

Appendix A.5

RIVER OPTION REACHES

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CUSTOMERS



WATER SUPPLY



ENVIRONMENT



TRANSPARENCY



BILLS



Reach Overview Sheet

Ure 1

WFD Waterbody:

Ure from Thornton Steward Beck to River Skell GB104027069461

Relevant Drought Option(s):

River Ure at Kilgram Bridge

Sensitive Features and Impact Assessment:

- Otter (Negligible)
- Water vole (Moderate)
- Fine-lined pea mussel (Moderate)
- Atlantic salmon (Moderate)
- Brown trout (Moderate)
- Bullhead (Moderate)
- European eel (Moderate)
- Grayling (Moderate)
- Barbel (Moderate)
- Brook lamprey (Moderate)
- River lamprey (Moderate)
- Fish (Moderate)
- Invertebrates (Moderate)
- Angling (Minor)

Significant Water Quality Pressures:

- Leyburn Road CSO SE2258081010
- Silver Street CSO SE2250280844
- Millgate Masham CSO SE2271580776

Mitigation Triggers – Relevant Water Quality Thresholds:

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

Baseline Monitoring

Baseline monitoring proposed to ensure an adequate baseline dataset exists to describe non-drought conditions for those receptors likely to be impacted by drought permit implementation and to fill any data gaps and reduce uncertainty identified during the environmental assessment.

Routine Baseline Monitoring:

- BMON_1 - EA/YWSL to continue monitor river flows and levels/reservoir levels and spill at key monitoring sites

- BMON_2 - EA to continue routine water quality monitoring at existing network of sites on current monthly programme, which includes those on un-impacted reaches suitable as control sites.
- BMON_3 - Macroinvertebrate monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare.
- BMON_4 - Fish monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare.

Targeted Baseline Monitoring:

- BMON_6 - Fine-lined pea mussel survey to determine distribution and abundance in reaches under serious hydrological stress.
- BMON_7 - Targeted juvenile lamprey surveys to identify distribution of habitat and an indicative population status within reaches subject to serious hydrological stress.

On-set of Environmental Drought- Monitoring

Subject to the availability of relevant data, the following walkover survey should be carried out prior to drought permit implementation

- ODMON_1 – Walkover surveys of habitat quality and identification of drought sensitive habitats such as areas of riffle, pools and artificial features such as weirs and sluices that may be isolated or impassable during low flows. Results to be captured by annotated walkover maps and completion of a 'River Conditions Observation Form - Low Flows' form.

Site 1: 500m located within SE23048096 to SE23228039

In-Drought (During drought option implementation) – Monitoring

In order to establish impacts and target mitigation the following surveillance walkover surveys should be completed during the drought option implementation (including on the day of the flow change, the day after and then weekly thereafter until no further changes are noted):

- IDMON_1 - Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems (reaches to match those in ODMON_1):

Site 1: 500m located within SE23048096 to SE23228039

- IDMON_2 - Targeted surveillance walkover surveys of water quality and ecological stress local to 'significant' water quality pressures', to include water quality spot sampling in priority areas such as pools and weirs where aquatic species may become isolated during low flows:
 - None
- IDMON_3 - Storm intensity forecasting to predict likely CSO spill events and the need for pre-emptive mitigation:
 - Leyburn Road CSO SE2258081010
 - Silver Street CSO SE2250280844
 - Millgate Masham CSO SE2271580776

In-Drought (During drought option implementation) – Mitigation

Mitigation which may be required during the drought option implementation.

- IDMIT_6 - Gradual phase-in of reduction in water volume/flow to avoid stranding of individuals (fish, white-clawed crayfish, fine-lined pea mussel)
- IDMIT_8 - Temporary reduction in volume of abstraction or increase in compensation release (fish)

