species that depend directly on water;
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and,
- Help reduce the effects of floods and droughts.

⁶ Northumbrian Water (2026). NW Drought Plan 2027 Strategic Environmental Assessment (SEA): Environmental Report

2 BURNHOPE RESERVOIR DROUGHT ACTION

2.1 Northumbrian Water abstraction licence

The operation of Burnhope Reservoir is governed by statutory requirements that mandate a continuous release of compensation flow into the Burnhope Burn. As currently operated, a minimum of 9.09 MI/d is discharged into the Burnhope Burn, downstream of the reservoir. This compensation flow has been in place since the construction and commissioning of the reservoir in the mid-1930s. The compensation flow is formally established under the provisions of the Durham County Water Board Act 1920 and subsequent legislation.

This drought action will be secured through the application of a Drought Permit. Table 2.1 summarises the key details of the compensation flow associated with Burnhope Reservoir, which ensures that the designated downstream flows are maintained in accordance with statutory requirements.

Table 2.1 NW public water supply abstraction licence details

Aspect	Detail
Licence Number	N.A. (Compensation flows established under statutory provisions rather than standard abstraction licensing regime)
Source Name	Burnhope Reservoir compensation discharge to Burnhope Burn Water Body
Statutory Basis	Durham County Water Board Act 1920 and subsequent legislation; Parliamentary provisions
Commencement Date	Circa 1936-1937 (coinciding with reservoir construction completion)
Daily Compensation Flow	9.09 MI/d
Location	Burnhope Burn, downstream of Burnhope Reservoir, Upper Weardale
Water body name & ID	Burnhope Burn from Source to Wear GB103024077430
Water body Classification	HMWB due to reservoir impoundment

2.2 Description of Drought Action

The Burnhope Reservoir drought action comprises a paired operational adjustment: temporarily halving the compensation flow from Burnhope Reservoir to Burnhope Burn from 9.09 MI/d to 4.55 MI/d, while concurrently increasing releases from the Tyne-Tees Tunnel (TTT) at Frosterley by 4.55 MI/d to maintain downstream flows in the River Wear. The daily licensed abstraction volume remains unchanged, only the compensation flow volume is modified.

The receiving water body, Burnhope Burn from Source to Wear (GB103024077430), is a headwater tributary of the River Wear. Flow reduction effects are concentrated within Burnhope Burn and the immediate downstream reaches of the River Wear. The TTT release at Frosterley (National Grid Reference NZ 01199 37133) occurs simultaneously with the reduced Burnhope compensation flow, limiting the zone of influence (Zoi) to approximately 20 km between Burnhope Reservoir and Frosterley. This paired operation does not occur under normal operating conditions.

Reducing the Burnhope Reservoir compensation flow conserves additional water for public supply. This Level 3a action requires a drought permit for implementation and would only be triggered during drought conditions. This is consistent with historical precedent, having been implemented only during the 1975, 1995, and 2003 droughts (with 1975 classified as a severe drought).

The impacts of the supply-side drought action of increased water transfers from River North Tyne through the TTT are covered in detail in the Kielder WFD report⁷.

⁷ Northumbrian Water (2026) NW Draft Drought Plan 2027 Water Framework Directive (WFD) Report - Kielder Reservoir Drought Action

3 WFD APPROACH AND METHODOLOGY

3.1 Methodology

The methodology for the WFD Compliance Assessment comprises the following:

Screening - A preliminary WFD assessment was completed at Stage 1, and all relevant information has been carried forward into this report. Any further screening of additional water bodies at this step is due to information that has subsequently become available from the EAR⁵.

Scoping - builds on the findings from the screening and applies specific risks to the identified activities. This step also details which WFD elements are at risk. The WFD quality elements are generally categorized into the following sub-sections:

1. Biological Elements - phytoplankton, phytobenthos, macrophytes, benthic invertebrates and fish
2. Hydromorphological Elements - connection to groundwater, quantity and dynamics of flow, river depth and width variation, structure and substrate of the riverbed, structure of the riparian zone
3. Physico-Chemical Elements - temperature, pH, dissolved oxygen, nutrients, salinity, acidification status and nutrient conditions
4. Chemical Elements - priority hazardous substances, priority substances, other pollutants.

This determines which WFD quality elements are being taken forward into the Impact Assessment.

Impact Assessment - The impact assessment draws on the findings from both previous steps to provide a detailed analysis of specific risks to WFD quality elements arising from the proposed activities. This includes making informed judgments based on the duration, magnitude, and overall significance of impact that the activity could cause. Following the identification and explanation of these risks, appropriate mitigation measures are outlined to avoid or minimise any adverse effects on the relevant WFD quality elements.

When proposals affect water bodies designated as HMWBs or AWBs, the assessment considers their consistency with the relevant Programme of Measures (PoMS) set out in the RBMP. This includes consideration of mitigation measures identified to support the achievement of GEP. More generally, the proposed drought action is assessed against the environmental objectives and PoMs applicable to all affected water bodies to determine whether it could hinder the delivery of planned measures or give rise to significant effects requiring additional mitigation. Assessment of the proposals against water body status objectives ensures compliance with the WFD, including the achievement of GES or GEP, as appropriate.

3.2 Study Area

For the purposes of this WFD Assessment, the Study Area encompasses:

- The Wear Carboniferous Limestone and Coal Measures Groundwater Body (GB40302G701600) that may be influenced by the Burnhope Reservoir drought action;
- The Burnhope Reservoir (GB30328742) and Burnhope Burn from Source to Wear Water Body (GB103024077430) including downstream reaches such as Wear from Wearhead to Middlehope Burn, Iresho Water Body (GB103024077440) and Wear from Middlehope Burn to Houselop Beck Water Body (GB103024077461) that could potentially be affected by changes in flow associated with the Burnhope Reservoir drought action; and,
- A 2 km buffer around scoped in water bodies to capture any designated sites which may be impacted by the Burnhope Reservoir drought action as they may be hydrologically or ecologically connected.

It should be noted that designated sites are identified as Protected Areas under the Water Framework Directive and must be considered in the assessment of WFD objectives. These include:

- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Ramsar sites
- Sites of Special Scientific Interest (SSSI)
- Shellfish waters
- Bathing waters
- Nutrient Sensitive Areas (NSA)
- Nitrate Vulnerable Zones (NVZ)
- Drinking Water Protected Areas.

3.3 Data Sources

The following data sources have been used to support this WFD Compliance Assessment:

- Catchment Data Explorer⁸
- MAGIC multi-agency mapping⁹
- Water Resources Planning Guideline¹⁰
- Environmental Assessment Guidance for WRMPs and Drought Plans (2021)¹¹

⁸ <https://environment.data.gov.uk/catchment-planning>

⁹ <https://magic.defra.gov.uk/MagicMap.html>

¹⁰ Environment Agency, Natural Resources Wales and The Water Services Regulation Authority (2023). *Water resources planning guideline*. Available at: <https://www.gov.uk/government/publications/water-resources-planning-guideline> [Accessed April 2026].

¹¹ UKWIR (2021). *Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans*. London: UK Water Industry Research. Available at: <https://ukwir.org/environmental-assessments-for-water-resources-planning> [Accessed April 2026].

- A practical guide to the Strategic Environmental Assessment Directive¹²
- Water Company Drought Plan Guideline¹³
- Water Resources Planning Guideline Supplementary Guidance¹⁴
- Environmental Assessment for Water Company Drought Planning: Guidance¹⁵.

¹² Office of the Deputy Prime Minister, Scottish Executive, Welsh Assembly Government, and Department of the Environment (Northern Ireland) (2005). A practical guide to the Strategic Environmental Assessment Directive. London: Office of the Deputy Prime Minister. Available at: <https://assets.publishing.service.gov.uk/media/5a78ec0740f0b62b22cbddd2/practicalguidesea.pdf> [Accessed April 2026].

¹³ Environment Agency and Department for Environment, Food and Rural Affairs (2025). Water company drought plan guidance, 2025. Available at: <https://www.gov.uk/government/publications/water-company-drought-plan-guideline-2025/water-company-drought-plan-guideline-2025> [Accessed April 2026].

