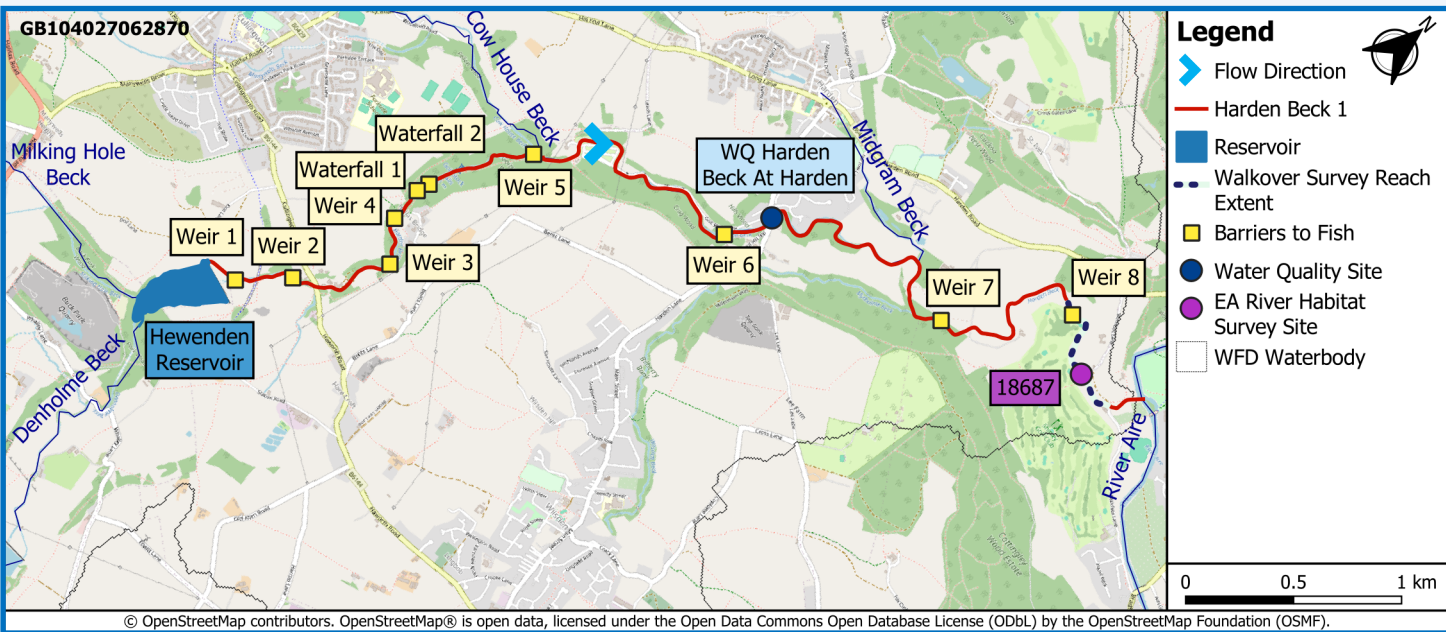


Reach Setting

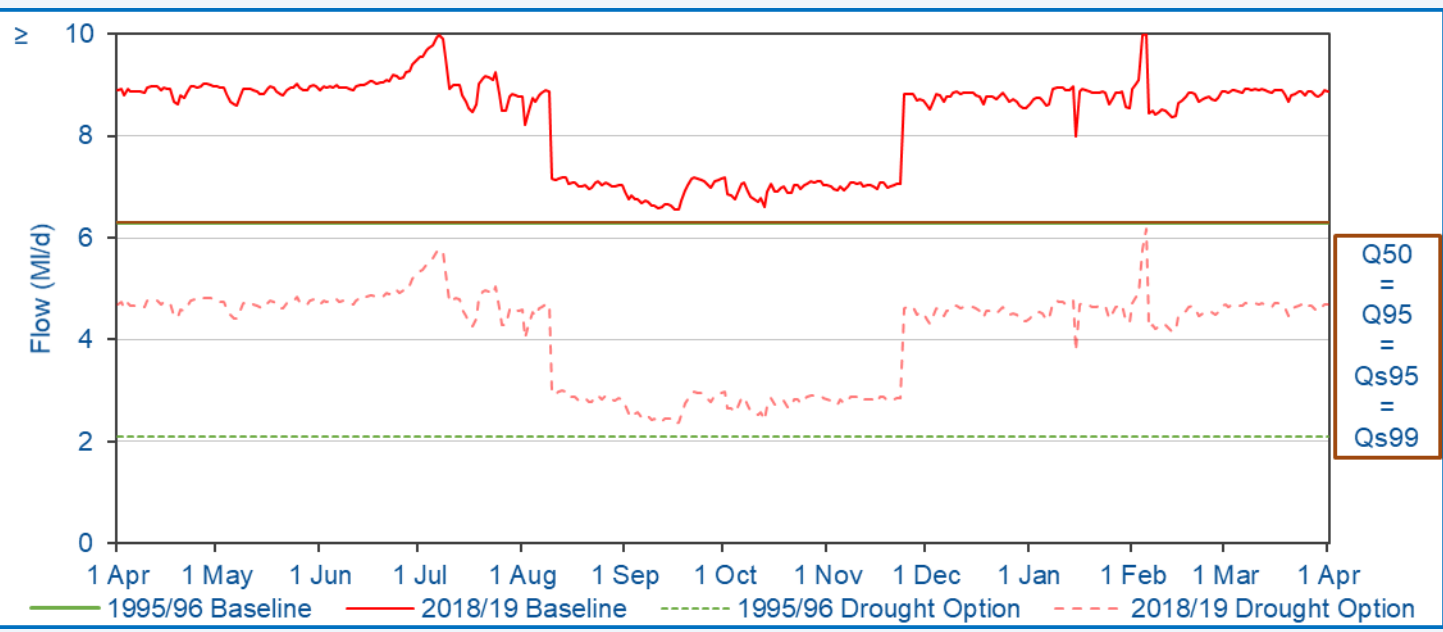


Reach Setting Information:

The superficial geology is composed of alluvium in the lower sections of the channel and surrounded by glacial till with some scattered hummocky glacial deposits. River terrace deposits are present prior to the confluence with the River Aire. Soil types are composed of freely draining, slightly acid loamy soils in the upper section of the reach and slowly permeable, seasonally wet acid loamy and clayey soils to the confluence with the River Aire. Urbanisation is limited.

	Supplementary Information
Catchment Area at Assessment Point	12.0km ²
Mean Slope Gradient	1.1°
Length of Reach	6.3km
Additional Catchment Area	21.9km ²
Upstream Reach	N/A
Downstream Reach	N/A

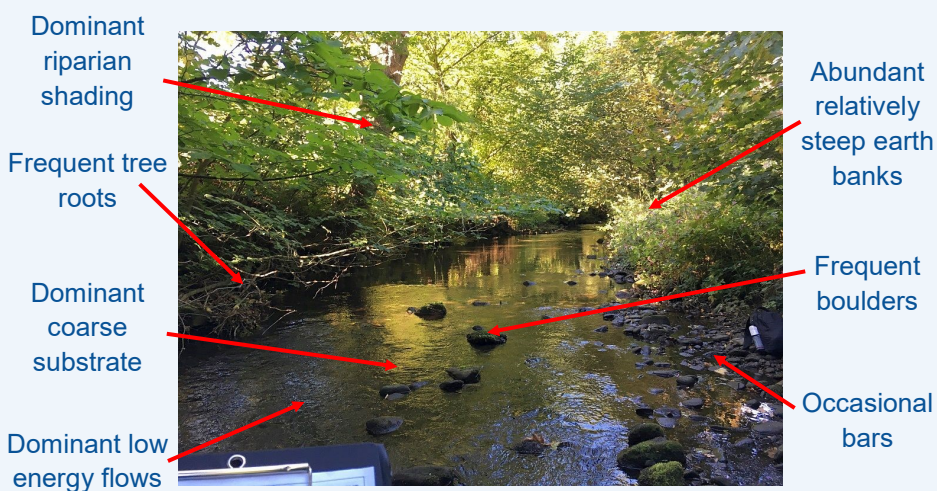
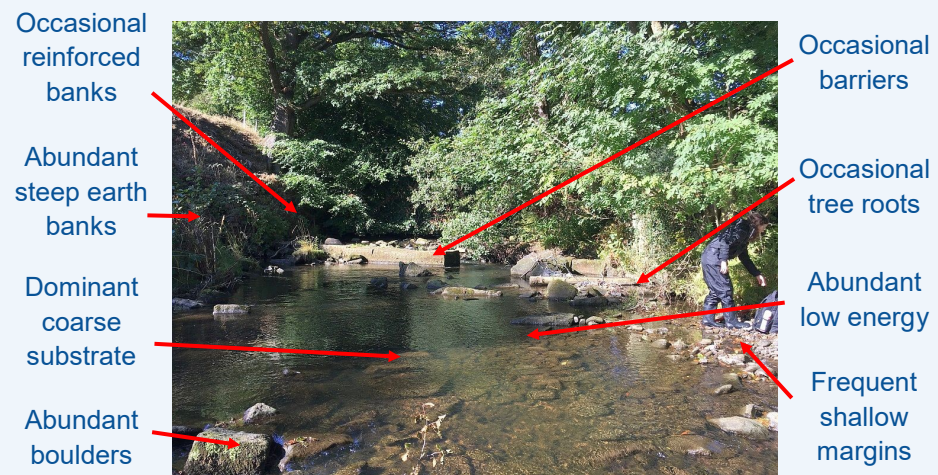
River Flow Regime