- IDMIT_10 - Creation of alternative refuges in deeper water where walkover surveys identify the loss of important deep water habitat or high densities of fauna in refuges (fish, white-clawed crayfish, water vole)
- IDMIT_11 - Provision of in-stream structures and flow baffles to create functional refuges to support flow sensitive species where walkover surveys identify a projected loss of habitat inundation (macroinvertebrates, fish, white-clawed crayfish, water vole, otter)
- IDMIT_13 - Provision of piscivorous “visual” bird scaring measures (e.g. using streamers in riparian trees) to control predation upon species using refuges (fish). These visual measures would only be implemented following consultation with the EA, Natural England and bird specialists, particularly taking account of protected species under the Wildlife and Countryside Act. Implementation would follow best practice guidance.
- IDMIT_15 - Aeration of watercourse where significant mortality or change in species abundances are likely to be attributed to water quality deterioration
- IDMIT_16 - Modification of flow structure across barriers to retain favourable conditions to facilitate the movement/migration of species (fish)
- IDMIT_19 - Capture and relocate individuals across significant barriers, taking into account migratory periods (immigration and emigration) (fish) and ensuring biosecurity measures are in place at all times.
- IDMIT_20 - Rescue of individuals or groups, in consultation with the EA or NE as appropriate, and relocation to suitable habitat where they are seen to be in distress or where artificially high densities are likely to result in significant impacts (fish, white-clawed crayfish). Measures will be taken to ensure biosecurity at all times. It should be noted that movement of crayfish requires licensing which can take up to 8 weeks. Movement of crayfish would only take place after consultation agreeing that this was the best course of action.
- IDMIT_23 - For CSOs identified as significant water quality prioritise planned maintenance work on and reactive pollution prevention work, including visits by operators.

Post-Drought (Drought option removed) – Monitoring

Supplementary monitoring which may be required after drought option implementation:

- PDMON_2 - Fine-lined pea mussel sampling to monitor recovery of their distribution and abundance.

Post-Drought (Drought option removed) – Mitigation

Mitigation which may be required after the drought option is removed:

- PDMIT_1 - Enhancement of habitat beyond the impacted reach (macroinvertebrates, fish, fine-lined pea mussel, white-clawed crayfish, water vole)
- PDMIT_3 - Modification to barriers and/or flows to improve passage where walkover survey identifies insufficient water depth or volume at obstacles (fish)
- PDMIT_4 - Capture and relocate across barrier (taking migratory period into account) where significant numbers of migratory fish congregate at obstacles (fish)
- PDMIT_6 - Restocking using juvenile lamprey ammocoetes within the catchment where monitoring indicates loss of fish abundance or recruitment (fish)
- PDMIT_5 - Relocation of juveniles where walkover surveys identify the likely desiccation of marginal habitats or loss of water depth at important habitats (fish, fine-lined pea mussel)
- PDMIT_7 - Restocking using offspring from broodstock from the catchment where monitoring indicates loss of fish abundance or recruitment (fish)

- PDMIT_8 - Restocking of coarse fish from the catchment where monitoring indicates loss of fish abundance or recruitment (fish)



Reach Overview Sheet

Ouse 1

WFD Waterbody:

Ouse from River Nidd to Stillingfleet Beck GB104027069593

Relevant Drought Option(s):

River Ouse at Moor Monkton

Sensitive Features and Impact Assessment:

- Naburn Marsh SSSI (Negligible)
- Clifton Ings and Rawcliffe Meadows SSSI (Negligible)
- Church Ings SSSI / LWS (Negligible)
- Acaster South Ings SSSI (Negligible)
- Fulford Ings SSSI (Negligible)
- River Ouse LWS (Minor)
- Bishopthorpe Ings LWS (Negligible)
- Gollie Ponds LWS (Minor)
- Middlethorpe Crematorium LWS (Negligible)
- Naburn Hall Meadow / Ings LWS (Negligible)
- Clifton Ings LWS (Negligible)
- Rawcliffe Ings Dyke LWS (Negligible)
- *Chrysolina graminis* (Negligible)
- Water vole (Moderate)
- Otter (Negligible)
- Atlantic salmon (Negligible)
- Brown / sea trout (Negligible)
- River Lamprey (Minor)
- European eel (Negligible)
- Sea lamprey (Moderate)
- Barbel (Negligible)
- Brook lamprey (Moderate)
- Bullhead (Negligible)
- Grayling (Negligible)
- Fish (Minor)
- Invertebrates (Minor)

Significant Water Quality Pressures:

- Riverside Gardens CSO SE5569654982
 - Jubilee Terrace CSO SE58995254
 - Grosvenor Terrace CSO SE5997252840
 - Skeldergate Bridge CSO SE6032851287
 - Terry Avenue CSO SE6048351022
 - Fishergate CSO SE60745451000
 - Lendal Hill CSO SE6001551986
 - Marygate Lane CSO SE5973352285
 - Queens Staith CSO SE6019251592
 - Marygate Landing No.2 CSO SE5974352059
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- The Esplanade York CSO SE59195240
 - **Woolworths CSO SE6022051700**
 - **Butcher Terrace CSO SE6035050290**
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Mitigation Triggers – Relevant Water Quality Thresholds:

Water quality thresholds appropriate to WFD river type:

- Moderate-Poor status thresholds for lowland and high alkalinity rivers (less than 54% dissolved oxygen saturation; in excess of 1.1mg/l total ammonia)
 - Additional unionised ammonia threshold of 40µg/l further to WFD requirements
-

Baseline Monitoring

Baseline monitoring proposed to ensure an adequate baseline dataset exists to describe non-drought conditions for those receptors likely to be impacted by drought order implementation and to fill any data gaps and reduce uncertainty identified during the environmental assessment.