¹⁴ Environment Agency (2023). Water resources planning guideline supplementary guidance – actions required to prevent deterioration. Available at: <https://www.gov.uk/government/publications/review-of-englands-emerging-regional-water-resources-plans/review-of-englands-emerging-regional-water-resources-plans> [Accessed April 2026].

¹⁵ Environment Agency (2025). Environmental assessment for water company drought planning: Guidance. Version 1.0. LIT 75033. Published 21 March 2025. Environment Agency, in collaboration with Defra and Natural England.

4 SUMMARY OF STAGE 1 WFD REPORT

4.1 Methodology

The Stage 1 WFD Report provided a preliminary WFD assessment undertaken as an initial step to identify the relevant drought actions and associated water bodies that could potentially be affected. As a high-level assessment, it was completed at a lower level of detail than the subsequent WFD Compliance Assessment and was used to screen out drought actions that were not considered to require further assessment. The assessment applied a screening and scoring methodology to distinguish between water bodies requiring detailed evaluation and those where impacts were beneficial, absent or limited to minor, localised, and short-term effects (Score 1). Only water bodies identified as having the potential for 'Medium' (Score 2) to 'High Impact' (Score 3) were taken forward to this WFD Compliance Assessment.

4.2 Assessment Findings

The Stage 1 Assessment concluded that the Burnhope Reservoir drought action could have a 'Medium' impact on the Burnhope Reservoir and Burnhope Burn from Source to Wear surface water bodies as well as the Wear Carboniferous Limestone and Coal Measures groundwater body.

Therefore, it has been determined that a detailed WFD Compliance Assessment is required for the Burnhope Reservoir drought action.

The Stage 1 preliminary WFD assessment was undertaken using high-level baseline information and did not incorporate the detailed hydrological modelling and pathway analysis subsequently provided by the EAR. This detailed WFD Compliance Assessment therefore refines the spatial extent of potential effects (see Study Area section). Consequently, additional downstream water bodies, including the River Wear from Wearhead to Middlehope Burn, Ireshope Burn, and the River Wear from Middlehope Burn to Houselop Beck, have been screened into this assessment.

5 SCREENING OF WATER BODIES

This section identifies and provides baseline information on all the relevant water bodies within the Study Area. These are:

- Burnhope Reservoir Water Body;
- Burnhope Burn from Source to Wear Water Body;
- Wear from Wearhead to Middlehope Burn, Iresho Water Body
- Wear from Middlehope Burn to Houselop Beck Water Body; and,
- Wear Carboniferous Limestone and Coal Measures Groundwater Body.

These water bodies have been evaluated against the Burnhope Reservoir drought action and have been screened in or out depending on the impacts.

5.1 Surface Water Bodies

5.1.1 Burnhope Reservoir Water Body

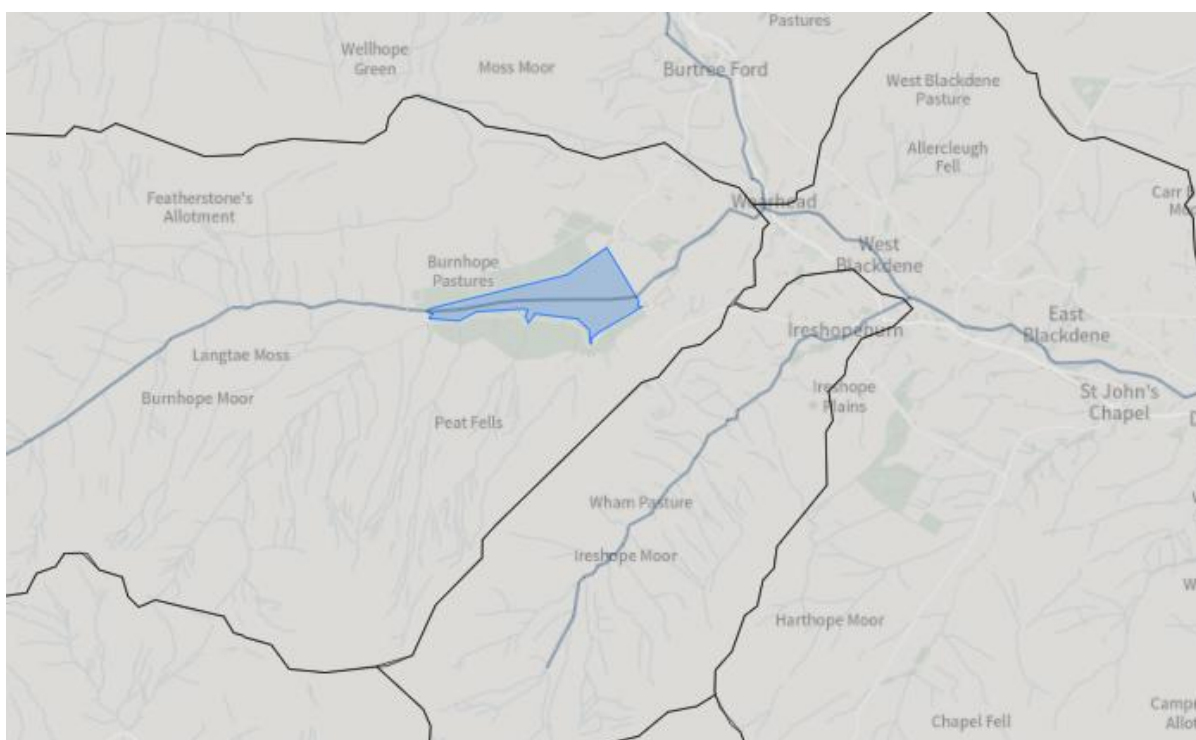


Figure 5.1 A map showing Burnhope Reservoir WFD Water Body (Source: Environment Agency Catchment Data Explorer)

The baseline data for the Burnhope Reservoir Water Body are shown in Table 5.1.

Table 5.1 Water body data for the Burnhope Reservoir WFD Water Body (source: Environment Agency Catchment Data Explorer)

Water body ID	GB30328742
Water body name	Burnhope Reservoir
NGR	NY8418738839
Catchment area (ha)	1839.25
Mean depth (m)	15
Hydromorphological designation	Heavily Modified
Current Ecological Status	Moderate
Ecological Status Objective	Good 2027
Reasons for not achieving good status	▪ Measure delivered to address reason, awaiting recovery – Mercury and Its Compounds ▪ Physical modification – Drinking water supply ▪ Measures delivered to address reason, awaiting recovery – Polybrominated diphenyl ethers (PBDE)
Protected area designation and list of protected areas	Burnhope Reservoir – Drinking Water Protected Area
Biological quality elements	High
Physico-chemical quality elements	Good
Specific pollutants	High
Supporting elements (surface water)	Moderate
Chemical status	Fail (2019) - Does not require assessment

The Burnhope Reservoir Water Body is screened in. This is because the drought action involves a direct operational change to the reservoir, namely a temporary reduction in the licenced compensation flow released downstream during drought conditions. As the source of the altered flow regime, Burnhope Reservoir forms an integral part of the impact pathway to downstream surface waters.

Although the reservoir itself is a Heavily Modified Water Body with limited biological sensitivity compared to downstream river reaches, the temporary change in compensation releases has the potential to influence hydrological conditions and supporting physico-chemical elements within the reservoir system during drought periods.

