APPENDIX A5 – Environmental Monitoring & Mitigation Plan

A5.2 INTRODUCTION

This appendix sets out the environmental monitoring and mitigation requirements for each reach, as identified in *Appendix B – Environmental Receptors Report* of the Area-specific Environmental Assessment Report (EAR). It has been developed in support of Yorkshire Water's Draft Drought Plan 2027 and in accordance with the requirements outlined in Section 5 (Environmental Assessment, Monitoring and Mitigation) of the Drought Plan Guidance (DPG).

The overarching monitoring strategy, including general methods, timings, thresholds, and broader implementation considerations, is set out in the main Environmental Monitoring and Mitigation Plan (EMP). This appendix should therefore be read alongside the main EMP to ensure full understanding of the monitoring framework and its application.

For each reach, this appendix covers:

Baseline Monitoring: Describes the routine and targeted baseline monitoring proposed to ensure adequate collection and maintenance of baseline datasets to characterise environmental conditions under normal (non-drought) conditions. Establishing pre-drought reference conditions helps to define environmental sensitivity and supports impact assessments for those receptors likely to be impacted by drought permit/order implementation as well as reduce uncertainty through addressing any data gaps. Operational indicators such as rainfall, reservoir levels, river flows, and groundwater levels are included.

On-set and In-Drought Monitoring: Outlines monitoring that will be undertaken to understand the actual environmental impacts of implementing the drought permit/order. This covers both the pre-permit/order application during drought development and post-permit or order implementation stages. Monitoring during this phase informs understanding of both natural drought impacts and those associated with permit-driven abstraction changes, supporting decision-making around mitigation.

Post-Drought (recovery) Monitoring: Covers monitoring after the drought permit/order ceases to assess any residual environmental effects. Unless otherwise specified, monitoring reverts to baseline activities once operations return to the normal abstraction regime.

Mitigation Purpose and Approach: Describes proposed mitigation measures to avoid, reduce or mitigate any potential adverse environmental effects, structured across three temporal stages:

- *Pre-drought implementation*, including actions during non-drought periods to build resilience;
- *During drought implementation*, including both proactive and reactive mitigation; and,
- *Post-drought implementation*, including interventions to support or accelerate recovery.

The monitoring and mitigation measures presented here include reach-specific requirements and considerations, based on specific sensitivities of local receptors and the nature of potential impacts identified for each reach Appendix B of the associated Environmental Assessment Report.

A5.3 MONITORING & MITIGATION

A5.3.1 WHARFE 1

WFD Waterbody:

- River Wharfe from Barben Beck/ River Dibb to Hundwith Beck (GB104027064257)
- River Wharfe from Hundwith Beck to River Washburn (GB104027064258)
- River Wharfe from River Washburn to Collingham Beck (GB104027064254)
- River Wharfe from Collingham Beck to Tadcaster Weir (GB104027064255)
- River Wharfe from Tadcaster Weir to River Ouse (GB104027064256)

Relevant Drought Option(s):

River Wharfe at Lobwood

Mitigation Triggers – Relevant Water Quality Thresholds appropriate to WFD river type:

- Moderate-Poor status thresholds for upland and low alkalinity rivers (less than 64% dissolved oxygen saturation; in excess of 1.1mg/l total ammonia)
- Additional unionised ammonia threshold of 40µg/l further to WFD requirements

Sensitive Receptors and Impact Assessment:

Table A5-1 Summary of Impact Assessment for Wharfe 1

Reach	Wharfe 1	
	Significance of Impact	**Mitigation Required** *(Y/N)*
Statutory designated sites/Local wildlife sites		
River Wharfe, Otley & Mid Wharfedale/Wetherby LWS	Minor	No
Ben Rhydding Gravel Pits LWS	Negligible	No
Otley Sand and Gravel Pits LWS	Negligible	No
NERC and Notable Species Receptors		
Otter (*Lutra lutra)*	Negligible	No
Water vole (*Arvicola amphibious)*	Moderate	Yes
Fine-lined pea mussel (*Pisidium tenuilineatum)*	Negligible	No
Atlantic salmon (*Salmo salar)*	Moderate	Yes
Brown trout (*Salmo trutta)*	Moderate	Yes
European eel (*Anguilla anguilla)*	Minor	No
River lamprey (*Lampetra fluviatilis)*	Moderate	Yes
Brook lamprey (*Lampetra planeri)*	Moderate	Yes
Barbel (*Barbus barbus)*	Minor	No
Bullhead (*Cottus gobio)*	Minor	No
Grayling (*Thymallus thymallus)*	Moderate	Yes
WFD Status Receptors		
GB104027064257 River Wharfe from Barben Beck/ River Dibb to Hundwith Beck GB104027064258 River Wharfe from Hundwith Beck to River Washburn GB104027064254 River Wharfe from River Washburn to Collingham Beck GB104027064255 River Wharfe from Collingham Beck to Tadcaster Weir GB104027064256 River Wharfe from Tadcaster Weir to River Ouse		
Fish	Moderate	Yes
Invertebrates	Moderate	Yes

Figure A5-1 Map of Impacted Reach for Wharfe 1

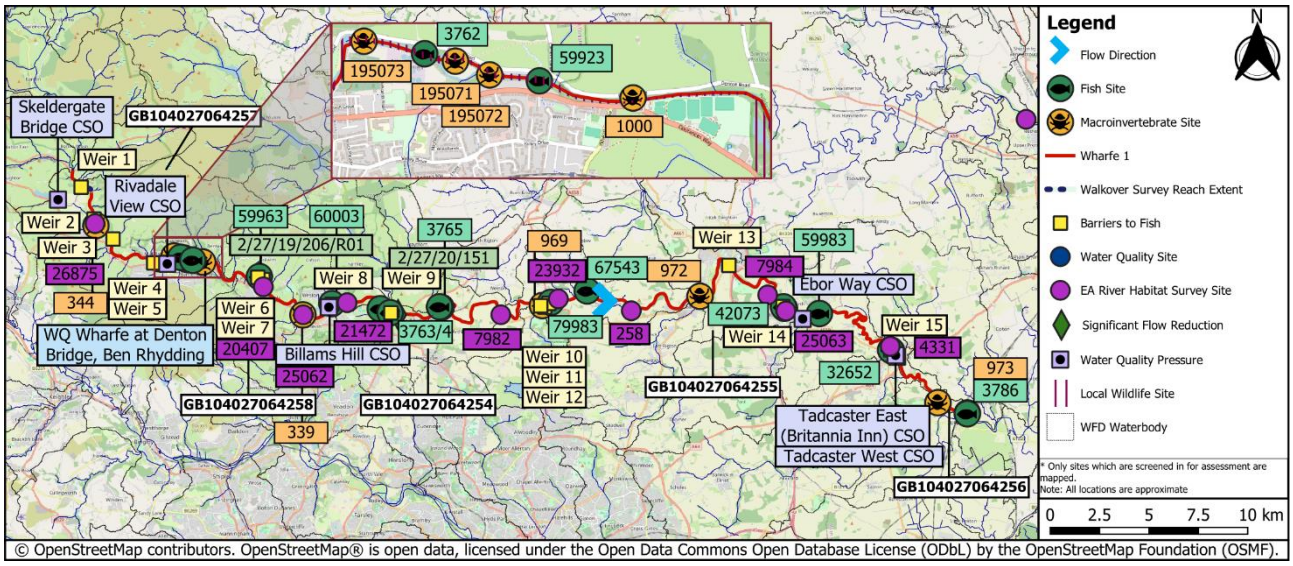

Table A5-2 Summary of Monitoring Recommendations at Each Stage of Drought for Wharfe 1

Code	Description	Measure Included?
Baseline Monitoring		
BMON_H	Routine flow/levels	✓
BMON_WQ	Routine WQ	✓
BMON_E1	Macroinvertebrate	✓
BMON_E2	Fisheries	✓
BMON_E3	Habitat Walkover mapping	✓
On-set of Environmental drought		
ODMON_WS	River condition walkover survey	Site 1: 500m located within SE0755051963 to SE08045182
In-Drought (during drought option implementation)		
IDMON_WSE	Surveillance walkover (habitat quality and ecological stress)	Site 1: 500m located within SE0755051963 to SE08045182
IDMON_WSWQ1	Surveillance walkover (water quality and ecological stress)	x
IDMON_WSWQ2	CSO monitoring	Ebor Way/CSO [WA 5855] at SE4407045290 Tadcaster West CSO at SE4884843374 Tadcaster East (Britannia Inn) CSO at SE4877043450 Wyvill Road CSO [QC.27/19/0025] at SE1340248106 Billams Hill/CSO [WADC717] at SE2009945880 Rivadale View CSO [3166(SS)] at SE1192448068
Post-Drought (Drought Options Removed)		
PDMON_E1	Macroinvertebrate	✓
PDMON_E2	Fisheries	✓