Routine Baseline Monitoring:

- BMON_1 - EA/YWSL to continue monitor river flows and levels/reservoir levels and spill at key monitoring sites
- BMON_2 - EA to continue routine water quality monitoring at existing network of sites on current monthly programme, which includes those on un-impacted reaches suitable as control sites.
- BMON_3 - Macroinvertebrate monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare.
- BMON_4 - Fish monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare.

Targeted Baseline Monitoring:

- BMON_7 - Targeted juvenile lamprey surveys to identify distribution of habitat and an indicative population status within reaches subject to serious hydrological stress.

On-set of Environmental Drought- Monitoring

Subject to the availability of relevant data, the following walkover survey should be carried out prior to drought order implementation

- ODMON_1 – Walkover surveys of habitat quality and identification of drought sensitive habitats such as areas of riffle, pools and artificial features such as weirs and sluices that may be isolated or impassable during low flows. Results to be captured by annotated walkover maps and completion of a 'River Conditions Observation Form - Low Flows' form.
 - Site 1: 500m located within SE56535532 to SE57035525

In-Drought (During drought option implementation) – Monitoring

In order to establish impacts and target mitigation the following surveillance walkover surveys should be completed during the drought option implementation (including on the day of the flow change, the day after and then weekly thereafter until no further changes are noted):

- IDMON_1 - Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems (reaches to match those in ODMON_1):
 - Site 1: 500m located within SE56535532 to SE57035525
- IDMON_2 - Targeted surveillance walkover surveys of water quality and ecological stress local to 'significant' water quality pressures', to include water quality spot sampling in priority areas such as pools and weirs where aquatic species may become isolated during low flows:

- None
- IDMON_3 - Storm intensity forecasting to predict likely CSO spill events and the need for pre-emptive mitigation:
 - Riverside Gardens CSO SE5569654982
 - Jubilee Terrace CSO SE58995254
 - Grosvenor Terrace CSO SE5997252840
 - Skeldergate Bridge CSO SE6032851287
 - Terry Avenue CSO SE6048351022
 - Fishergate CSO SE60745451000
 - Lendal Hill CSO SE6001551986
 - Marygate Lane CSO SE5973352285
 - Queens Staith CSO SE6019251592
 - Marygate Landing No.2 CSO SE5974352059
 - The Esplanade York CSO SE59195240
 - Woolworths CSO SE6022051700
 - Butcher Terrace CSO SE6035050290

In-Drought (During drought option implementation) – Mitigation

Mitigation which may be required during the drought option implementation.

- IDMIT_1 - Negotiation with the licence holder of a temporary reduction of third party abstractions presenting 'significant' impacts to sensitive features, including financial compensation by Yorkshire Water.
- IDMIT_6 - Gradual phase-in of reduction in water volume/flow to avoid stranding of individuals (fish, white-clawed crayfish, fine-lined pea mussel)
- IDMIT_8 - Temporary reduction in volume of abstraction or increase in compensation release (fish)
- IDMIT_10 - Creation of alternative refuges in deeper water where walkover surveys identify the loss of important deep water habitat or high densities of fauna in refuges (fish, white-clawed crayfish, water vole)
- IDMIT_11 - Provision of in-stream structures and flow baffles to create functional refuges to support flow sensitive species where walkover surveys identify a projected loss of habitat inundation (macroinvertebrates, fish, white-clawed crayfish, water vole, otter)
- IDMIT_13 - Provision of piscivorous "visual" bird scaring measures (e.g. using streamers in riparian trees) to control predation upon species using refuges (fish). These visual measures would only be implemented following consultation with the EA, Natural England and bird specialists, particularly taking account of protected species under the 1981 Wildlife and Countryside Act. Implementation would follow best practice guidance.
- IDMIT_15 - Aeration of watercourse where significant mortality or change in species abundances are likely to be attributed to water quality deterioration
- IDMIT_16 - Modification of flow structure across barriers to retain favourable conditions to facilitate the movement/migration of species (fish)
- IDMIT_19 - Capture and relocate individuals across significant barriers, taking into account migratory periods (immigration and emigration) (fish) and ensuring biosecurity measures are in place at all times.
- IDMIT_20 - Rescue of individuals or groups, in consultation with the EA or NE as appropriate, and relocation to suitable habitat where they are seen to be in distress or where artificially high

densities are likely to result in significant impacts (fish, white-clawed crayfish). Measures will be taken to ensure biosecurity at all times. It should be noted that movement of crayfish requires licensing which can take up to 8 weeks. Movement of crayfish would only take place after consultation agreeing that this was the best course of action.