5.1.2 Burnhope Burn from Source to Wear Water Body

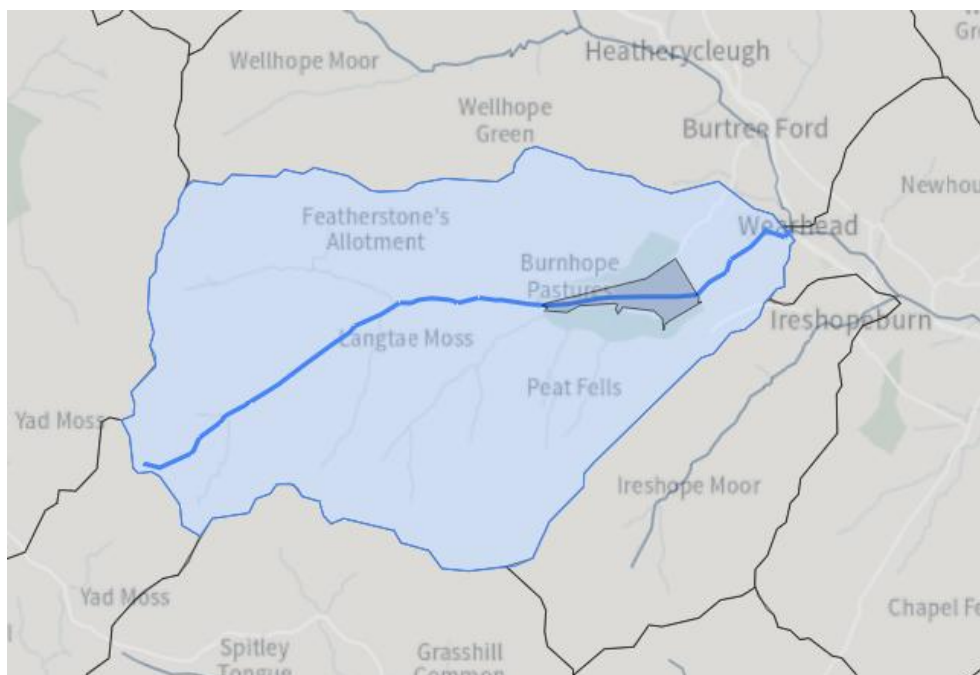


Figure 5.2 A map showing Burnhope Burn from Source to Wear WFD Water Body (Source: Environment Agency Catchment Data Explorer)

The baseline data for the Burnhope Burn from Source to Wear Water Body are shown in Table 5.2.

Table 5.2 Water body data for the Burnhope Burn from Source to Wear WFD Water Body (Source: Environment Agency Catchment Data Explorer, Cycle 3)

Water body ID	GB103024077430
Water body name	Burnhope Burn from Source to Wear Water Body
NGR	NY8216738775
Catchment area (ha)	2096.58
Length (km)	8.227
Hydromorphological designation	Heavily Modified
Current Ecological Status	Moderate
Ecological Status Objective	Good - 2027
Reasons for not achieving good status	- Measures delivered to address reason, awaiting recovery - PBDE - Physical modification - Reservoir / Impoundment - non flow related - Fish - Flow - Regulating Reservoir Flow Regime - Fish - Physical modification - Drinking water supply - Measures delivered to address reason, awaiting recovery - Mercury and Its Compounds
Protected area designation and list of protected areas	- North Pennine Moors SPA - Moor House-Upper Teesdale SAC
Biological quality elements	Poor
Physico-chemical quality elements	High
Specific pollutants	High

NW DROUGHT PLAN 2027

WFD REPORT - BURNHOPE RESERVOIR DROUGHT ACTION

Supporting elements (surface water)	Moderate
Chemical status	Fail (2019) - Does not require assessment

The Burnhope Burn from Source to Wear Water Body is screened in as this water body is the primary receptor of the Burnhope Reservoir drought action, as it directly receives the reduced compensation flow during implementation of the drought action. For the purposes of this assessment, Burnhope Burn is considered only downstream of the reservoir outfall, where it forms part of the connected river system affected by changes in compensation flow. Upstream sections of Burnhope Burn are not influenced by the drought action and are therefore not considered.

The temporary reduction in compensation flow has the potential to alter the hydrological and geomorphological regime within the Burnhope Burn, leading to reduced flow magnitude and wetted channel extent. As a small, headwater water body, Burnhope Burn is inherently more sensitive to flow reductions, with limited capacity to buffer hydrological stress. The EAR identifies Burnhope Burn from Source to Wear as the water body most affected by the proposed drought action, with temporary flow reductions of up to 50% predicted immediately downstream of Burnhope Reservoir during implementation of the drought action. Screening has identified potential pathways for impacts on biological quality elements, particularly fish and benthic macroinvertebrates, through reduced habitat availability, reduced connectivity, and increased stress under low flow conditions. Supporting physico-chemical elements, including dissolved oxygen and temperature, may also be affected during warm, low flow periods.

5.1.3 Wear from Wearhead to Middlehope Burn, Iresho Water Body

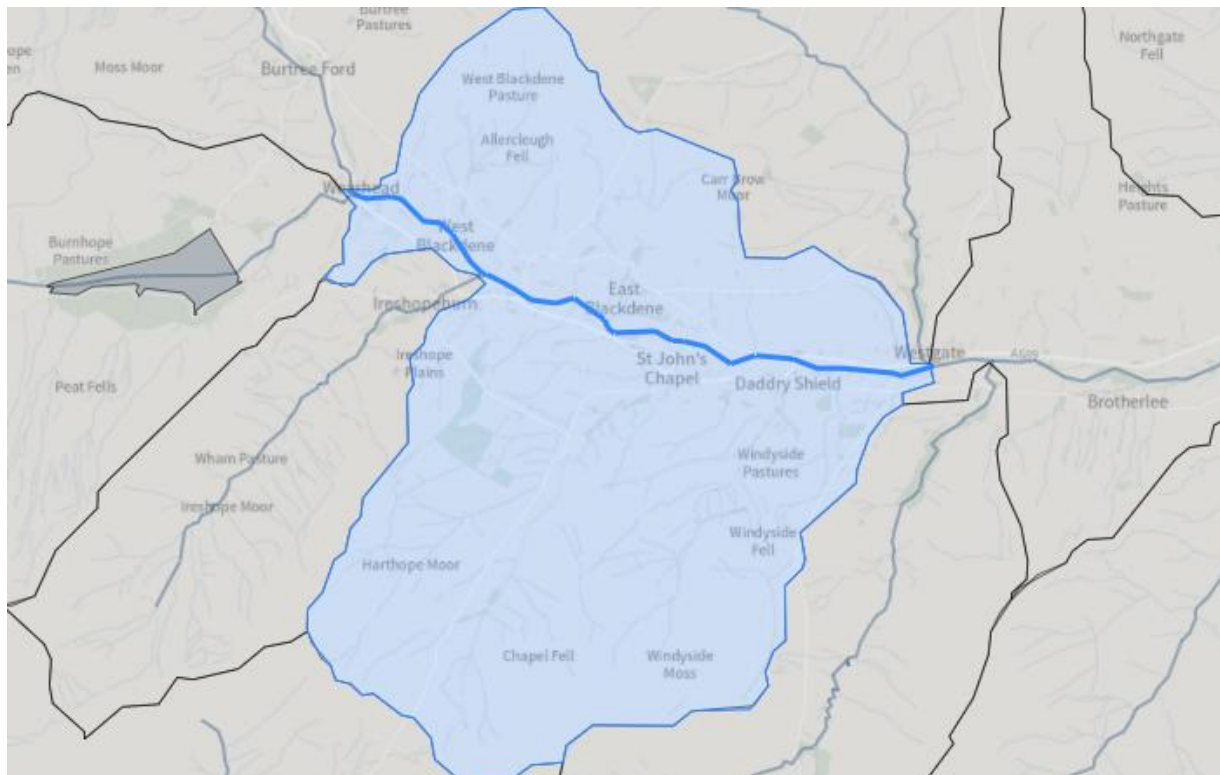


Figure 5.3 A map showing Wear from Wearhead to Middlehope Burn, Iresho WFD Water Body (Source: Environment Agency Catchment Data Explorer)

The baseline data for the Wearhead to Middlehope Burn, Iresho Water Body are shown in Table 5.3.