Table A5-3 Summary of Mitigation Recommendations at Each Stage of Drought for Wharfe 1

Code	Description	Measure Included?
In–Drought (During Drought Option Implementation)		
IDMIT_H1	Third-party abstraction	Electricity Production at SE1655047390 Paper and Printing at SE236455
IDMIT_H2	Temporary cessation for SSSI's	x
IDMIT_WQ1	Improving the effluent quality	x
IDMIT_WQ2	Short–term relaxation of drought permit flow reduction	✓
IDMIT_E1	Gradual or temporary adjustments to abstraction or compensation flows	✓
IDMIT_E2	Aeration of watercourse	✓
IDMIT_E3	Refuges	✓
IDMIT_E4	In-stream structures	✓
IDMIT_E5	Inspection and clearing of screens	✓
IDMIT_E6	Fish/crayfish rescue and relocate	✓
Post–Drought (Drought Options Removed)		
PDMIT_E1	Habitat enhancement	✓
PDMIT_E2	Freshets	x
PDMIT_E3	Barrier modification	✓
PDMIT_E4	Coarse fish restocking	✓

A5.3.2 OUSE 1

WFD Waterbody:

River Ouse from River Nidd to Stillingfleet Beck (GB104027069593)

Relevant Drought Option(s):

River Ouse at Monkton

Mitigation Triggers – Relevant Water Quality Thresholds appropriate to WFD river type:

- Moderate-Poor status thresholds for upland and low alkalinity rivers (less than 64% dissolved oxygen saturation; in excess of 0.75mg/l total ammonia)
- Additional unionised ammonia threshold of 40µg/l further to WFD requirements

Sensitive Receptors and Impact Assessment:

Table A5-4 Summary of Impact Assessment for Ouse 1 and Ouse 1 Cumulative

Reach	Ouse 1	Ouse 1 Cumulative	Mitigation
	Significance of Impact[1]	Significance of Impact[2]	(Y/N)
Designated Sites			
Naburn Marsh SSSI	Negligible	Negligible	No
Clifton Ings and Rawcliffe Meadows SSSI	Negligible	Negligible	No
Church Ings SSSI	Negligible	Negligible	No
Acaster South Ings SSSI	Negligible	Negligible	No
Fulford Ings SSSI	Negligible	Negligible	No
NERC Habitats and Local Wildlife Sites			
River Ouse LWS	Minor	Minor	No
Bishopthorpe Ings LWS	Negligible	Negligible	No
Gollie Ponds LWS	Minor	Minor	No
Middlethorpe Crematorium LWS (4-3)	Negligible	Negligible	No
Naburn Hall Meadow / Ings LWS	Negligible	Negligible	No
Clifton Ings LWS	Negligible	Negligible	No
Rawcliffe Ings Dyke LWS	Negligible	Negligible	No
NERC and Notable Species Receptors			
Tansy Beetle *(Chrysolina graminis)*	Negligible	Negligible	No
Oreodytes davisii	Minor	Minor	No
Potamophylax rotundipennis	Minor	Minor	No
Nigrobaetis niger	Minor	Minor	No
Rhyacophila septentrionis	Minor	Minor	No
Sialis nigripes	Minor	Minor	No
Water vole (*Arvicola amphibious)*	Negligible	Negligible	No
Otter (*Lutra lutra)*	Negligible	Negligible	No
Atlantic salmon (*Salmo salar)*	Negligible	Negligible	No
Brown trout (*Salmo trutta)*	Negligible	Negligible	No
Brook lamprey (*Lampetra planeri)*	Minor	Minor	No
European eel (*Anguilla anguilla)*	Negligible	Negligible	No
Sea lamprey (*Petromyzon marinus*)	Moderate	Moderate	Yes
Barbel (*Barbus barbus)*	Negligible	Negligible	No
River lamprey (*Lampetra fluviatilis)*	Moderate	Moderate	Yes
Bullhead (*Cottus gobio)*	Negligible	Negligible	No
Grayling (*Thymallus thymallus)*	Negligible	Negligible	No
WFD Status Receptors - GB104027069593 Ouse from River Nidd to Stillingfleet Beck			
Fish	Minor	Minor	No
Invertebrates	Minor	Minor	No