	Reference Conditions (Ml/d)	Drought Plan Conditions (Ml/d)	% Reduction	Impact
Q _s 95	6.30	2.08	67	Summer Major
Q _s 99	6.30	2.08	67	
Q95	6.30	2.08	67	Winter Major
Q50	6.30	2.08	67	

There are no significant flow additions/reductions associated with this reach

River Habitats



River Water Quality

There are no significant water quality pressures associated with this reach

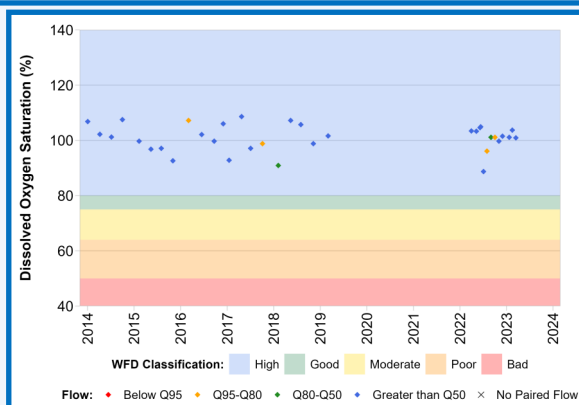
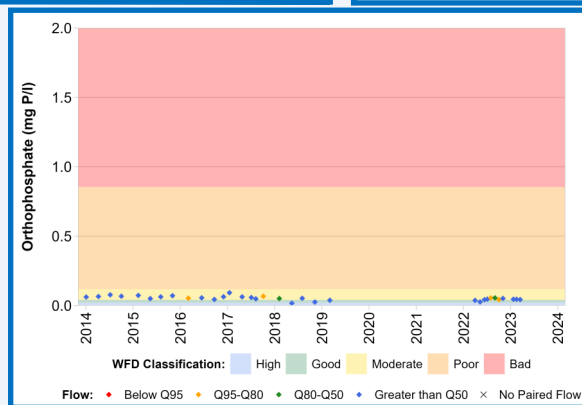
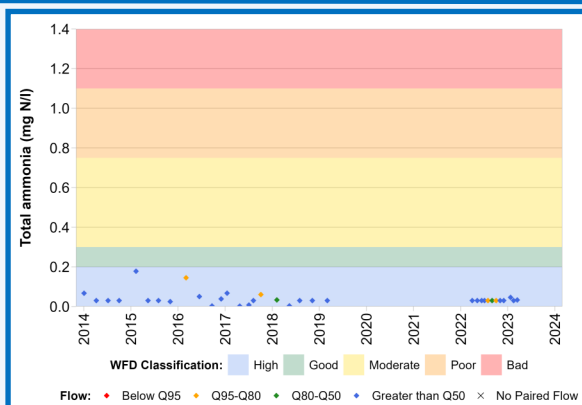
There are 3 water quality monitoring points in Harden Beck 1, as such the location with the highest data quality, Harden Beck at Harden (NE-49400457), has been used. The average pH between 2014-2023 was 8.0 with a maximum temperature of 16.9°C for the same period.



Figure A4.14

Harden Beck 1

Physical Environment Information



Reach Setting

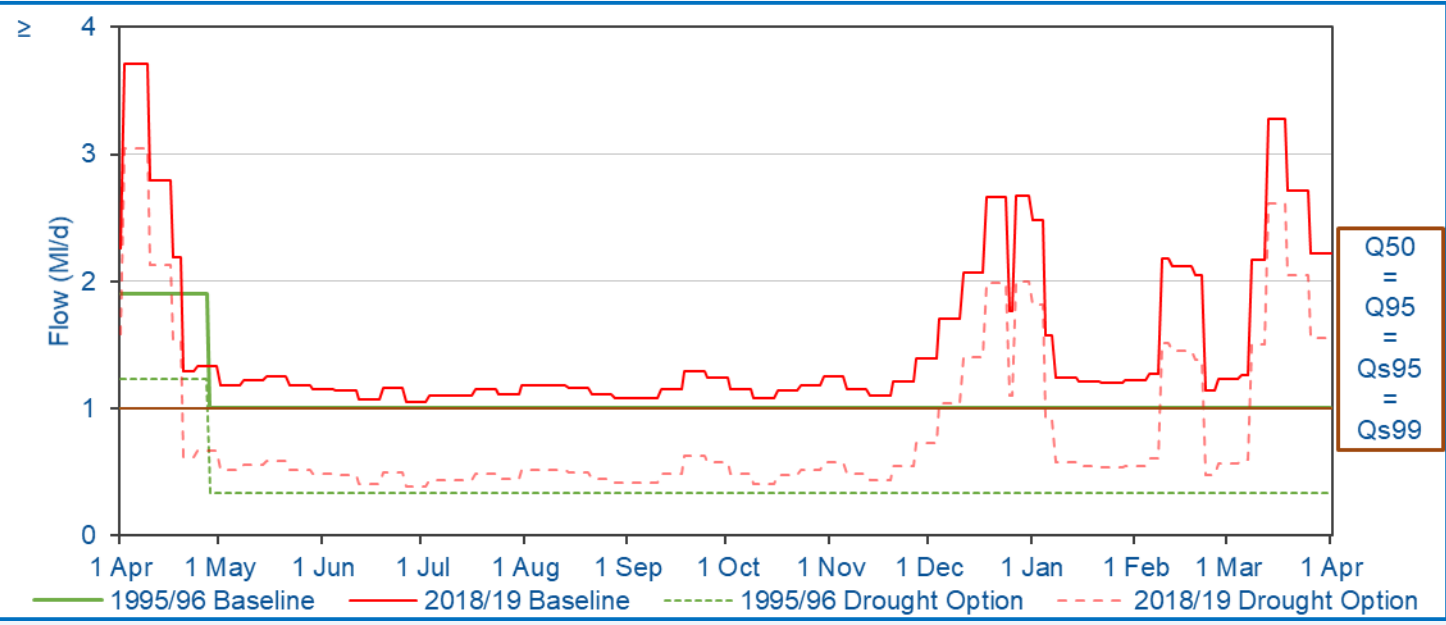


Reach Setting Information:

The superficial geology is composed of glacial till with some scattered hummocky glacial deposits around the confluence with the River Aire. Soil types in the reach are composed of slowly permeable, seasonally wet acid loamy and clayey soils. Urbanisation is very limited throughout the reach with the reach passing through Eldwick and a small urban development on the left bank prior to the confluence with the River Aire.

	Supplementary Information
Catchment Area at Assessment Point	3.5km ²
Mean Slope Gradient	2.1°
Length of Reach	3.4km
Additional Catchment Area	5.3km ²
Upstream Reach	N/A
Downstream Reach	River Aire 1

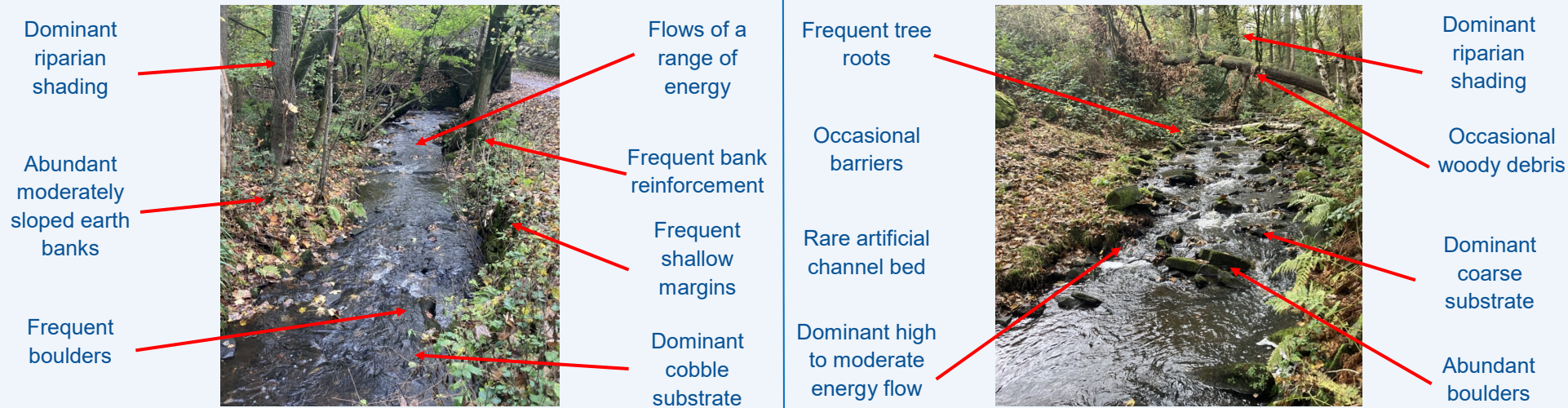
River Flow Regime



	Reference Conditions (ML/d)	Drought Plan Conditions (ML/d)	% Reduction	Impact
Q _s 95	1.00	0.33	67	Summer Major
Q _s 99	1.00	0.33	67	
Q95	1.00	0.33	67	Winter Major
Q50	1.00	0.33	67	