Table 5.3 Water body data for the Wear from Wearhead to Middlehope Burn, Iresho WFD Water Body (Source: Environment Agency Catchment Data Explorer, Cycle 3)

Water body ID	GB103024077440
Water body name	Wear from Wearhead to Middlehope Burn, Iresho Water Body
NGR	NY8808638274
Catchment area (ha)	2077.96
Length (km)	5.699
Hydromorphological designation	Heavily Modified
Current Ecological Status	Moderate
Ecological Status Objective	Good 2027
Reasons for not achieving good status	- Physical modification - Water regulation (i. ii.) - Unknown (pending investigation) - Invertebrates - Measures delivered to address reason, awaiting recovery - Mercury and Its Compounds - Point source - Abandoned mine - Lead and Its Compounds - Measures delivered to address reason, awaiting recovery - PBDE - Diffuse source - Abandoned mine - Lead and Its Compounds

	▪ Diffuse source - Abandoned mine - Zinc ▪ Unknown (pending investigation) - Cadmium and Its Compounds ▪ Point source - Abandoned mine - Zinc
Protected area designation and list of protected areas	▪ North Pennine Moors SPA ▪ Moor House-Upper Teesdale SAC
Biological quality elements	Moderate
Physico-chemical quality elements	High
Specific pollutants	Moderate
Supporting elements (surface water)	Moderate
Chemical status	Fail (2019) - Does not require assessment

The River Wear from Wearhead to Middlehope Burn, Iresho Water Body is screened in as a downstream receptor of the Burnhope Reservoir drought action. This water body may be affected by reduced compensation flows during implementation of the drought action.

EAR modelling indicates that temporary flow reductions of up to 50% may occur immediately downstream of Burnhope Reservoir (within the upstream Burnhope Burn from Source to Wear Water Body). Following the confluence of Burnhope Burn with the River Wear, the magnitude of flow reduction is reduced, with impacts within the Wear from Wearhead to Middlehope Burn, Ireshope Burn Water Body estimated to be in the order of 10–50% in the upper River Wear reaches upstream of Stanhope. These temporary reductions in flow have the potential to alter the hydrological and geomorphological regime within this reach of the River Wear, including reductions in flow magnitude and wetted channel extent, with hydraulic modelling indicating reductions in depth and velocity of the order of ~20% under representative flow conditions.

The upper River Wear in this reach is considered relatively sensitive to flow changes, where flows are strongly influenced by compensation releases and local hydrological inputs. As a result, proportional changes in flow during drought conditions can have a relatively greater influence on hydraulic conditions and habitat availability compared to larger, more buffered downstream reaches. Screening has identified potential impact pathways for biological quality elements, particularly fish and benthic macroinvertebrates, through reduced habitat availability, decreased longitudinal connectivity, and increased stress under low-flow conditions. Supporting physico-chemical elements, including dissolved oxygen and temperature, may also be affected during warm, low-flow periods.

5.1.4 Wear from Middlehope Burn to Houselop Beck Water Body

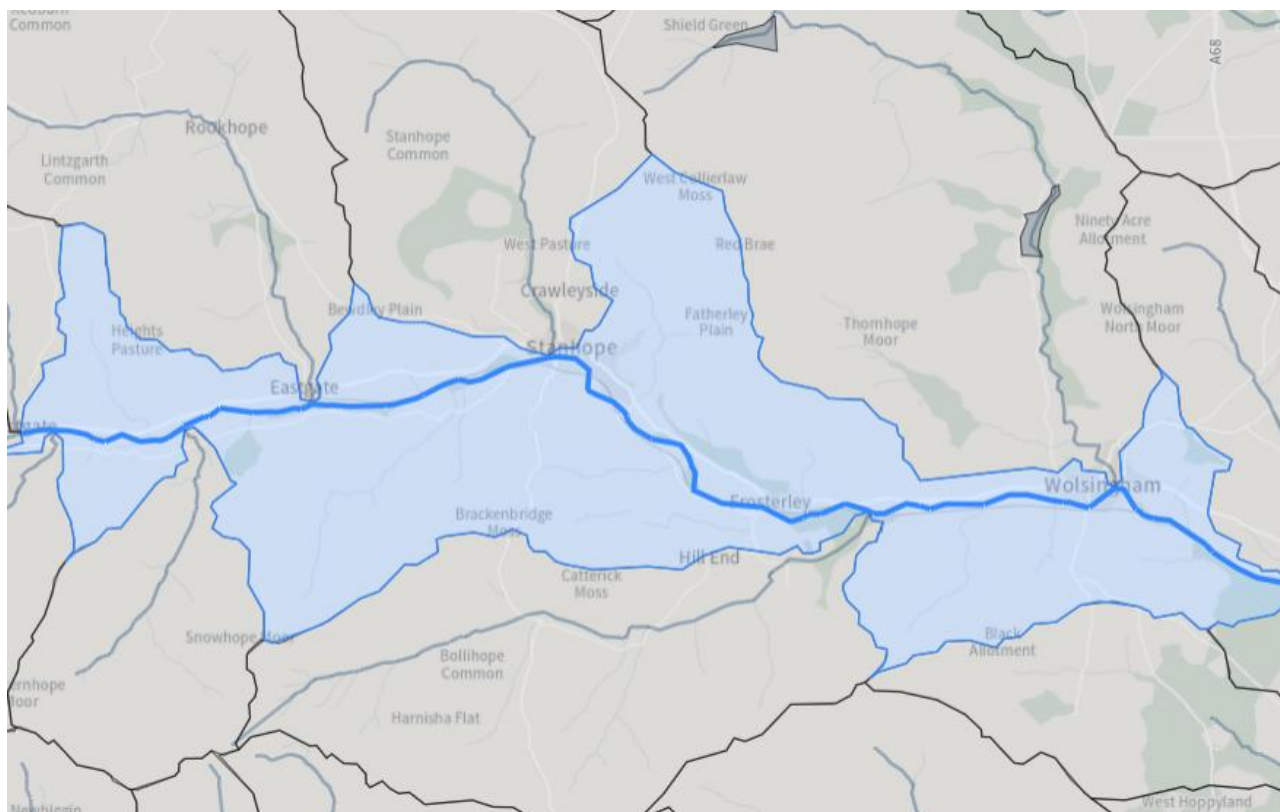


Figure 5.4 A map showing Wear from Middlehope Burn to Houselop Beck WFD Water Body (Source: Environment Agency Catchment Data Explorer)

The baseline data for the Wear from Middlehope Burn to Houselop Beck water body are shown in Table 5.4.

Table 5.4 Water body data for the Wear from Middlehope Burn to Houselop Beck WFD Water Body (Source: Environment Agency Catchment Data Explorer, Cycle 3)

Water body ID	GB103024077461
Water body name	Wear from Middlehope Burn to Houselop Beck Water Body
NGR	NZ0089937846
Catchment area (ha)	6411.85
Length (km)	22.97
Hydromorphological designation	Heavily Modified
Current Ecological Status	Moderate
Ecological Status Objective	Good 2027
Reasons for not achieving good status	- Measures delivered to address reason, awaiting recovery – PBDE - Point source - Abandoned mine – Zinc - Measures delivered to address reason, awaiting recovery – Mercury and Its Compounds - Physical modification - Water regulation (i. ii.) - Mitigation Measures Assessment
Protected area designation and list of protected areas	- North Pennine Moors SPA - North Pennine Moors SAC

NW DROUGHT PLAN 2027

WFD REPORT - BURNHOPE RESERVOIR DROUGHT ACTION

Biological quality elements	High
Physico-chemical quality elements	High
Specific pollutants	Moderate
Supporting elements (surface water)	Moderate
Chemical status	Fail (2019) - Does not require assessment

The Wear from Middlehope Burn to Houselop Beck Water Body is screened in as a downstream receptor of the Burnhope Reservoir drought action. This water body may be affected by reduced compensation flows during implementation of the drought measures.

Temporary flow reductions result in a 50% reduction in discharge immediately downstream of Burnhope Reservoir, however this magnitude of change is not maintained within this water body. Hydrological modelling indicates that flow reductions decrease progressively downstream as tributary inflows increase catchment yield, with reductions in this water body considered to fall within a lower proportional range (typically <15%, and below ~10% at Stanhope).

Compensatory releases at Frosterley from the TTT effectively offset the upstream reduction in compensation flow. As a result, changes in flow and water levels are largely mitigated downstream of the transfer point, with only negligible residual effects predicted beyond Frosterley.

While these temporary flow reductions have the potential to alter the hydrological and geomorphological regime within this reach of the River Wear, the magnitude of impact is expected to be lower than for Burnhope Burn and upper Wear reaches. This reflects attenuation of flow reductions downstream, and partial to near-complete compensation of flows by tributary inputs and TTT releases.