- IDMIT_23 - For CSOs identified as significant water quality prioritise planned maintenance work on and reactive pollution prevention work, including visits by operators.

Post-Drought (Drought option removed) – Monitoring

Supplementary monitoring which may be required after drought option implementation:

- None

Post-Drought (Drought option removed) – Mitigation

Mitigation which may be required after the drought option is removed:

- PDMIT_1 - Enhancement of habitat beyond the impacted reach (macroinvertebrates, fish, fine-lined pea mussel, white-clawed crayfish, water vole)
- PDMIT_3 - Modification to barriers and/or flows to improve passage where walkover survey identifies insufficient water depth or volume at obstacles (fish)
- PDMIT_4 - Capture and relocate across barrier (taking migratory period into account) where significant numbers of migratory fish congregate at obstacles (fish)
- PDMIT_5 - Relocation of juveniles where walkover surveys identify the likely desiccation of marginal habitats or loss of water depth at important habitats (fish, fine-lined pea mussel)
- PDMIT_6 - Restocking using juvenile lamprey ammocoetes within the catchment where monitoring indicates loss of fish abundance or recruitment (fish)
- PDMIT_7 - Restocking using offspring from broodstock from the catchment where monitoring indicates loss of fish abundance or recruitment (fish)
- PDMIT_8 - Restocking of coarse fish from the catchment where monitoring indicates loss of fish abundance or recruitment (fish)



Reach Overview Sheet

Wharfe 1

WFD Waterbody:

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

Relevant Drought Option(s):

River Wharfe at Lobwood

Sensitive Features and Impact Assessment:

- River Wharfe, Otley & Mid Wharfedale/Wetherby LWS (Minor)
- Low Mill, Addingham LWS (Negligible)
- Ben Rhydding Gravel Pits LWS (Negligible)
- Otley Sand and Gravel Pits LWS (Negligible)
- Otter (Negligible)
- Water vole (Moderate)
- Fine-lined pea mussel (Negligible)
- Atlantic salmon (Moderate)
- Brown trout (Moderate)
- European Eel (Minor)
- River lamprey (Moderate)
- Brook lamprey (Moderate)
- Barbel (Minor)
- Bullhead (Minor)
- Grayling (Minor)
- Fish (Minor)
- Invertebrates (Moderate)

Significant Water Quality Pressures:

- Ilkley WwTW SE1254048390
- Ebor Way CSO SE4407045290
- Tadcaster West CSO SE4884843374
- Tadcaster East (Britannia Inn) CSO SE4877043450
- Billams Hill CSO SE2009945880
- Rivadale View CSO SE1192448068

Mitigation Triggers – Relevant Water Quality Thresholds:

Water quality thresholds appropriate to WFD river type:

- Moderate-Poor status thresholds for lowland and high alkalinity 'salmonid water' 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

Baseline Monitoring

Baseline monitoring proposed to ensure an adequate baseline dataset exists to describe non-drought conditions for those receptors likely to be impacted by drought permit implementation and to fill any data gaps and reduce uncertainty identified during the environmental assessment.

Routine Baseline Monitoring:

- BMON_1 - EA/YWSL to continue monitor river flows and levels/reservoir levels and spill at key monitoring sites
- BMON_2 - EA to continue routine water quality monitoring at existing network of sites on current monthly programme, which includes those on un-impacted reaches suitable as control sites.
- BMON_3 - Macroinvertebrate monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare.
- BMON_4 - Fish monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare.

Targeted Baseline Monitoring:

- BMON_7 - Targeted juvenile lamprey surveys to identify distribution of habitat and an indicative population status within reaches subject to serious hydrological stress.

On-set of Environmental Drought- Monitoring

Subject to the availability of relevant data, the following walkover survey should be carried out prior to drought permit implementation

- ODMON_1 – Walkover surveys of habitat quality and identification of drought sensitive habitats such as areas of riffle, pools and artificial features such as weirs and sluices that may be isolated or impassable during low flows. Results to be captured by annotated walkover maps and completion of a 'River Conditions Observation Form - Low Flows' form.
 - Site 1: 500m located within SE0755051963to SE08045182

In-Drought (During drought option implementation) – Monitoring

In order to establish impacts and target mitigation the following surveillance walkover surveys should be completed during the drought option implementation (including on the day of the flow change, the day after and then weekly thereafter until no further changes are noted):