There are no significant flow additions/ reductions associated with this reach

River Habitats



River Water Quality

Significant Water Quality Pressures	Permit Conditions
Gilstead Lane 128/CSO	Intermittent discharge
Saltire Road /NO 2 CSO	Intermittent discharge

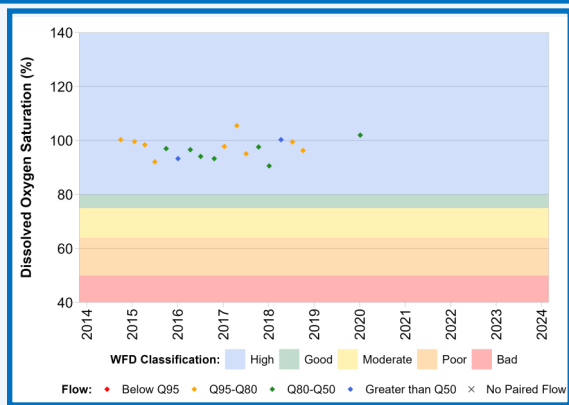
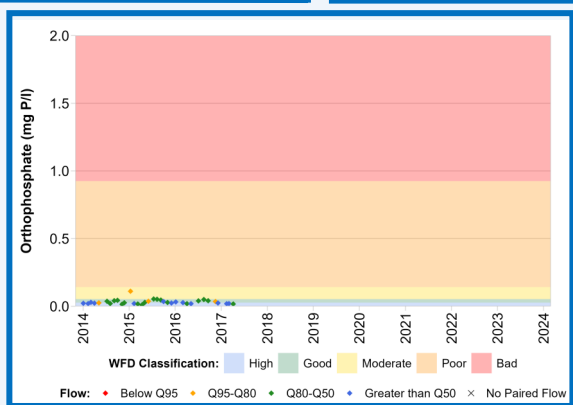
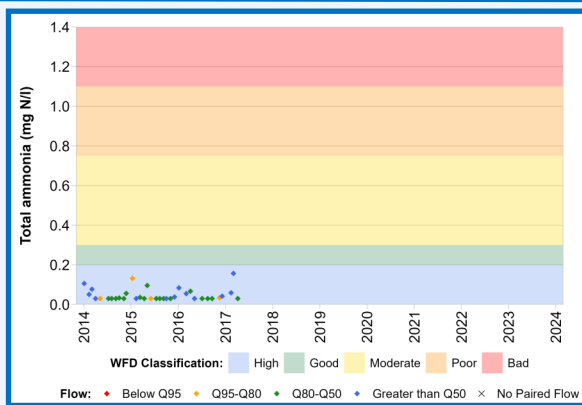
There is one water quality monitoring site, Loadpit Beck at Confluence with River Aire (NE49400555), has been used. The average pH between 2014-2023 was 7.9 with a maximum temperature of 16.6°C for the same period. This site does not include any samples for phosphate or ammonia. As such, a water quality site from the neighbouring Gill Beck (Baildon) At Otley Road Bridge (NE49405107), has been used as a representative example for these determinands, due to its similarities in catchment characteristics.



Figure A4.15

Loadpit Beck 1

Physical Environment Information



Reach Setting

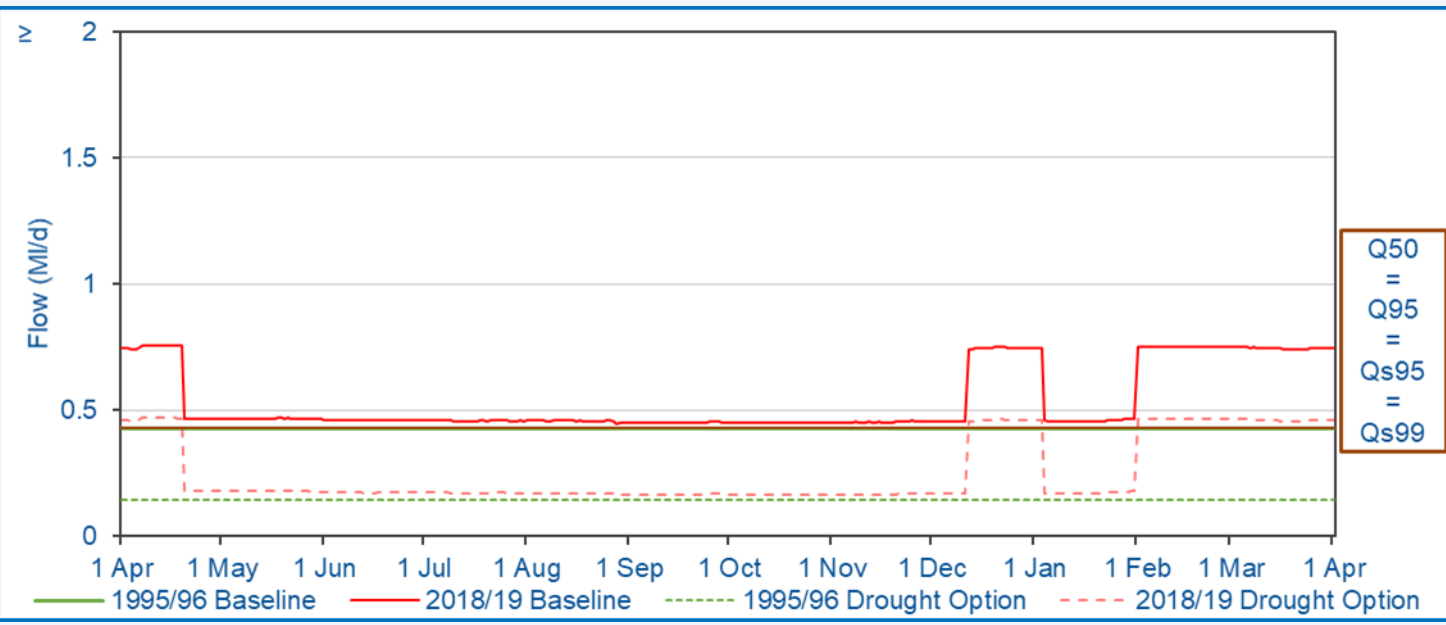


Reach Setting Information:

The superficial geology is composed of glacial till with some alluvium beneath the reach and scattered hummocky glacial deposits. Soil types in the reach are composed of slowly permeable, seasonally wet acid loamy and clayey soils adjacent to the reservoir outflow and freely draining, slightly acid loamy soils to the end of the reach. There is very limited urbanisation along the reach.

	Supplementary Information
Catchment Area at Assessment Point	1.3km ²
Mean Slope Gradient	3.1°
Length of Reach	2.4km
Additional Catchment Area	5.8km ²
Upstream Reach	N/A
Downstream Reach	Gill Beck 2

River Flow Regime



	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q _s 95	0.43	0.14	67	Summer Major
Q _s 99	0.43	0.14	67	
Q95	0.43	0.14	67	Winter Major
Q50	0.43	0.14	67	

There are no significant flow additions/reductions associated with this reach

River Habitats



River Water Quality

There are no significant water quality pressures associated with this reach

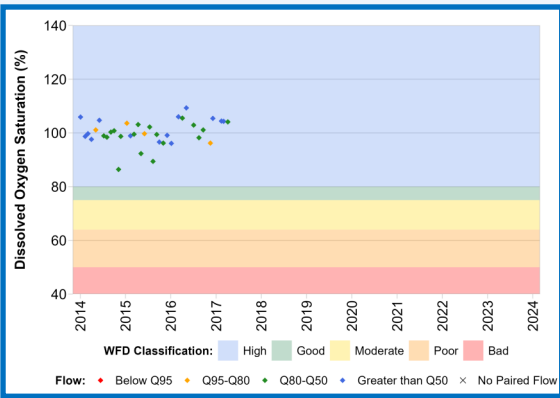
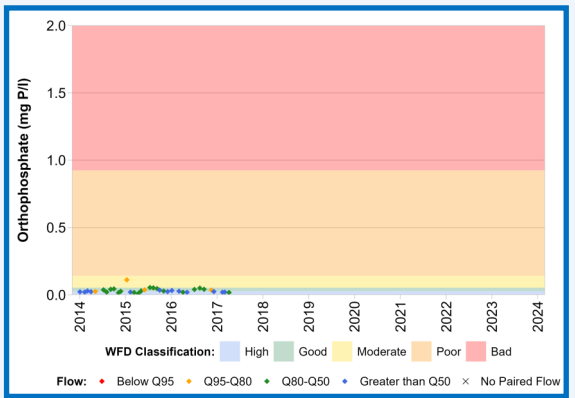
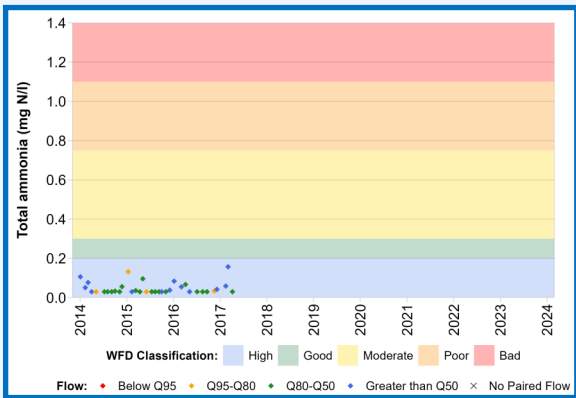
There is one sample point in this reach, Gill Beck at Potter Brow Bridge (NE49405107), however the data is highly limited, as such the first location in the downstream reach (Gill Beck 2), Gill Beck (Baildon) At Otley Road Bridge (NE49400999), has been used. The average pH between 2014-2023 was 7.9 with a maximum temperature of 15.1°C for the same period.