5.2 Groundwater Body

5.2.1 Wear Carboniferous Limestone and Coal Measures Water Body



Figure 5.5 A map showing the Wear Carboniferous Limestone and Coal Measures WFD Groundwater Body (Source: Environment Agency Catchment Data Explorer)

The baseline data for the Wear Carboniferous Limestone and Coal Measures Groundwater body are shown in Table 5.5.

Table 5.5 Water body data for the Wear Carboniferous Limestone and Coal Measures WFD Groundwater Body (Source: Environment Agency Catchment Data Explorer, Cycle 3)

Water body ID	GB40302G701600
Water body name	Wear Carboniferous Limestone and Coal Measures Water Body
NGR	NZ0779141099
Groundwater area (ha)	107295.138
Hydromorphological designation	Not applicable
Current overall status	Poor
Status objective (overall)	Poor 2015
Reasons for not achieving good status	- Point source - Abandoned mine - Chemical dependent surface water body status - Diffuse source - Abandoned mine - Chemical dependent surface water body status - Point source - Abandoned mine - General chemical test
Protected area designation and list of protected areas	- North Pennine Moors SPA - North Pennine Moors SAC - Lumley Park Burn from Herrington Burn to R Wear NVZ - Nitrates Directive - SKERNE NVZ - Nitrates Directive - Durham - Nitrates Directive - Moor House-Upper Teesdale - SAC - Valley Burn from Source to Wear NVZ - Nitrates Directive - Cong Burn from Twizell Burn to Wear NVZ - Nitrates Directive - Killerby Beck Catchment (trib of Tees) NVZ - Nitrates Directive - Smallhope Burn from Source to Browney NVZ - Nitrates Directive - Team from Source to Tyne - Nitrates Directive - Croxdale Beck from Source to Wear NVZ - Nitrates Directive - Wear Carboniferous Limestone and Coal Measures Drinking Water Protected Area - Pont Burn Catchment (tributary of Derwent) NVZ - Nitrates Directive
Quantitative (GW)	Good
Chemical (GW)	Poor

The Wear Carboniferous Limestone and Coal Measures groundwater body (GB40302G701600) was considered at Stage 1 screening due to potential surface water-groundwater connectivity. However, an assessment undertaken in the EAR indicates that the groundwater body is not sensitive to the Burnhope Reservoir drought action and is therefore screened out. Groundwater levels within this body are controlled by longer term seasonal to annual recharge processes driven by precipitation, rather than short term variations in compensation flows. The temporary reduction in surface water flows

associated with this drought action will not affect groundwater recharge, discharge patterns, or groundwater chemical or quantitative status.

6 SCOPING OF QUALITY ELEMENTS

This section presents the scoping of WFD quality elements for the relevant water bodies, which were screened in as potentially affected by the Burnhope Reservoir drought action. Quality elements are scoped in where reduced compensation flows during drought conditions could give rise to temporary changes in hydrology, habitat availability, sediment processes or supporting physico-chemical conditions.

For the purposes of this assessment, two receptor groups are defined: Burnhope Reservoir (Table 6.1), and the connected downstream river system (Table 6.2). The water bodies downstream until release from TTT at Frosterley include Burnhope Burn from Source to Wear downstream of the reservoir outfall, and the River Wear water bodies (Wear from Wearhead to Middlehope Burn, Ireshopeburn, and Wear from Middlehope Burn to Houselop Beck).

Table 6.1 WFD elements in Burnhope Reservoir Water Body (✓ = Scoped In, X = Scoped Out)

Quality Element	Description of Element	Scoped in / out	Justification
Biological	Macrophytes and phytobenthos: Composition and abundance	✓	Increased water retention and residence time within the reservoir, with potential for enhanced thermal stratification during warm periods may increase risk of eutrophication and algal blooms in summer, which could slightly affect macrophyte and phytobenthos composition and abundance.
	Benthic invertebrate fauna: Composition and abundance	✓	Water level fluctuations, localised changes in oxygen distribution, and potential algal blooms may cause slight habitat variation.
	Fish fauna: Composition, abundance and age	✓	Slight stratification, minor drawdown, and potential algal blooms may temporarily influence habitat conditions.
Hydro - morphological	Hydrological regime	✓	Temporary operational change to reduced reservoir outflows and increased storage; assessed to confirm no deterioration of ecological potential.
	Quantity and dynamics of water flow	✓	Directly affected by operational change to outflow volumes and retention time due to modified compensation releases.
	Connection to groundwater bodies	X	No change to recharge or groundwater interaction pathways.

Quality Element	Description of Element	Scoped in / out	Justification
	River continuity	X	No barriers or continuity issues introduced by this drought action.
	Morphological conditions	X	Reservoir morphology unchanged by operational change.
	River depth and width variation	X	Not applicable to reservoir environment.
	Structure and substrate of the riverbed	X	Not sensitive to temporary operational changes.
	Structure of the riparian zone	X	No interaction with riparian structure.
Physico-chemical Quality	Thermal conditions	✓	Temporary changes in retention time considered at screening level.
	Oxygenation conditions	✓	Supporting element assessed to demonstrate no deterioration.
	pH	X	No credible impact pathway identified.
	Acidification status	X	No relevant pressure associated with this drought action.
	Nutrient conditions	X	No change in nutrient inputs or concentrations anticipated.
Chemical	Risk of Pollution	X	No new pollution sources introduced.

Table 6.2 WFD elements in water bodies downstream until release from TTT at Frosterley (✓ = Scoped In, X = Scoped Out)

Quality Element	Description of Element	Scoped in / out	Justification
Biological	Macrophytes and phytobenthos: Composition and abundance	✓	Moderately sensitive to changes in flow and residence time; potential for short-term variation in habitat conditions, with suitable water quality maintained and recovery expected.
	Benthic invertebrate fauna: Composition and abundance	✓	Sensitive to reduced flows, habitat availability and sediment deposition.
	Fish fauna: Composition, abundance and age	✓	Highly flow-dependent; potential stress under low-flow conditions.
Hydromorphological	Hydrological regime	✓	Directly affected by reduced compensation flows.

Quality Element	Description of Element	Scoped in / out	Justification
	Quantity and dynamics of water flow	✓	Primary mechanism of impact during this drought action.
	Connection to groundwater bodies	✗	No evidence of groundwater-driven sensitivity.
	River continuity	✓	Reduced flows may limit fish and eel movement.
	River depth and width variation	✓	Reduced wetted channel extent under low flows.
	Structure and substrate of the riverbed	✓	Fine sediment accumulation risk during low-flow periods.
	Structure of the riparian zone	✗	No direct interaction with riparian structure anticipated.
Physico-chemical Quality	Thermal conditions	✓	Increased sensitivity during warm, low-flow conditions.
	Oxygenation conditions	✓	Reduced reaeration and higher biological demand under low flows.
	pH	✗	No credible pathway for change identified.
	Acidification status	✗	No relevant pressure associated with this drought action.
	Nutrient conditions	✓	Reduced dilution capacity under low flows.
Chemical	Risk of Pollution	✗	No known changes to pollution inputs; scoped out.

7 ASSESSMENT OF IMPACTS

This section evaluates the potential environmental impacts associated with the Burnhope Reservoir drought action. The impacts are assessed in terms of the Burnhope Reservoir drought action's effects on biological, hydromorphological, and physico-chemical elements of the water environment, as well as implications for drinking water supply, water body resilience, and aquatic habitats. These include the upstream impact associated with increased water retention within Burnhope Reservoir (Table 7.1), as well as the downstream impact resulting from a reduction in compensation flow.

The downstream assessment (Table 7.2) considers the following water bodies: Burnhope Burn from Source to Wear, the River Wear from Wearhead to Middlehope Burn, Iresho Burn, and the River Wear from Middlehope Burn to Houselop Beck. These water bodies are included as the EAR concludes that downstream effects may extend as far as Frosterley, located approximately 20 km downstream of Burnhope Reservoir within the Wear from Middlehope Burn to Houselop Beck water body.