- IDMON_1 - Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems (reaches to match those in ODMON_1):
 - Site 1: 500m located within SE0755051963to SE08045182
- IDMON_2 - Targeted surveillance walkover surveys of water quality and ecological stress local to 'significant' water quality pressures', to include water quality spot sampling in priority areas such as pools and weirs where aquatic species may become isolated during low flows:
 - Site 2: 10m upstream and at least 100m downstream of the Ilkley WwTW discharge outfall at SE1254048390

- IDMON_3 - Storm intensity forecasting to predict likely CSO spill events and the need for pre-emptive mitigation:
 - Ebor Way CSO SE4407045290
 - Tadcaster West CSO SE4884843374
 - Tadcaster East (Britannia Inn) CSO SE4877043450
 - Billams Hill CSO SE2009945880
 - Rivadale View CSO SE1192448068

In-Drought (During drought option implementation) – Mitigation

Mitigation which may be required during the drought option implementation.

- IDMIT_3 - Improving the effluent quality from Yorkshire Water WwTWs presenting 'significant' impacts to sensitive features, thereby reducing the water quality pressure (ammonia and oxygen balance) on the impacted features.
- IDMIT_4 - Artificial freshet release to dilute/displace water quality reduction
- IDMIT_6 - Gradual phase-in of reduction in water volume/flow to avoid stranding of individuals (fish, white-clawed crayfish, fine-lined pea mussel)
- IDMIT_8 - Temporary reduction in volume of abstraction or increase in compensation release (fish)
- IDMIT_10 - Creation of alternative refuges in deeper water where walkover surveys identify the loss of important deep water habitat or high densities of fauna in refuges (fish, white-clawed crayfish, water vole)
- IDMIT_11 - Provision of in-stream structures and flow baffles to create functional refuges to support flow sensitive species where walkover surveys identify a projected loss of habitat inundation (macroinvertebrates, fish, white-clawed crayfish, water vole, otter)
- IDMIT_13 - Provision of piscivorous "visual" bird scaring measures (e.g. using streamers in riparian trees) to control predation upon species using refuges (fish). These visual measures would only be implemented following consultation with the EA, Natural England and bird specialists, particularly taking account of protected species under the 1981 Wildlife and Countryside Act. Implementation would follow best practice guidance.
- IDMIT_15 - Aeration of watercourse where significant mortality or change in species abundances are likely to be attributed to water quality deterioration
- IDMIT_16 - Modification of flow structure across barriers to retain favourable conditions to facilitate the movement/migration of species (fish)
- IDMIT_19 - Capture and relocate individuals across significant barriers, taking into account migratory periods (immigration and emigration) (fish) and ensuring biosecurity measures are in place at all times.
- IDMIT_20 - Rescue of individuals or groups, in consultation with the EA or NE as appropriate, and relocation to suitable habitat where they are seen to be in distress or where artificially high densities are likely to result in significant impacts (fish, white-clawed crayfish). Measures will be taken to ensure biosecurity at all times. It should be noted that movement of crayfish requires licensing which can take up to 8 weeks. Movement of crayfish would only take place after consultation agreeing that this was the best course of action.
- IDMIT_23 - For CSOs identified as significant water quality prioritise planned maintenance work on and reactive pollution prevention work, including visits by operators.

Post-Drought (Drought option removed) – Monitoring

Supplementary monitoring which may be required after drought option implementation:

- None

Post-Drought (Drought option removed) – Mitigation

Mitigation which may be required after the drought option is removed:

- PDMIT_1 - Enhancement of habitat beyond the impacted reach (macroinvertebrates, fish, fine-lined pea mussel, white-clawed crayfish, water vole)
- PDMIT_3 - Modification to barriers and/or flows to improve passage where walkover survey identifies insufficient water depth or volume at obstacles (fish)
- PDMIT_4 - Capture and relocate across barrier (taking migratory period into account) where significant numbers of migratory fish congregate at obstacles (fish)
- PDMIT_5 - Relocation of juveniles where walkover surveys identify the likely desiccation of marginal habitats or loss of water depth at important habitats (fish, fine-lined pea mussel)
- PDMIT_6 - Restocking using juvenile lamprey ammocoetes within the catchment where monitoring indicates loss of fish abundance or recruitment (fish)
- PDMIT_7 - Restocking using offspring from broodstock from the catchment where monitoring indicates loss of fish abundance or recruitment (fish)
- PDMIT_8 - Restocking of coarse fish from the catchment where monitoring indicates loss of fish abundance or recruitment (fish)



Reach Overview Sheet

Hull 2

WFD Waterbody:

GB104026067000 Hull from West Beck to Arram Beck; GB104026067212 Hull from Arram Beck to Humber; GB530402609202 Humber Middle

Relevant Drought Option(s):

River Hull at Hempholme

Sensitive Features and Impact Assessment:

- Otter (Negligible)
- Water vole (Negligible)
- Barbel (Moderate)
- Brook lamprey (Moderate)
- Brown trout (Moderate)
- Bullhead (Moderate)
- European eel (Moderate)
- Grayling (Moderate)
- River lamprey (Moderate)
- Fish (Moderate)
- Invertebrates (Minor)
- Angling (Minor)

Significant Water Quality Pressures:

- Beverley WwTW TA0525039280

Mitigation Triggers – Relevant Water Quality Thresholds:

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

Baseline Monitoring

Baseline monitoring proposed to ensure an adequate baseline dataset exists to describe non-drought conditions for those receptors likely to be impacted by drought permit implementation and to fill any data gaps and reduce uncertainty identified during the environmental assessment.

Routine Baseline Monitoring:

- BMON_1 - EA/YWSL to continue monitor river flows and levels/reservoir levels and spill at key monitoring sites
- BMON_2 - EA to continue routine water quality monitoring at existing network of sites on current monthly programme, which includes those on un-impacted reaches suitable as control sites.

- BMON_3 - Macroinvertebrate monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare.
- BMON_4 - Fish monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare.

Targeted Baseline Monitoring:

- None

On-set of Environmental Drought- Monitoring

Subject to the availability of relevant data, the following walkover survey should be carried out prior to drought permit implementation

- ODMON_1 – Walkover surveys of habitat quality and identification of drought sensitive habitats such as areas of riffle, pools and artificial features such as weirs and sluices that may be isolated or impassable during low flows. Results to be captured by annotated walkover maps and completion of a 'River Conditions Observation Form - Low Flows' form.

- Site 1: 500m located within TA06333933 to TA06553892

In-Drought (During drought option implementation) – Monitoring

In order to establish impacts and target mitigation the following surveillance walkover surveys should be completed during the drought option implementation (including on the day of the flow change, the day after and then weekly thereafter until no further changes are noted):

- IDMON_1 - Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems (reaches to match those in ODMON_1):
 - Site 1: 500m located within TA06333933 to TA06553892
- IDMON_2 - Targeted surveillance walkover surveys of water quality and ecological stress local to 'significant' water quality pressures', to include water quality spot sampling and deployment of continuous monitoring sondes if appropriate:
 - Site 2: upstream and downstream the Beverley WwTW discharge to the River Hull at TA0573139383 to the point at which any noticable decrease in dissolved oxygen is no longer apparent.
- IDMON_3 - Storm intensity forecasting to predict likely CSO spill events and the need for pre-emptive mitigation:
 - None

In-Drought (During drought option implementation) – Mitigation

Mitigation which may be required during the drought option implementation.

- IDMIT_3 - Improving the effluent quality from Yorkshire Water WwTWs presenting 'significant' impacts to sensitive features, thereby reducing the water quality pressure (ammonia and oxygen balance) on the impacted features.
- IDMIT_4 - Artificial freshet release to dilute/displace water quality reduction
- IDMIT_8 - Temporary reduction in volume of abstraction or increase in compensation release (fish)
- IDMIT_13 - Provision of piscivorous "visual" bird scaring measures (e.g. using streamers in riparian trees) to control predation upon species using refuges (fish). These visual measures would only be implemented following consultation with the EA, Natural England and bird

specialists, particularly taking account of protected species under the Wildlife and Countryside Act. Implementation would follow best practice guidance.

- IDMIT_15 - Aeration of watercourse where significant mortality or change in species abundances are likely to be attributed to water quality deterioration
- IDMIT_16 - Modification of flow structure across barriers to retain favourable conditions to facilitate the movement/migration of species (fish)
- IDMIT_19 - Capture and relocate individuals across significant barriers, taking into account migratory periods (immigration and emigration) (fish) and ensuring biosecurity measures are in place at all times.
- IDMIT_20 - Rescue of individuals or groups, in consultation with the EA or NE as appropriate, and relocation to suitable habitat where they are seen to be in distress or where artificially high densities are likely to result in significant impacts (fish). Measures will be taken to ensure biosecurity at all times. It should be noted that movement of crayfish requires licensing which can take up to 8 weeks. Movement of crayfish would only take place after consultation agreeing that this was the best course of action.