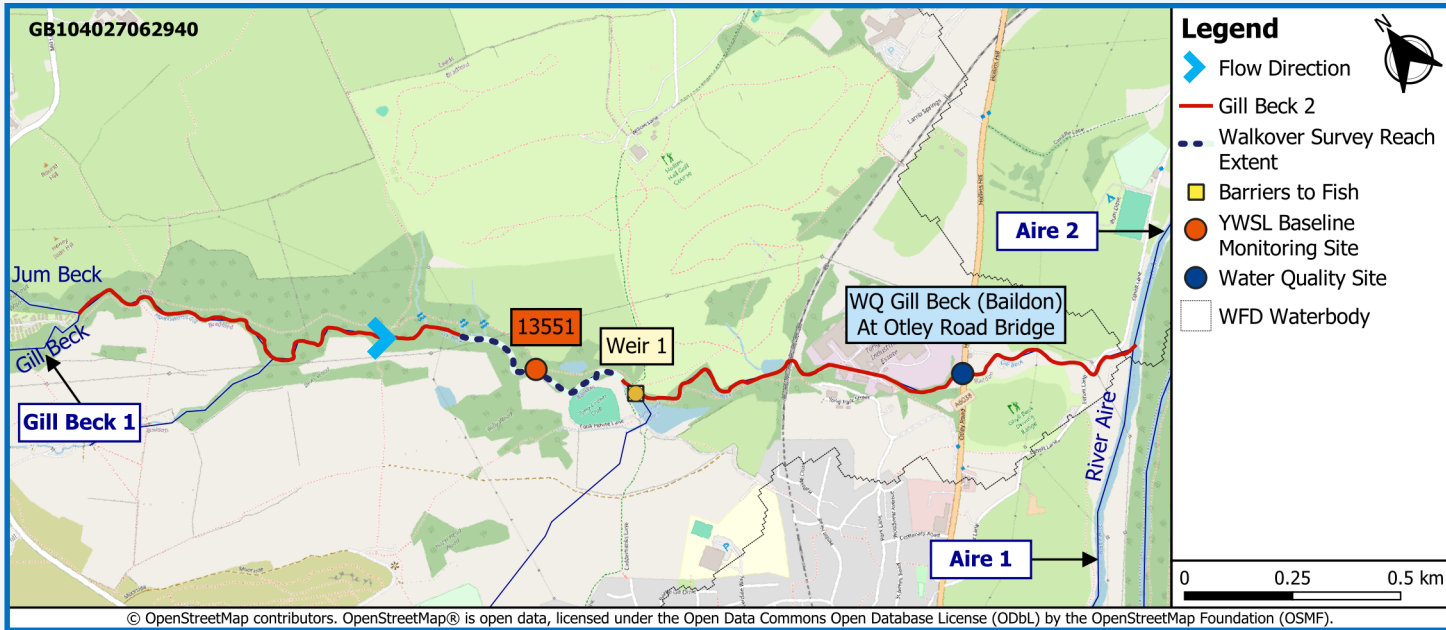
Figure A4.16

Gill Beck 1

Physical Environment Information



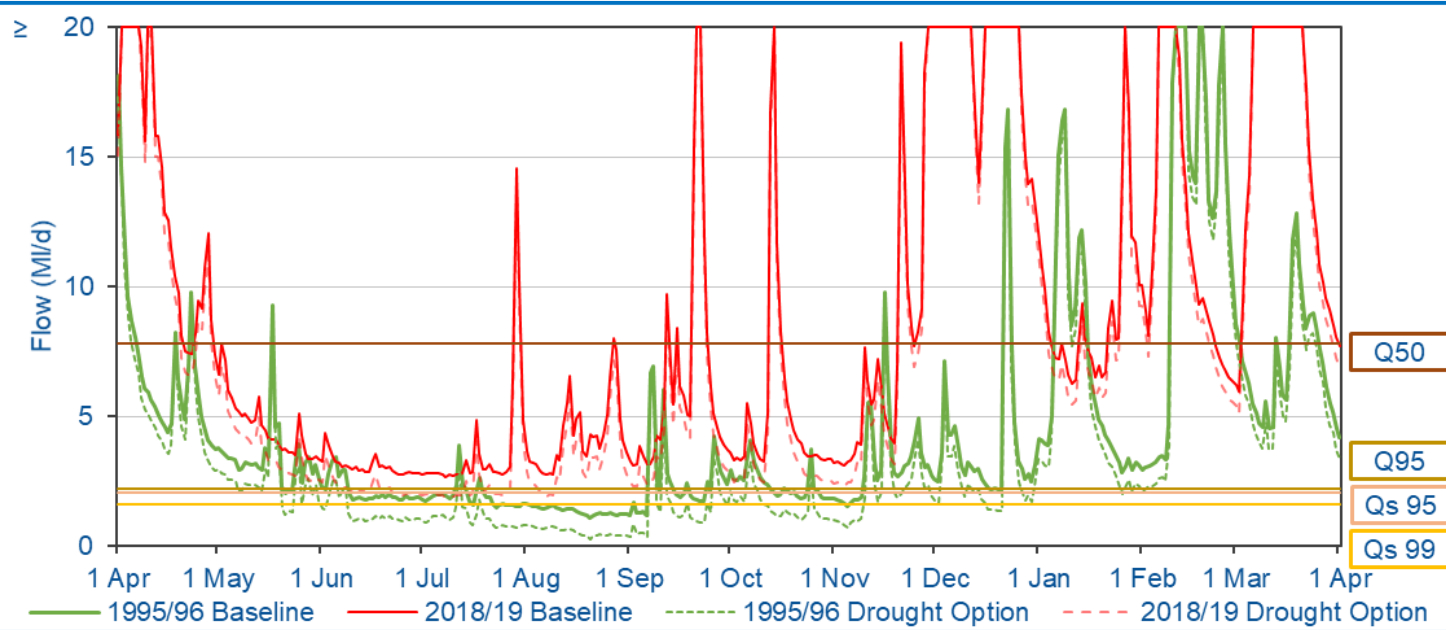
Reach Setting



Reach Setting Information:
The superficial geology is composed of glacial till with some alluvium beneath the reach and scattered hummocky glacial deposits. Soil types in the reach are composed of freely draining, slightly acid loamy soils with slowly permeable, seasonally wet acid loamy and clayey soils around the confluence with the River Aire. Suburban/urban land use is limited to a caravan park on the left bank, ~1.0km downstream and an industrial complex at ~3.2km downstream.

	Supplementary Information
Catchment Area at Assessment Point	8.3km ²
Mean Slope Gradient	1.5°
Length of Reach	4.0km
Additional Catchment Area	5.6km ²
Upstream Reach	Gill Beck 1
Downstream Reach	River Aire 2

River Flow Regime



	Reference Conditions (ML/d)	Drought Plan Conditions (ML/d)	% Reduction	Impact
Q _s 95	2.06	1.77	14	Summer Moderate
Q _s 99	1.64	1.35	17	
Q95	2.26	1.97	13	Winter Minor
Q50	8.08	7.79	3.5	

There are no significant flow additions/reductions associated with this reach

River Habitats



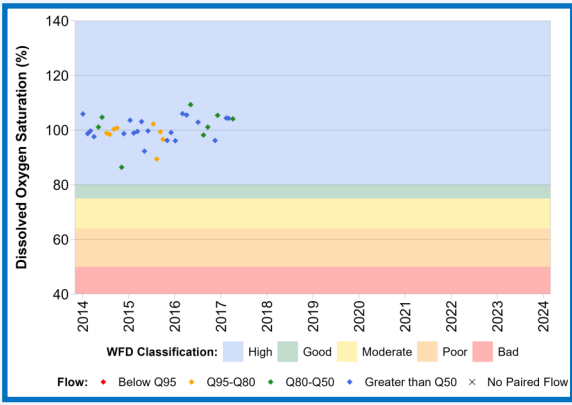
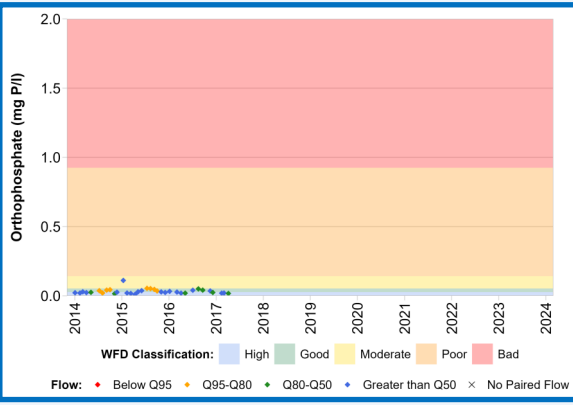
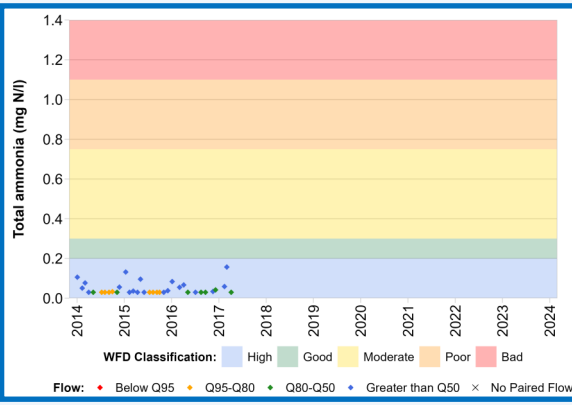
River Water Quality