This assessment uses RBMP Cycle 3 data from the Catchment Data Explorer website⁸ as well as findings of the EAR. [Error! Bookmark not defined.](#) The assessment considers the impacts in terms of the individual quality elements scoped into the assessment in Section 6.

Table 7.1 Impact assessment for Burnhope Reservoir Water Body

Quality Element	Quality Element Impact	Mitigation / Control
Biological	Macrophytes and phytobenthos: Increased water retention and residence time associated with the reduced compensation flow may lead to reduced circulation, increased residence time and enhanced thermal stratification within the reservoir during warm periods. These conditions may slightly increase the likelihood of algal growth and eutrophication effects. However, modelling indicates that any changes are minor, remain within existing WFD class thresholds and are temporary and reversible with seasonal inflows, resulting in no lasting effect on macrophyte and phytobenthos composition.	Mitigation will include measures outlined in the EAR: - Implementation controlled through Northumbrian Water's Drought Plan Level 3a trigger framework - Action only implemented following review and approval by the Drought Management Group (DMG) - Weekly reservoir level and temperature monitoring - Trigger: thermal stratification >2°C thermocline - Effectiveness: water level and thermal regime recover within ~3 months
	Benthic invertebrate fauna: As identified in the EAR, reduced circulation, minor drawdown and slight stratification may lead to short-term and localised changes in habitat conditions. The impact is	

Quality Element	Quality Element Impact	Mitigation / Control
	assessed as negligible with high confidence, with recovery expected through seasonal inflows in the EAR. Fish fauna: Reduced circulation and potential thermal stratification associated with increased water retention resulting from the reduced compensation flow may lead to temporary changes in habitat conditions within the reservoir. Fish may exhibit short-term behavioural responses to these changes; however, impacts are assessed as minor, short-term and reversible, with recovery expected following seasonal inflows.	
Hydro-morphological	Hydrological regime: Burnhope Reservoir is classified as a Heavily Modified Water Body due to its function for drinking water supply, with associated Reasons for Not Achieving Good Status (RNAGs) identified. The drought action represents a temporary operational change to reservoir outflow, namely a reduction in compensation releases during Level 3a drought conditions. This measure does not alter abstraction volumes or the fundamental function of the reservoir. Any changes to the hydrological regime are temporary and reversible, and no deterioration in ecological potential is anticipated.	Mitigation will include measures outlined in the EAR: ▪ Implementation controlled through Northumbrian Water's Drought Plan Level 3a trigger framework ▪ Action only implemented following review and approval by the DMG ▪ Baseline environmental monitoring data reviewed prior to implementation in consultation with the Environment Agency (EA) ▪ Action may be modified or ceased if monitoring indicates unacceptable environmental effects ▪ Full restoration of compensation flows following cessation of drought action
	Quantity and dynamics of water flow: The drought action reduces compensation flow volumes during drought conditions. The overall abstraction from the reservoir remains unchanged. No long-term effect on reservoir water levels or flow dynamics is anticipated.	Mitigation will include measures outlined in the EAR: ▪ Continuous operational monitoring of reservoir levels and releases during implementation ▪ Action is temporary and reversible, with reservoir release restored to baseline conditions post-drought

NW DROUGHT PLAN 2027

WFD REPORT - BURNHOPE RESERVOIR DROUGHT ACTION

Quality Element	Quality Element Impact	Mitigation / Control
		Implementation subject to ongoing review by DMG and environmental regulators
Physico-chemical	Thermal conditions: RBMP Cycle 3 classified the temperature element at Burnhope Reservoir as High. The drought action may result in minor changes in residence time and stratification during drought conditions, with potential for slight temperature variation. An exceedance of WFD thresholds is not anticipated (as outlined in the Burnhope Reservoir EAR).	Mitigation will include measures outlined in the EAR: - Weekly reservoir level and temperature monitoring - Trigger: thermal stratification >2°C thermocline - Effectiveness: water level and thermal regime recover within ~3 months - Subject to review of environmental indicators before and during operation - Action can be halted or adjusted if monitoring indicates potential adverse effects - Short duration of the drought action limits potential for temperature changes
	Oxygenation conditions: RBMP Cycle 3 classified dissolved oxygen element at Burnhope Reservoir as High. Reduced compensation flows may influence in-reservoir processes, including reduced mixing and increased residence time, with potential implications for oxygen dynamics. However, given the overall good water quality, no deterioration of supporting elements is predicted.	Mitigation will include measures outlined in the EAR: - Implementation subject to ongoing review by DMG and environmental regulators Subject to review of environmental indicators before and during operation - Action can be halted or adjusted if monitoring indicates potential adverse effects

Table 7.2 Impact assessment for water bodies until release from TTT at Frosterley

Quality Element	Quality Element Impact	Mitigation / Control
Biological	Fish fauna: Fish status in Burnhope Burn from Source to Wear is currently classified as Poor, with RNAG status including flow regulation and physical modification associated with reservoir operation (RBMP Cycle 3). Fish species include Atlantic salmon,	Mitigation will include measures outlined in the EAR: Avoid implementation during sensitive periods: Nov.–Jan. (spawning) and March–May (fry emergence)

Quality Element	Quality Element Impact	Mitigation / Control
	European eel, lamprey species and bullhead (EAR). As identified in the EAR, the drought action will result in a short- to medium-term reduction in habitat availability, thermal stress and impaired spawning conditions, particularly within Burnhope Burn, where flow reduction is greatest. These impacts are assessed as moderate (high confidence for salmonids; medium for eel, lamprey and bullhead), with recovery expected within 1–2 years. In Wear from Wearhead to Middlehope Burn and Wear from Middlehope Burn to Houselop Beck, impacts are reduced due to flow attenuation and TTT compensation and are considered minor to moderate and short-term. Overall, impacts are temporary and reversible, with no long-term deterioration in WFD fish status anticipated.	▪ Preferred implementation window: July–October ▪ Undertake pre-drought habitat walkovers to identify spawning gravels and fry distribution ▪ Implement weekly visual Fish-in-distress-walkover observations, increasing to daily if trigger thresholds are exceeded ▪ Apply adaptive management triggers, including: water temperature >20°C for >5 days / DO <6 mg/l / fish distress or mortality (e.g. >5 dead fish per site) ▪ Enable early withdrawal of the drought action if thresholds are triggered ▪ Where required, implement freshets (short-term flow increases) to support migration and flush sediments ▪ Post-drought monitoring at 6, 12 and 24 months, with recovery targets ≥80% of baseline populations ▪ Compensation: If recovery is incomplete post-drought, habitat enhancement measures (e.g. gravel cleaning, pool creation) are implemented
	Benthic invertebrate fauna: Benthic invertebrate communities are currently supported by good water quality conditions (RBMP Cycle 3). As identified in the EAR, the drought action may result in a short-term reduction in flow and riffle habitat, particularly in Burnhope Burn, leading to a temporary reduction in sensitive taxa. In Wear	Mitigation will include measures outlined in the EAR: ▪ Undertake quarterly macroinvertebrate sampling using WHPT / LIFE indices¹⁶ ▪ Apply enhanced monitoring if WHPT falls below Good status for >2 samples

¹⁶ The WHPT (Whalley, Hawkes, Paisley & Trigg) and LIFE (Lotic-invertebrate Index for Flow Evaluation) metrics are well-established macroinvertebrate-based indices used to assess river water quality and the effects of environmental pressures.