Post-Drought (Drought option removed) – Monitoring

Supplementary monitoring which may be required after drought option implementation:

- None

Post-Drought (Drought option removed) – Mitigation

Mitigation which may be required after the drought option is removed:

- PDMIT_3 - Modification to barriers and/or flows to improve passage where walkover survey identifies insufficient water depth or volume at obstacles (fish)
- PDMIT_4 - Capture and relocate across barrier (taking migratory period into account) where significant numbers of migratory fish congregate at obstacles (fish)
- PDMIT_8 - Restocking of coarse fish from the catchment where monitoring indicates loss of fish abundance or recruitment (fish)



Reach Overview Sheet

Ouse 1 Cumulative

WFD Waterbody:

Ouse from River Nidd to Stillingfleet Beck GB104027069593

Relevant Drought Option(s):

River Ouse at Moor Monkton

Sensitive Features and Impact Assessment:

- Naburn Marsh SSSI (Negligible)
- Clifton Ings and Rawcliffe Meadows SSSI (Negligible)
- Church Ings SSSI / LWS (Negligible)
- Acaster South Ings SSSI (Negligible)
- Fulford Ings SSSI (Negligible)
- River Ouse LWS (Minor)
- Bishopthorpe Ings LWS (Negligible)
- Gollie Ponds LWS (Minor)
- Middlethorpe Crematorium LWS (4-3) (Negligible)
- Naburn Hall Meadow / Ings LWS (Negligible)
- Clifton Ings LWS (Negligible)
- Rawcliffe Ings Dyke LWS (Negligible)
- *Chrysolina graminis* (Negligible)
- Water vole (Moderate)
- Otter (Negligible)
- Atlantic salmon (Negligible)
- Brown / sea trout (Negligible)
- River Lamprey (Minor)
- European eel (Negligible)
- Sea lamprey (Moderate)
- Barbel (Negligible)
- Brook lamprey (Moderate)
- Bullhead (Negligible)
- Grayling (Negligible)
- Fish (Minor)
- Invertebrates (Minor)

Significant Water Quality Pressures:

- Riverside Gardens CSO SE5569654982
 - Jubilee Terrace CSO SE58995254
 - Grosvenor Terrace CSO SE5997252840
 - Skeldergate Bridge CSO SE6032851287
 - Terry Avenue CSO SE6048351022
 - Fishergate CSO SE60745451000
 - Lendal Hill CSO SE6001551986
 - Marygate Lane CSO SE5973352285
 - Queens Staith CSO SE6019251592
 - Marygate Landing No.2 CSO SE5974352059
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- The Esplanade York CSO SE59195240
 - Woolworths CSO SE6022051700
 - Butcher Terrace CSO SE6035050290
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Mitigation Triggers – Relevant Water Quality Thresholds:

Water quality thresholds appropriate to WFD river type:

- Moderate-Poor status thresholds for upland and low alkalinity rivers (less than 54% dissolved oxygen saturation; in excess of 1.1mg/l total ammonia)
 - Additional unionised ammonia threshold of 40µg/l further to WFD requirements
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Baseline Monitoring

Baseline monitoring proposed to ensure an adequate baseline dataset exists to describe non-drought conditions for those receptors likely to be impacted by drought permit/order implementation and to fill any data gaps and reduce uncertainty identified during the environmental assessment.

Routine Baseline Monitoring:

- BMON_1 - EA/YWSL to continue monitor river flows and levels/reservoir levels and spill at key monitoring sites
- BMON_2 - EA to continue routine water quality monitoring at existing network of sites on current monthly programme, which includes those on un-impacted reaches suitable as control sites.
- BMON_3 - Macroinvertebrate monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare.
- BMON_4 - Fish monitoring at a number of locations, including rivers potentially affected by drought measures; to continue in low flow/drought years pending agreement with the EA regarding aquatic species welfare.

Targeted Baseline Monitoring:

- BMON_7 - Targeted juvenile lamprey surveys to identify distribution of habitat and an indicative population status within reaches subject to serious hydrological stress.

On-set of Environmental Drought- Monitoring

Subject to the availability of relevant data, the following walkover survey should be carried out prior to drought permit/order implementation

- ODMON_1 – Walkover surveys of habitat quality and identification of drought sensitive habitats such as areas of riffle, pools and artificial features such as weirs and sluices that may be isolated or impassable during low flows. Results to be captured by annotated walkover maps and completion of a 'River Conditions Observation Form - Low Flows' form.
 - Site 1: 500m located within SE56535532 to SE57035525

In-Drought (During drought option implementation) – Monitoring

In order to establish impacts and target mitigation the following surveillance walkover surveys should be completed during the drought option implementation (including on the day of the flow change, the day after and then weekly thereafter until no further changes are noted):