There are no significant water quality pressures associated with this reach

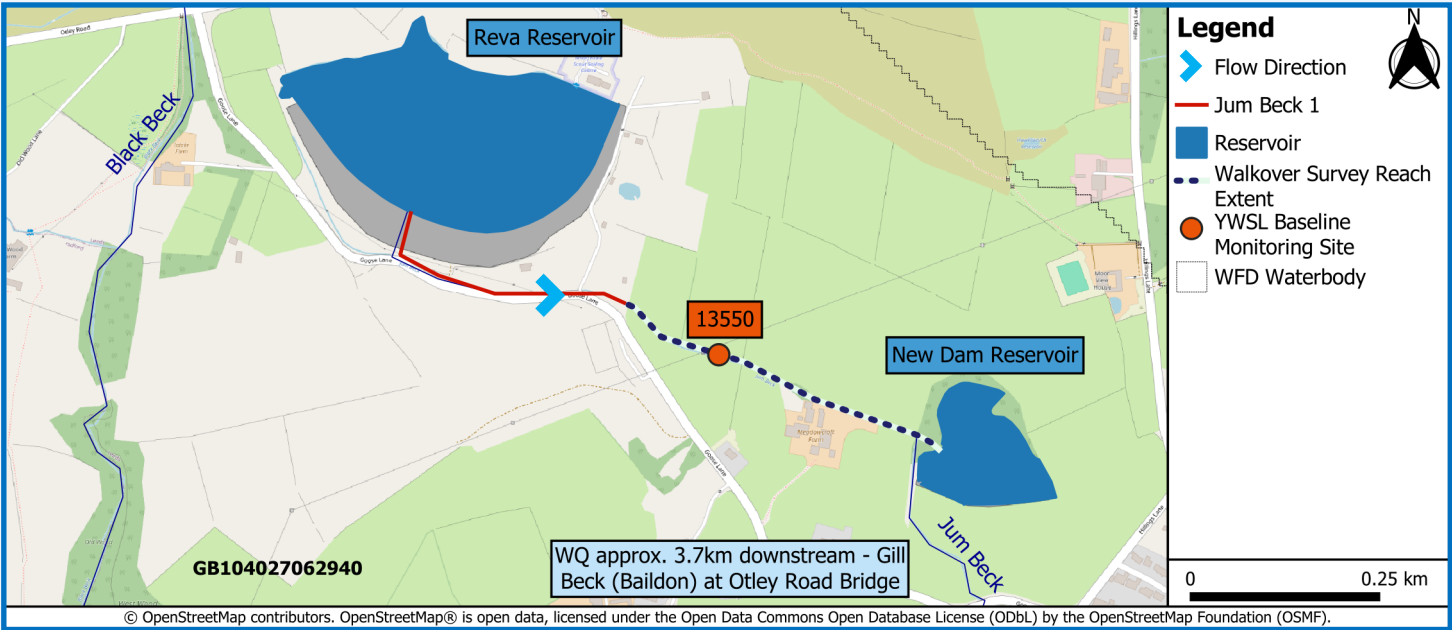
There is water quality monitoring site in Gill Beck 2: Gill Beck (Baildon) At Otley Road Bridge (NE49405107). The average pH between 2014-2023 was 7.9 with a maximum temperature of 15.1°C for the same period.



Figure A4.17
Gill Beck 2
Physical Environment Information



Reach Setting

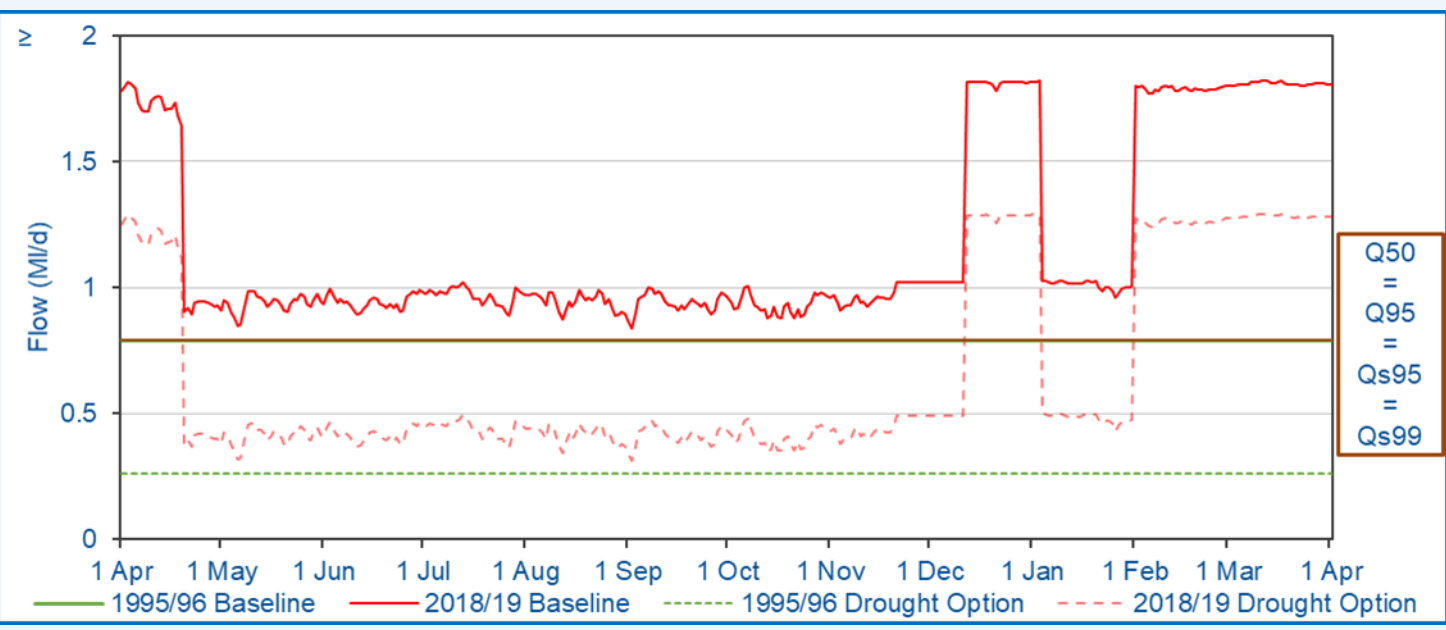


Reach Setting Information:

The superficial geology around the reservoir is composed of glacial till and some hummocky glacial deposits. Soils in the reservoir catchment are predominantly composed of slowly permeable, seasonally wet, acid loamy and clayey soils. Suburban/urban development is limited to a farm located ~0.9km downstream on the right bank.

	Supplementary Information
Catchment Area at Assessment Point	Unavailable on FEH
Mean Slope Gradient	1.0°
Length of Reach	1.0km
Additional Catchment Area	Unavailable on FEH
Upstream Reach	N/A
Downstream Reach	N/A

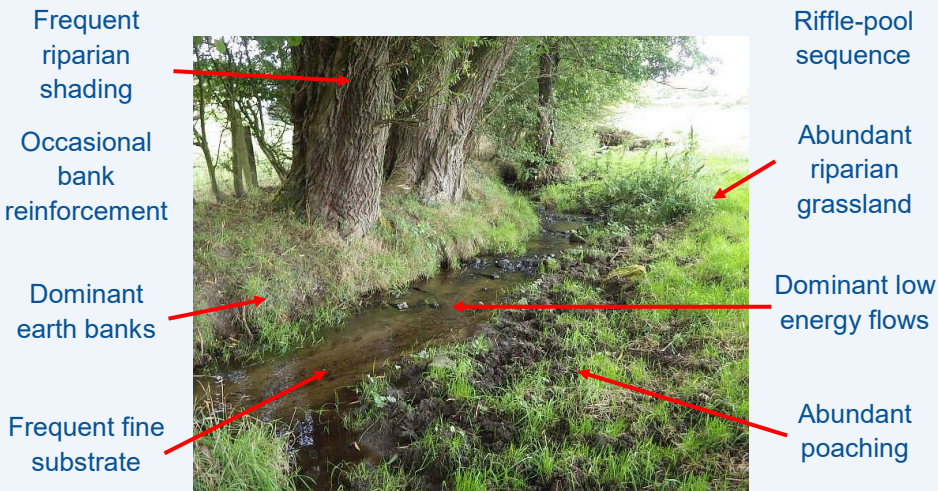
River Flow Regime



	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Qs95	0.79	0.26	67	Summer Major
Qs99	0.79	0.26	67	
Q95	0.79	0.26	67	Winter Major
Q50	0.79	0.26	67	