Quality Element	Quality Element Impact	Mitigation / Control
	from Wearhead to Middlehope Burn and Wear from Middlehope Burn to Houselop Beck, impacts are reduced due to attenuation and TTT compensation, and are expected to be minor. Overall, the EAR assesses impacts as minor, short-term and reversible (6–12 months), with recovery expected through drift and recolonisation, and no deterioration in WFD status anticipated.	- Use adaptive management triggers linked to index decline - Expect rapid natural recovery (6–12 months) following restoration of flows - Monitoring results used to inform early withdrawal decisions if required
	Macrophytes and phytobenthos: Macrophytes and phytobenthos within these water bodies are assigned as high (RBMP Cycle 3). As identified in the EAR, reduced flows may influence local habitat availability and water quality (e.g. minor temperature increase and reduced dilution), particularly within Burnhope Burn. Impacts are expected to be short-term, limited and minor, with suitable conditions maintained for these elements. Within Wear from Wearhead to Middlehope Burn and Wear from Middlehope Burn to Houselop Beck, effects are further reduced due to attenuation and TTT compensation, and are considered negligible to minor. Overall, the EAR concludes that impacts are minor, temporary and reversible, with no deterioration in WFD status anticipated.	Mitigation will include measures outlined in the EAR: - Monitor via WFD protocols (LEAFPACS¹⁷, TDI) - Effectiveness: indices remain ≥ good status.
Hydro-morphological	Hydrological regime: All three water bodies are classified as Heavily Modified. This drought action will cause a temporary alteration to the hydrological regime, limited to drought periods and implemented only as a last resort Level 3a measure. The action does not introduce new modifications and will not permanently alter hydrological processes or compromise ecological potential objectives. Quantity and dynamics of water flow:	Mitigation will include measures outlined in the EAR: - Action implemented only as Level 3a drought measure following trigger thresholds and DMG approval - Continuous flow monitoring and review during implementation - Use of TTT compensatory transfer (4.55 Ml/d) to offset downstream impacts below Frosterley

¹⁷ EA river macrophyte assessment tool

Quality Element	Quality Element Impact	Mitigation / Control
	The drought action will result in a temporary reduction in flow magnitude immediately downstream of Burnhope Reservoir, with impacts progressively diminishing downstream to less than 10% by Stanhope of up to 50% downstream of Burnhope Reservoir. Hydrological modelling presented in the EAR demonstrates that these changes are short-term, spatially limited and reversible, with flows restored following cessation of the drought action. The magnitude and duration of change are not sufficient to result in deterioration of WFD status.	Ability to modify or cease the action immediately if environmental triggers are exceeded
	River continuity: Lower flows may temporarily reduce connectivity across shallow riffles in Burnhope Burn, potentially constraining fish movement during drought periods. These effects are short-term and reversible and do not represent a new or permanent barrier. No long-term deterioration of river continuity is expected.	Mitigation will include measures outlined in the EAR: - Avoid drought action during key migration and spawning periods - Maintain minimum habitat connectivity via controlled flows - Use freshets (short-term flow increases) to support migration - Implement walkover monitoring to detect connectivity issues and trigger adaptive response
	River depth and width variation: Temporary reductions in wetted channel width and depth may occur as a result of the reduced compensation flow from Burnhope Reservoir associated with the drought action, particularly in shallow sections of Burnhope Burn. These effects are temporary and localised, with no lasting alteration to channel dimensions.	Mitigation will include measures outlined in the EAR: - Implement monthly geomorphological monitoring and establish pre-drought baseline (photos, cross-sections, substrate surveys) - Trigger thresholds: >50% substrate smothering by fine sediment or critical habitat drying - Apply early withdrawal of drought action if thresholds exceeded - Implement gradual ramping of flows post-drought (over ~5–7
	Structure and substrate of the riverbed: Reduced velocities may promote fine sediment deposition and loss of riffle expression. Based on this, there is potential for localised erosion if system resilience is not re-	

Quality Element	Quality Element Impact	Mitigation / Control
	established following drought conditions. EAR evidence indicates that subsequent flow recovery will re-mobilise sediments, with no persistent change to substrate composition or habitat quality.	days) to avoid channel instability Post-drought monitoring for ≥12 months, including recovery after high flow events Compensation: If recovery is incomplete, active restoration measures will be applied (e.g. gravel augmentation, large wood)
Physico-chemical	Thermal conditions: Burnhope Burn and Wear from Wearhead to Houselop currently achieve High physico-chemical status (RBMP Cycle 3). The EAR indicates that reduced flows during drought action implementation may result in minor, short-term increases in water temperature, particularly during warm weather. However, modelling undertaken as part of the EAR demonstrates that temperature changes remain within acceptable limits, with no risk of WFD class deterioration.	Mitigation will include measures outlined in the EAR: - Apply trigger thresholds for temperature (>20°C for >5 days) - Increase monitoring frequency during drought (weekly / continuous) - Allow early cessation of drought action if thresholds exceeded - Rely on short duration of action to limit thermal effects
	Oxygenation conditions: Lower flows may reduce reaeration and increase biological oxygen demand during drought periods. EAR assessment confirms that dissolved oxygen (DO) concentrations remain within acceptable thresholds, and no deterioration of supporting elements is predicted.	Mitigation will include measures outlined in the EAR: - Continuous DO monitoring using sondes and weekly validation sampling - Trigger thresholds: DO <6–7 mg/l or <75% saturation - Deploy emergency aeration if thresholds approached - Enable early withdrawal of drought action if DO remains below thresholds - Validate against Streeter-Phelps / model predictions
	Nutrient conditions: Reduced dilution capacity may result in minor, temporary increases in nutrient concentrations during drought conditions. EAR evidence confirms no exceedance of WFD thresholds or long-term nutrient enrichment.	Mitigation will include measures outlined in the EAR: - Weekly monitoring during drought (vs monthly baseline) - Parameter-specific triggers: Ammonia >0.15 mg/l (75% of High/Good boundary) /BOD approaching 2.5 mg/l /

Quality Element	Quality Element Impact	Mitigation / Control
		Phosphate approaching 0.012 mg/l annual average - Compare field data with model predictions and baseline trends - Apply adaptive management and early withdrawal if thresholds approached - Continue standard EA WFD monitoring programme post-drought

7.1 Protected Areas

There are eight designated sites within 2 km of the Study Area with potential hydrological or functional connectivity to the Burnhope Reservoir drought action. These sites, along with their description of the reasons for designation are included in Table 7.3.

Table 7.3 Designated protected sites within or with hydrological / functional connection to Study Area

Site Name	Reason(s) for Designation
North Pennine Moors SPA	Classified under the Birds Directive for its internationally important upland habitats supporting breeding populations of Annex I bird species, including hen harrier, merlin and golden plover.
Moor House–Upper Teesdale SAC	Designated under the Habitats Directive for its extensive range of upland habitats, including blanket bogs, active raised bogs, calcareous grasslands and springs, and for supporting Annex I habitats and Annex II species.
North Pennine Dales Meadows SAC	Designated for species-rich hay meadows, including lowland hay meadows and upland hay meadows, which support a high diversity of flowering plants.
Upper Teesdale SSSI	Notified for its exceptional assemblage of arctic-alpine flora, limestone grasslands and associated geological and geomorphological features.
Moorhouse and Cross Fell SSSI	Designated for its extensive upland habitats, including blanket bog, heathland and grassland, and for supporting nationally important bird, plant and invertebrate communities.
Burnhope Reservoir – Drinking Water Protected Area	Designated under the Water Framework Directive as a Drinking Water Protected Area to safeguard raw water quality abstracted for public water supply and to ensure compliance with drinking water standards through the protection of the source and contributing catchment.

Burnhope Reservoir is designated as a Drinking Water Protected Area and has been considered as part of the WFD protected areas screening. The Burnhope Reservoir drought action involves a temporary reduction in compensation flows and does not involve any change to licensed abstraction volumes, abstraction points or raw water quality inputs. The protected area is therefore screened out of further detailed WFD assessment.

The EAR concludes that no likely significant effects or adverse impacts were identified on non-statutory and statutory designated sites. The Burnhope Reservoir drought action is a temporary measure involving a short term reduction in compensation flows and does not increase abstraction or alter long term hydrological regimes. The designated sites are predominantly upland, precipitation fed systems and are hydrologically disconnected from the affected watercourses. No credible hydrological or water quality pathways linking the Burnhope Reservoir drought action to the qualifying features of these sites were identified.

7.2 Invasive Non-Native Species

The potential for effects on Invasive Non-Native Species (INNS) has been considered with reference to the EAR and available baseline data. The presence of INNS within or near Burnhope Reservoir or the watercourses associated with the Burnhope Reservoir drought action is based on the EAR baseline review, which draws on multiple data sources including NBN Atlas¹⁸, local ecological records and survey data. The EAR identifies four INNS: Japanese knotweed (*Reynoutria japonica*), Himalayan balsam (*Impatiens glandulifera*), New Zealand mud snail (*Potamopyrgus antipodarum*), and invasive amphipods (*Crangonyx* spp.).