- IDMON_1 - Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems (reaches to match those in ODMON_1):
 - Site 1: 500m located within SE56535532 to SE57035525

- IDMON_2 - Targeted surveillance walkover surveys of water quality and ecological stress local to 'significant' water quality pressures', to include water quality spot sampling in priority areas such as pools and weirs where aquatic species may become isolated during low flows:
 - None
- IDMON_3 - Storm intensity forecasting to predict likely CSO spill events and the need for pre-emptive mitigation:
 - Riverside Gardens CSO SE5569654982
 - Jubilee Terrace CSO SE58995254
 - Grosvenor Terrace CSO SE5997252840
 - Skeldergate Bridge CSO SE6032851287
 - Terry Avenue CSO SE6048351022
 - Fishergate CSO SE60745451000
 - Lendal Hill CSO SE6001551986
 - Marygate Lane CSO SE5973352285
 - Queens Staith CSO SE6019251592
 - Marygate Landing No.2 CSO SE5974352059
 - The Esplanade York CSO SE59195240
 - Woolworths CSO SE6022051700
 - Butcher Terrace CSO SE6035050290

In-Drought (During drought option implementation) – Mitigation

Mitigation which may be required during the drought option implementation.

- IDMIT_1 - Negotiation with the licence holder of a temporary reduction of third party abstractions presenting 'significant' impacts to sensitive features, including financial compensation by Yorkshire Water.
- IDMIT_6 - Gradual phase-in of reduction in water volume/flow to avoid stranding of individuals (fish, white-clawed crayfish, fine-lined pea mussel)
- IDMIT_8 - Temporary reduction in volume of abstraction or increase in compensation release (fish)
- IDMIT_10 - Creation of alternative refuges in deeper water where walkover surveys identify the loss of important deep water habitat or high densities of fauna in refuges (fish, white-clawed crayfish, water vole)
- IDMIT_11 - Provision of in-stream structures and flow baffles to create functional refuges to support flow sensitive species where walkover surveys identify a projected loss of habitat inundation (macroinvertebrates, fish, white-clawed crayfish, water vole, otter)
- IDMIT_13 - Provision of piscivorous "visual" bird scaring measures (e.g. using streamers in riparian trees) to control predation upon species using refuges (fish). These visual measures would only be implemented following consultation with the EA, Natural England and bird specialists, particularly taking account of protected species under the 1981 Wildlife and Countryside Act. Implementation would follow best practice guidance.
- IDMIT_15 - Aeration of watercourse where significant mortality or change in species abundances are likely to be attributed to water quality deterioration
- IDMIT_16 - Modification of flow structure across barriers to retain favourable conditions to facilitate the movement/migration of species (fish)
- IDMIT_19 - Capture and relocate individuals across significant barriers, taking into account migratory periods (immigration and emigration) (fish) and ensuring biosecurity measures are in place at all times.

- IDMIT_20 - Rescue of individuals or groups, in consultation with the EA or NE as appropriate, and relocation to suitable habitat where they are seen to be in distress or where artificially high densities are likely to result in significant impacts (fish, white-clawed crayfish). Measures will be taken to ensure biosecurity at all times. It should be noted that movement of crayfish requires licensing which can take up to 8 weeks. Movement of crayfish would only take place after consultation agreeing that this was the best course of action.
- IDMIT_23 - For CSOs identified as significant water quality prioritise planned maintenance work on and reactive pollution prevention work, including visits by operators.

Post-Drought (Drought option removed) – Monitoring

Supplementary monitoring which may be required after drought option implementation:

- None

Post-Drought (Drought option removed) – Mitigation

Mitigation which may be required after the drought option is removed:

- PDMIT_1 - Enhancement of habitat beyond the impacted reach (macroinvertebrates, fish, fine-lined pea mussel, white-clawed crayfish, water vole)
- PDMIT_3 - Modification to barriers and/or flows to improve passage where walkover survey identifies insufficient water depth or volume at obstacles (fish)
- PDMIT_4 - Capture and relocate across barrier (taking migratory period into account) where significant numbers of migratory fish congregate at obstacles (fish)
- PDMIT_5 - Relocation of juveniles where walkover surveys identify the likely desiccation of marginal habitats or loss of water depth at important habitats (fish, fine-lined pea mussel)
- PDMIT_6 - Restocking using juvenile lamprey ammocoetes within the catchment where monitoring indicates loss of fish abundance or recruitment (fish)
- PDMIT_7 - Restocking using offspring from broodstock from the catchment where monitoring indicates loss of fish abundance or recruitment (fish)
- PDMIT_8 - Restocking of coarse fish from the catchment where monitoring indicates loss of fish abundance or recruitment (fish)