There are no significant flow additions/reductions associated with this reach

River Habitats



River Water Quality

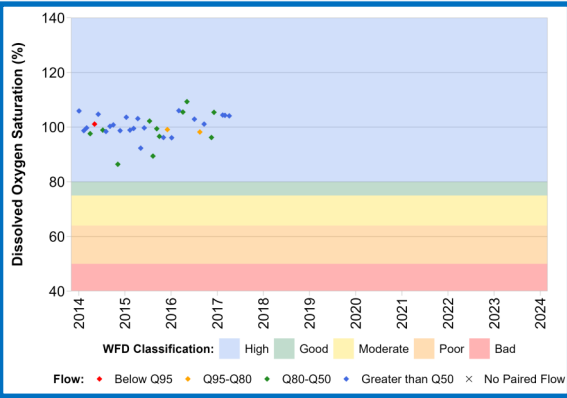
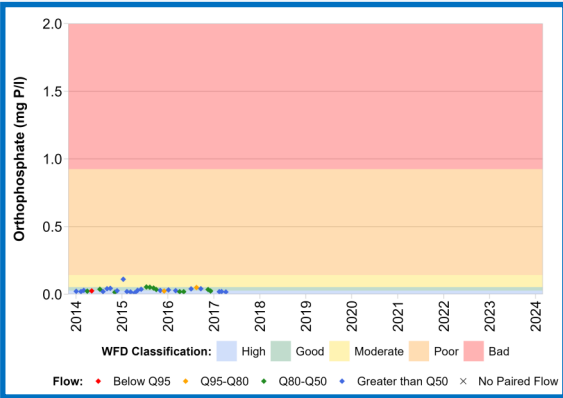
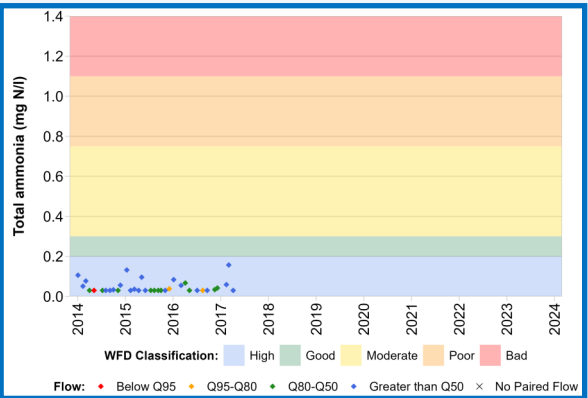
There are no significant water quality pressures associated with this reach

There are no sampling locations in Jum Beck 1, as such the next downstream sampling located in Gill Beck 2, Gill Beck (Baildon) At Otley Road Bridge (NE49400999), has been used as a representative example. The average pH between 2014-2023 was 7.9 with a maximum temperature of 15.1°C for the same period.

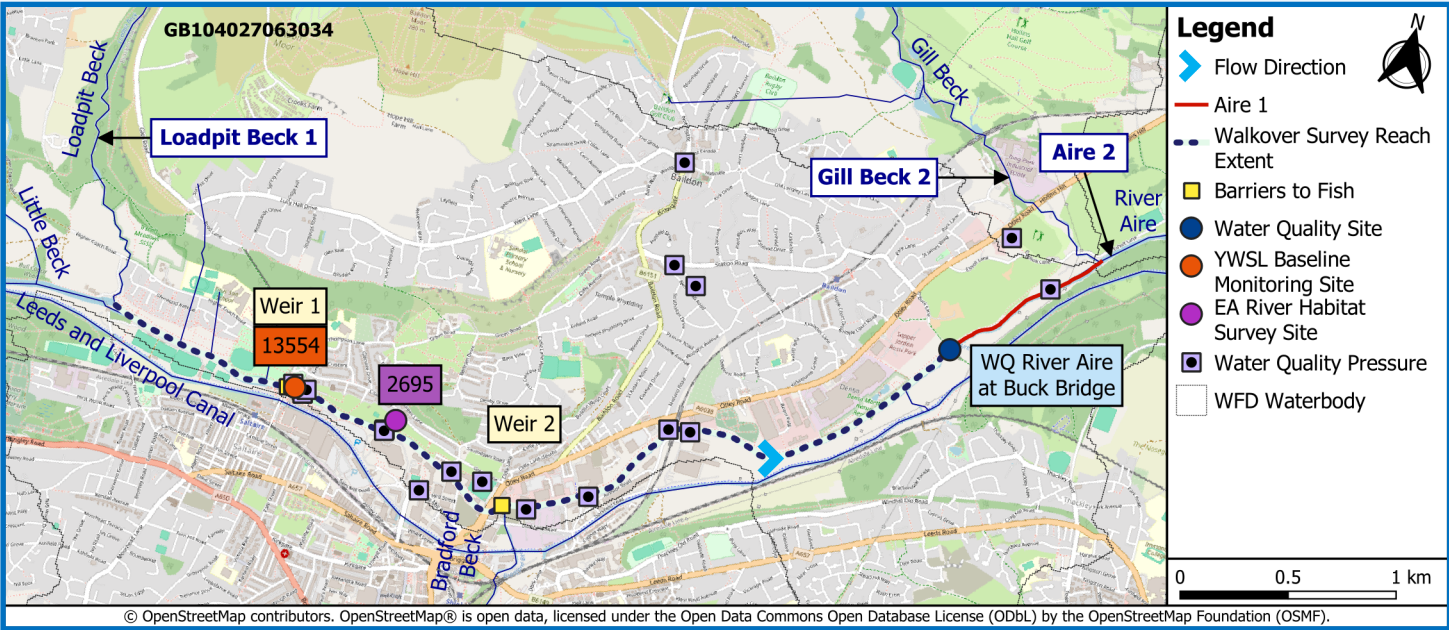


Figure A4.18
Jum Beck 1

Physical Environment Information



Reach Setting

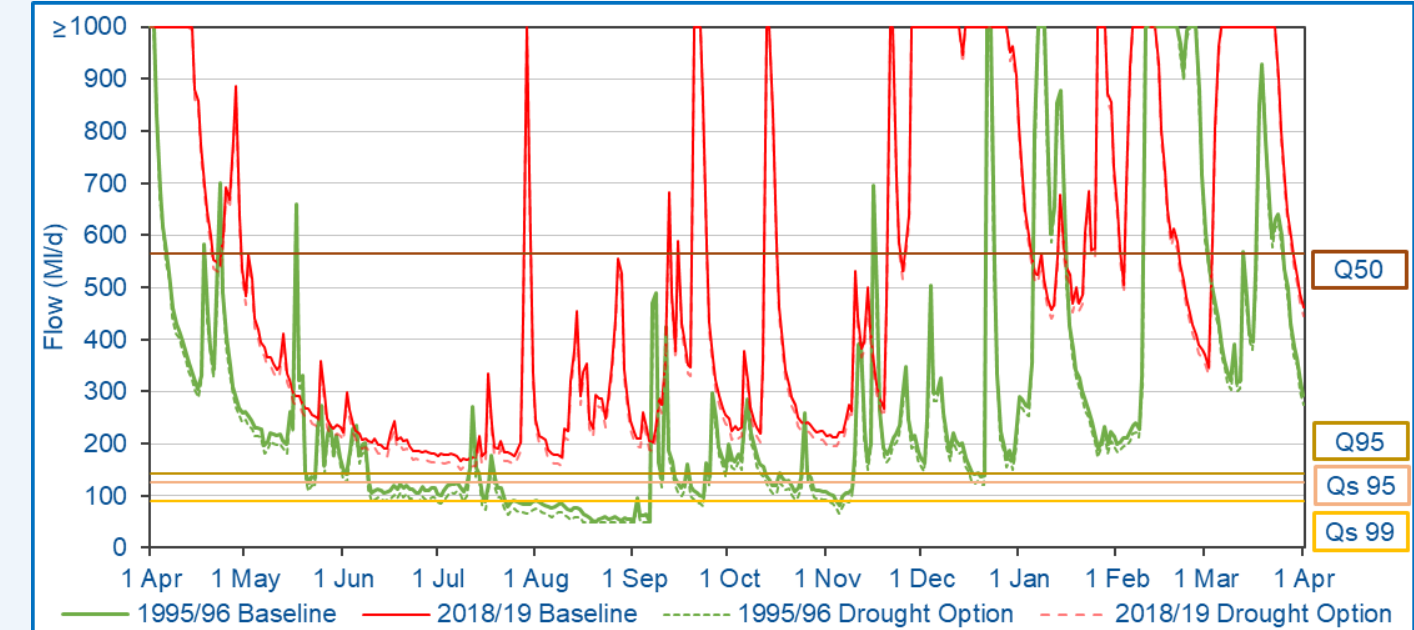


Reach Setting Information:

The superficial geology of the reach is dominated by alluvium and hummocky glacial deposits beneath the channel. Soils in the reservoir catchment are predominantly composed of loamy and clayey floodplain soils directly beneath and around the reach. Parts of the surrounding land use of along the reach is a mixture of suburban/urban land use as the reach flows through Shipley.