[1] Risk of Deterioration for WFD receptors

Figure A5-2 Map of Impacted Reach for Ouse 1

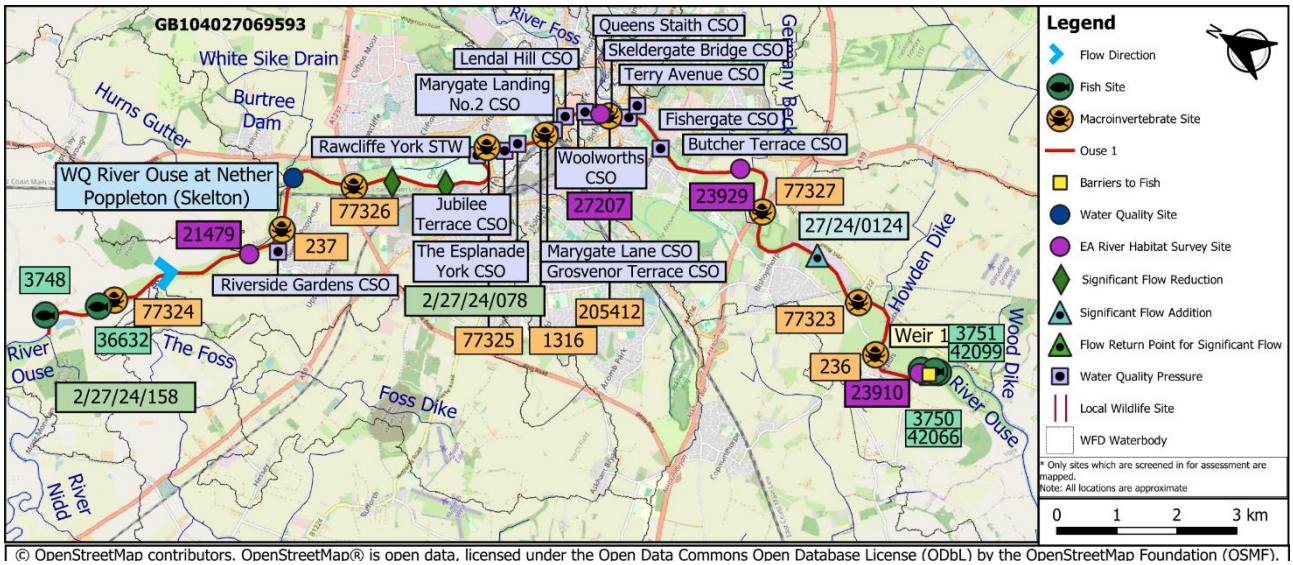

Table A5-5 Summary of Monitoring Recommendations at Each Stage of Drought for Ouse 1 & Ouse 1 Cumulative

Code	Description	Measure Included?
Baseline Monitoring		
BMON_H	Routine flow/levels	✓
BMON_WQ	Routine WQ	✓
BMON_E1	Macroinvertebrate	✓
BMON_E2	Fisheries	✓
BMON_E3	Habitat Walkover mapping	✓
On-set of Environmental drought		
ODMON_WS	River condition walkover survey	Site 1: 500m located within SE56535532 to SE57035525
In-Drought (during drought option implementation)		
IDMON_WSE	Surveillance walkover (habitat quality and ecological stress)	Site 1: 500m located within SE56535532 to SE57035525
IDMON_WSWQ1	Surveillance walkover (water quality and ecological stress)	x
IDMON_WSWQ2	CSO monitoring	Rawcliffe York STW [YWS01989] at SE686234 Riverside Gardens/CSO [27/24/0465] at SE5569654982 Jubilee Terrace CSO [C4958] at SE58995254 Grosvenor Terrace CSO [27/24/0452] at SE5997252840 Skeldergate Bridge CSO [27/24/0426] at SE6032851287 Terry Avenue CSO [27/24/0427] at SE6048351022 Trafalgar Street/CSO [1282] at SE6022750108 Fishergate/ CSO [27/24/0421] at SE60745451000 The Esplanade York CSO [27/24/0205] at SE59195240 Lendal Hill CSO [27/24/0417] at SE6001551986 Marygate Lane CSO [27/24/0449] at SE5973352285 Queens Staith CSO [27/24/0459] at SE6019251592 Marygate Landing CSO (No2) [C4957] at SE5974352059 Knavesmire Road/CSO [27/24/0437] at SE5926050438
Post-Drought (Drought Options Removed)		
PDMON_E1	Macroinvertebrate	✓
PDMON_E2	Fisheries	✓