The Burnhope Reservoir drought action does not involve any construction activities or new infrastructure and does not introduce new hydrological connections between catchments beyond the operation of the existing TTT system. The EAR acknowledges that the TTT provides a potential pathway for species movement, however, this is an existing operational system with established controls, and identified INNS are already present within the receiving catchment. As such, there is no new pathway for the introduction of INNS associated with the drought action.

Any potential effects are expected to be minor and localised, with lower flows also limiting the transport and wider dispersal of plant fragments and propagules. Water quality modelling indicates that supporting conditions (e.g. dissolved oxygen) remain within acceptable ranges, reducing the likelihood of significant ecological shifts in favour of INNS. The short duration of the Burnhope Reservoir drought action further limits the potential for establishment or long-term dominance.

Mitigation is based on standard biosecurity measures, including adherence to Check, Clean, Dry protocols during monitoring activities, and the recording of INNS presence as part of baseline, in-drought and post-drought monitoring. Any significant increase in INNS

¹⁸ <https://records.nbnatlas.org>

distribution or abundance would be reported to the EA and managed through targeted control measures if required.

On this basis, no significant effects related to INNS are anticipated, and INNS do not represent a pathway for deterioration of WFD biological quality elements.

7.3 Assessment of the Proposed Drought Action Against the WFD Mitigation Measures

For water bodies designated as HMWBs or AWBs, the WFD Regulations place particular emphasis on the role of mitigation measures in determining GEP. Both Burnhope Reservoir, Burnhope Burn from Source to Wear and two Wear water bodies considered in this assessment are classified as heavily modified water bodies, with physical modification and operation for drinking water supply identified as reasons for designation. These water bodies are located within the Northumbria River Basin District and are subject to GEP objectives set out in the RBMP.

As part of the WFD compliance assessment, it is necessary to consider whether the Burnhope Reservoir drought action could support the delivery of relevant mitigation measures or, conversely, hinder their implementation. No water-body-specific mitigation measures have been identified for the Burnhope Reservoir, Burnhope Burn from Source to Wear or the two Wear water bodies considered in this assessment within the Study Area. However, the Northumbria RBMP¹⁹ provides a summary of measures applicable across the management unit (Table 7.4).

Table 7.4 Mitigation measures in the Northumbria RBMP and potential impacts of the Burnhope drought action

Mitigation Measure	Potential Impact on Mitigation Measure
Sustainable abstraction and flow management measures	The drought action is unlikely to have any impact, positive or negative, on this measure.
Establishment and review of sustainable flow objectives for HMWBs	The drought action involves a temporary reduction in compensation flow and therefore influences flow conditions within the affected water bodies. However, this change is short-term, reversible and implemented within the existing flow management framework, including compensatory releases via the TTT. As such, it does not alter or constrain the establishment or long-term review of sustainable flow objectives, and is therefore not expected to have a material impact on this measure.
Climate change adaptation and drought resilience measures	The drought action is unlikely to have any impact, positive or negative, on this measure.
Measures to improve river habitat and ecological recovery (generic)	The drought action may result in a temporary reduction in flows, which could influence habitat conditions in the short term. However, these changes are minor, short-term and reversible, with recovery expected following seasonal flow restoration. River habitat

¹⁹ <https://www.gov.uk/guidance/river-basin-management-plans-updated-2022-measures>

NW DROUGHT PLAN 2027

WFD REPORT - BURNHOPE RESERVOIR DROUGHT ACTION

	improvement and restoration measures are typically designed to be resilient to natural hydrological variability, including low-flow conditions, and therefore are not expected to be adversely affected. As such, the drought action is not anticipated to constrain the implementation or long-term effectiveness of these measures.
INNS prevention and control measures (supporting)	The drought action is unlikely to have any impact, positive or negative, on this measure.

8 CONCLUSION

This WFD assessment has been undertaken to support Northumbrian Water's Drought Plan 2027 (DP27) and to determine whether the Burnhope Reservoir drought action would affect the status or objectives of WFD water bodies and therefore require further assessment under Regulation 19 of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The Compliance with the key objectives against which the impacts of the Burnhope Reservoir drought action were assessed against in this assessment, have been summarised as part of concluding compliance with WFD Regulation, see Table 8.1.

The assessment considered the potential effects of temporarily reducing compensation flows from Burnhope Reservoir and the associated compensatory release via the Tyne–Tees Transfer (TTT) system. The assessment screened into detailed consideration the Burnhope Reservoir Water Body, Burnhope Burn from Source to Wear Water Body, Wear from Wearhead to Middlehope Burn, Ireshope Burn Water Body, and Wear from Middlehope Burn to Houselop Beck Water Body. The Wear Carboniferous Limestone and Coal Measures Groundwater Body was subsequently screened out following review of evidence presented in the Environmental Assessment Report (EAR), which demonstrated that the groundwater body is not sensitive to the proposed drought action and that no credible pathway exists for impacts on groundwater quantitative or chemical status.

The impact assessment indicates that the Burnhope Reservoir drought action may result in minor, short-term and localised changes to flow, habitat availability and supporting physico-chemical conditions, particularly within Burnhope Burn where reductions in compensation flow are greatest. However, the magnitude of these impacts reduces progressively downstream due to tributary inflows and is largely offset by the operation of the TTT, which maintains downstream flow conditions. Modelling and assessment presented in the EAR confirm that changes in water quality parameters, including dissolved oxygen, temperature and nutrients, remain within existing WFD classification thresholds. Biological responses are expected to be limited to temporary and localised effects, with recovery occurring through natural processes such as recolonisation, seasonal flow restoration and population resilience.

The assessment also considered WFD Protected Areas, designated sites and invasive non-native species. No adverse effects are predicted on Drinking Water Protected Areas or statutory and non-statutory designated sites, as no significant hydrological or water quality pathways were identified. Furthermore, the drought action does not involve construction activities, new infrastructure or the creation of new transfer pathways and therefore presents no significant risk of introducing or spreading invasive non-native species.

The assessment demonstrates that predicted effects are temporary, reversible and remain within the range of natural variability associated with drought conditions. In addition, the drought action is subject to a robust mitigation and monitoring framework, including defined

trigger thresholds, adaptive management measures, and the ability to modify or cease operation if adverse environmental effects are observed.

Accordingly, the proposed drought action complies with the environmental objectives of the WFD and can be screened out under Regulation 19. The assessment has demonstrated that there is no credible mechanism by which the Burnhope Reservoir drought action would cause deterioration in water body status, compromise progress towards Good Ecological Status or Good Ecological Potential, or prevent the achievement of WFD objectives.

Compliance with the key objectives against which the impacts of the Burnhope Reservoir drought action were assessed against in this assessment are outlined below in Table 8.1.

Table 8.1 Compliance of the Burnhope Reservoir drought action with the environmental objectives of the WFD

Environmental Objective	Summary of Assessment for the Drought Action	Compliance with the WFD Regulation
No changes affecting high status sites	No high-status features are present within the drought action baseline area and no deterioration of any quality elements has been identified	Yes
No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential	Assessment has determined that the proposals will not cause deterioration in the status of the water bodies or prevent any implementation of water bodies mitigation measures in the future	Yes
No changes which will permanently prevent or compromise the Environmental Objectives being met in other water bodies	There is no identifiable pathway by which the proposals could affect any other bodies of water within the River Basin District	Yes
No changes that will cause failure to meet good groundwater status or result in a deterioration of groundwater status	The work will not cause deterioration in the status of the one groundwater body in the study area	Yes
No changes that will progressively reduce pollution from priority substances and cease or phase out emissions, discharges and losses of priority hazardous substances	The assessment has determined that the proposals will not introduce new sources of pollution or increase emissions, discharges or losses of priority substances or priority hazardous substances and will not comprise the	Yes

NW DROUGHT PLAN 2027

WFD REPORT - BURNHOPE RESERVOIR DROUGHT ACTION

	achievements of chemical status objectives	
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