	Supplementary Information
Catchment Area at Assessment Point	521.1km ²
Mean Slope Gradient	0.1°
Length of Reach	4.7km
Additional Catchment Area	69.6km ²
Upstream Reach	Loadpit Beck 1
Downstream Reach	River Aire 2

River Flow Regime



	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q _s 95	126	109	13	Summer Moderate
Q _s 99	90.7	74.1	18	
Q95	143	126	12	Winter Minor
Q50	565	548	2.9	

There are no significant flow additions/reductions associated with this reach

River Habitats



River Water Quality

Significant Water Quality Pressures	Permit Conditions
There are 18 CSOs that could be considered intermittent water quality pressures in this reach, each with descriptive consents.	Intermittent discharges

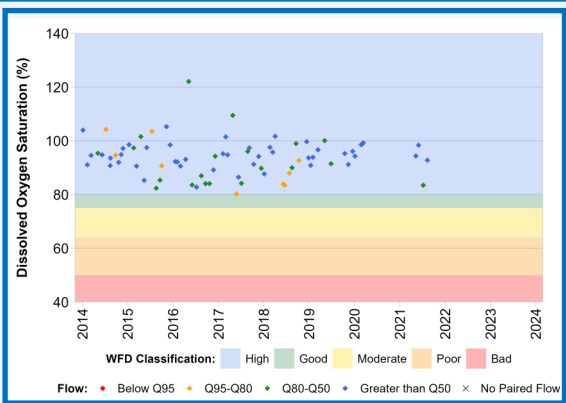
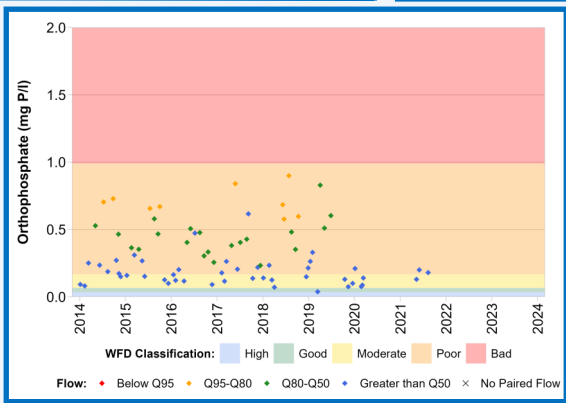
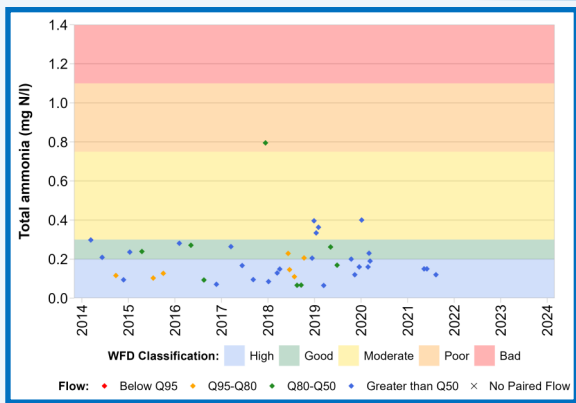
There are three sample locations in Aire 1, the third location, Aire at Buck Bridge (NE49400710), has been used due to its data quality. The average pH between 2014-2023 was 7.9 with a maximum temperature of 20.6°C for the same period.



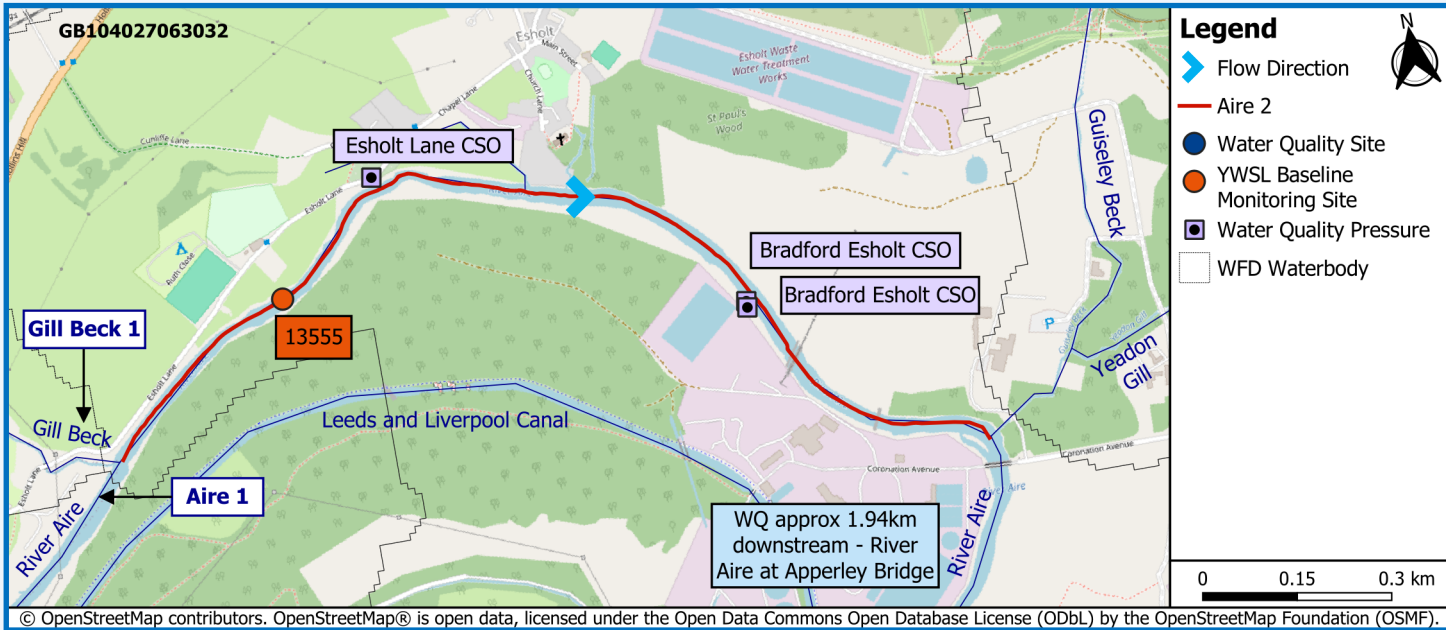
Figure A4.19

River Aire 1

Physical Environment Information



Reach Setting

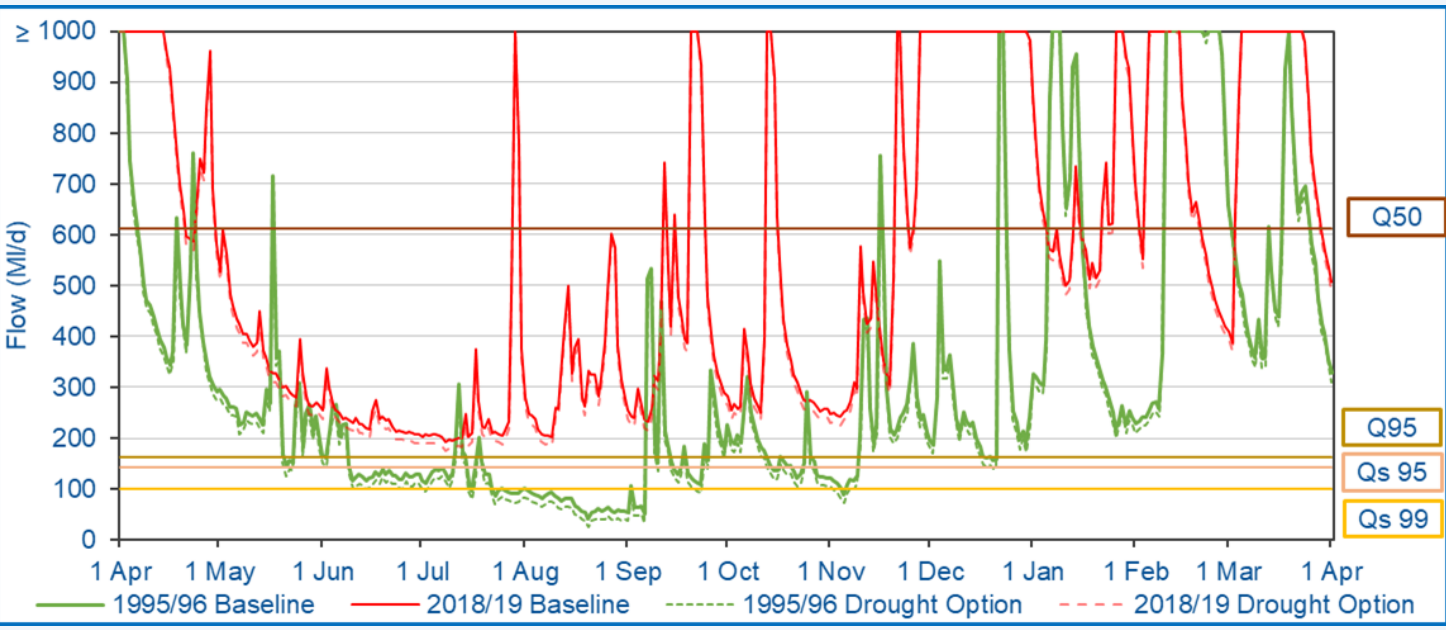


Reach Setting Information:

The superficial geology of the reach is dominated by alluvium beneath the channel with some river terrace deposits around the channel towards the end of the reach. Soils in the reservoir catchment are predominantly composed of loamy and clayey floodplain soils directly beneath and around the reach. There is some suburban/urban land use along the reach, particularly at the end of the reach where Esholt WwTW is located.