Table A5-6 Summary of Mitigation Recommendations at Each Stage of Drought for Ouse 1

Code	Description	Measure Included?
In–Drought (During Drought Option Implementation)		
IDMIT_H1	Third-party abstraction	x
IDMIT_H2	Temporary cessation for SSSI's	x
IDMIT_WQ1	Improving the effluent quality	x
IDMIT_WQ2	Short–term relaxation of drought permit / order flow reduction	✓
IDMIT_E1	Gradual or temporary adjustments to abstraction or compensation flows	✓
IDMIT_E2	Aeration of watercourse	✓
IDMIT_E3	Refuges	x
IDMIT_E4	In-stream structures	x
IDMIT_E5	Inspection and clearing of screens	✓
IDMIT_E6	Fish/crayfish rescue and relocate	x
Post–Drought (Drought Options Removed)		
PDMIT_E1	Habitat enhancement	✓
PDMIT_E2	Freshets	x
PDMIT_E3	Barrier modification	✓
PDMIT_E4	Coarse fish restocking	x

A5.3.3 URE 1

WFD Waterbody:

- Ure from Thornton Steward Beck to River Skell (GB104027069461)

Relevant Drought Option(s):

River Ure At Kilgram Bridge

Mitigation Triggers – Relevant Water Quality Thresholds appropriate to WFD river type:

- Moderate-Poor status thresholds for upland and low alkalinity rivers (less than 64% dissolved oxygen saturation; in excess of 1.1mg/l total ammonia)
- Additional unionised ammonia threshold of 40µg/l further to WFD requirements

Sensitive Receptors and Impact Assessment:

Table A5-7 Summary of Impact Assessment for Ure 1

Reach	Ure 1	
	Significance of Impact[3]	**Mitigation Required** *(Y/N)*
NERC and Notable Species Receptors		
White-clawed crayfish (*Austropotamobius pallipes)*	Moderate	Yes
Atherix ibis	Minor	No
Unio tumidus	Minor	No
Riolus subviolaceus	Minor	No
Ephemerella notata	Minor	No
Otter (*Lutra lutra)*	Negligible	No
Water vole (*Arvicola amphibius*)	Moderate	Yes
Fine-lined pea mussel (*Pisidium tenuilineatum*)	Negligible	No
Atlantic salmon (*Salmo salar*)	Moderate	Yes
Brown trout (*Salmo trutta)*	Moderate	Yes
European eel (*Anguilla anguilla*)	Minor	No
River lamprey (*Lampetra fluviatilis*)	Moderate	Yes
Brook lamprey (*Lampetra planeri)*	Minor	No
Bullhead (*Cottus gobio)*	Minor	No
Grayling (*Thymallus thymallus)*	Minor	No
WFD Status Receptors- GB104027069461 Ure from Thornton Steward Beck to River Skell		
Fish	Minor	No
Invertebrates	Minor	No
Landscape, navigation, recreation and heritage receptors		
Angling	Minor	No

[3] Risk of Deterioration for WFD receptors

Figure A5-3 Map of Impacted Reach for Ure 1

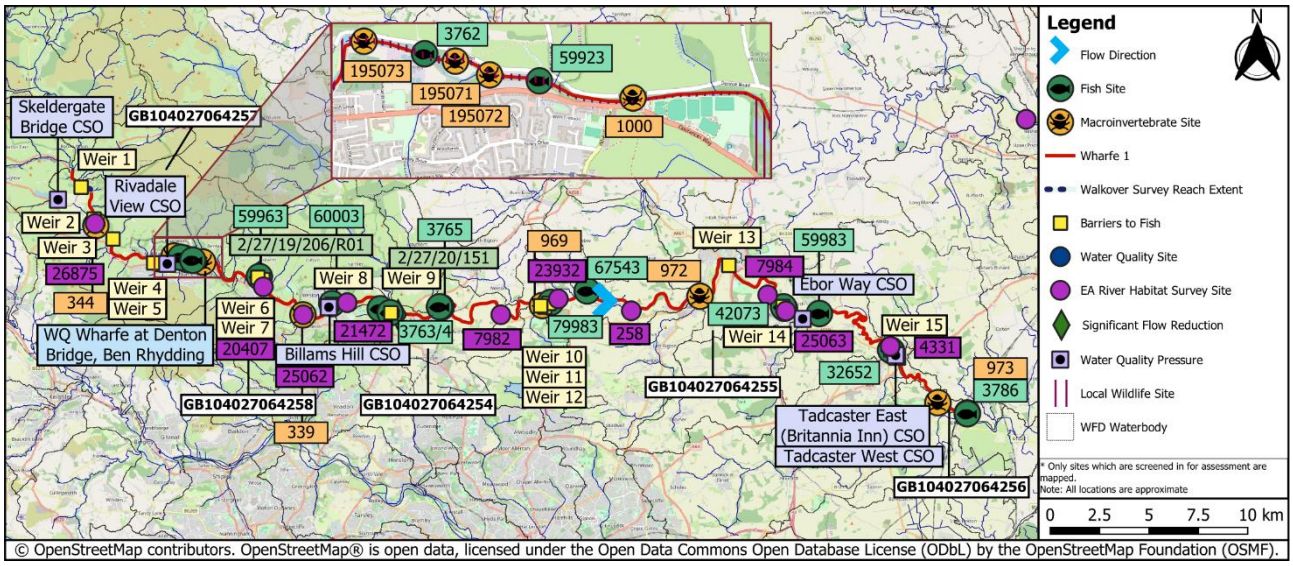

Table A5-8 Summary of Monitoring Recommendations at Each Stage of Drought for Ure 1

Code	Description	Measure Included?
Baseline Monitoring		
BMON_H	Routine flow/levels	✓
BMON_WQ	Routine WQ	✓
BMON_E1	Macroinvertebrate	✓
BMON_E2	Fisheries	✓
BMON_E3	Habitat Walkover mapping	✓
On-set of Environmental drought		
ODMON_WS	River condition walkover survey	Site 1: 500m located within SE0755051963 to SE08045182
In-Drought (during drought option implementation)		
IDMON_WSE	Surveillance walkover (habitat quality and ecological stress)	Site 1: 500m located within SE0755051963 to SE08045182
IDMON_WSWQ1	Surveillance walkover (water quality and ecological stress)	x
IDMON_WSWQ2	CSO monitoring	Leyburn Road CSO at SE2300080690 Millgate Masham CSO at SE2258081010 Silver Street CSO at SE2271580776
Post-Drought (Drought Options Removed)		
PDMON_E1	Macroinvertebrate	✓
PDMON_E2	Fisheries	✓

Table A5-9 Summary of Mitigation Recommendations at Each Stage of Drought for Wharfe 1

Code	Description	Measure Included?
In–Drought (During Drought Option Implementation)		
IDMIT_H1	Third-party abstraction	General Agriculture at SE23108067
IDMIT_H2	Temporary cessation for SSSI's	x
IDMIT_WQ1	Improving the effluent quality	x
IDMIT_WQ2	Short–term relaxation of drought permit flow reduction	✓
IDMIT_E1	Gradual or temporary adjustments to abstraction or compensation flows	✓
IDMIT_E2	Aeration of watercourse	✓
IDMIT_E3	Refuges	✓
IDMIT_E4	In-stream structures	✓
IDMIT_E5	Inspection and clearing of screens	✓
IDMIT_E6	Fish/crayfish rescue and relocate	✓
Post–Drought (Drought Options Removed)		
PDMIT_E1	Habitat enhancement	✓
PDMIT_E2	Freshets	x
PDMIT_E3	Barrier modification	✓
PDMIT_E4	Coarse fish restocking	x

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