	Supplementary Information
Catchment Area at Assessment Point	604.6km ²
Mean Slope Gradient	0.06°
Length of Reach	1.8km
Additional Catchment Area	1.6km ²
Upstream Reach	River Aire 1, Gill Beck 2
Downstream Reach	N/A

River Flow Regime



	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q _s 95	143	127	12	Summer Moderate
Q _s 99	100	82.9	17	
Q95	163	146	10	Winter Minor
Q50	613	596	2.8	

There are no significant flow additions/reductions associated with this reach

River Habitats



River Water Quality

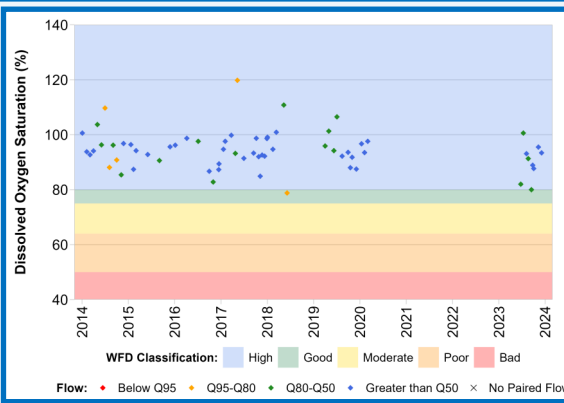
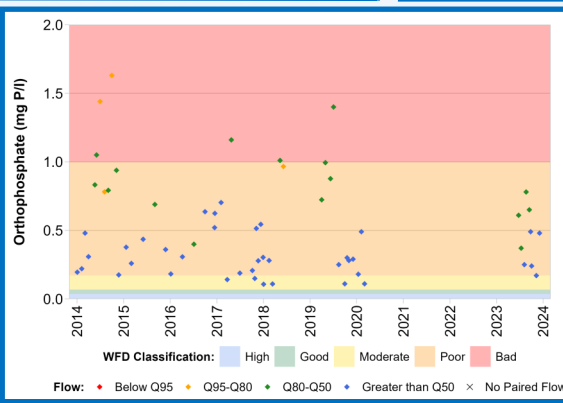
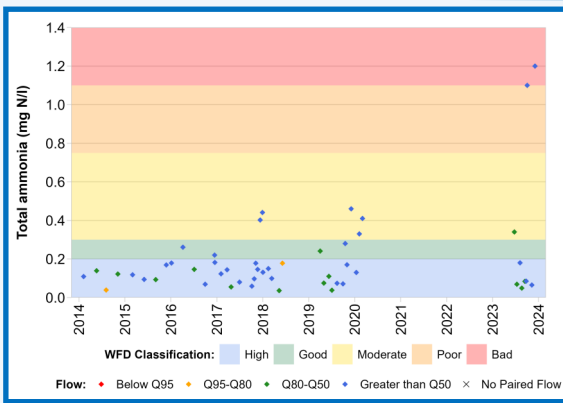
Significant Water Quality Pressures	Permit Conditions
Esholt Lane 291/CSO	Intermittent discharge
Bradford Esholt/NO 2 STW	Intermittent discharge
Bradford Esholt/NO 2 STW	Intermittent discharge

There are no sampling locations in Aire 2, so the next sample downstream of this reach, Aire at Apperley (NE49400676), has been used. The average pH between 2014-2023 was 7.9 with a maximum temperature of 18.3°C for the same period.

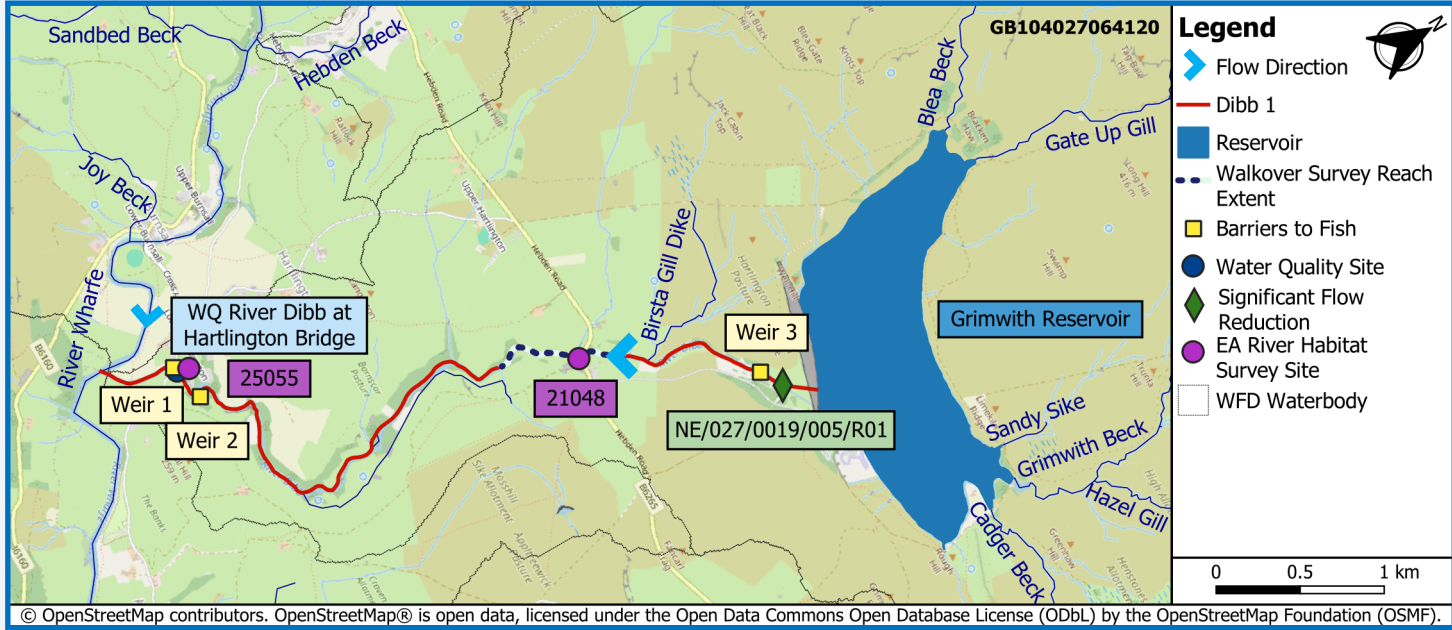


Figure A4.20
River Aire 2

Physical Environment Information



Reach Setting

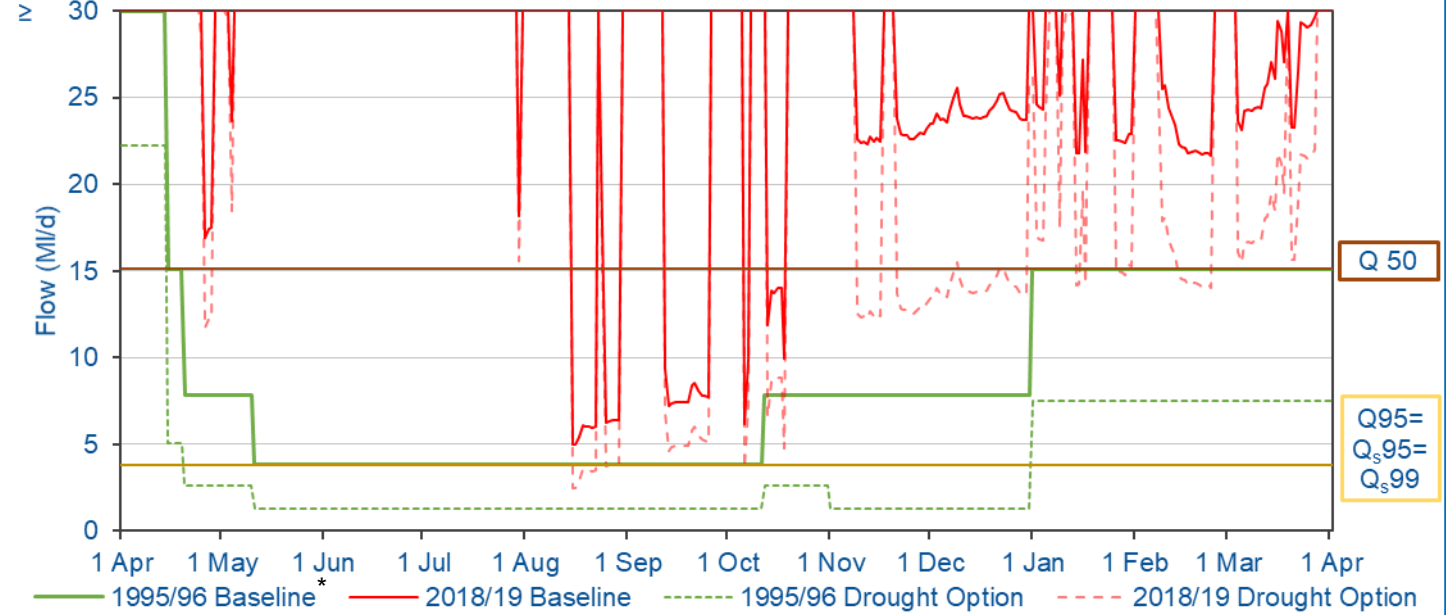


Reach Setting Information:

The bedrock geology of the upstream part of the reach is dominated by the Millstone Grit Group, and downstream is dominated by the Craven Group. The superficial geology is composed predominantly of glacial till. Soils are predominantly composed of very acidic, upland soils with a peat surface, acid loam and clay soils and slightly acid but base rich freely draining soils. At the downstream end of this reach, the River Dobb joins the River Wharfe. Urbanisation is very limited along this reach.

	Supplementary Information
Catchment Area at Assessment Point	25.8km ²
Mean Slope Gradient	1.23°
Length of Reach	5.2km
Additional Catchment Area	9.1km ²
Upstream Reach	N/A
Downstream Reach	N/A

River Flow Regime

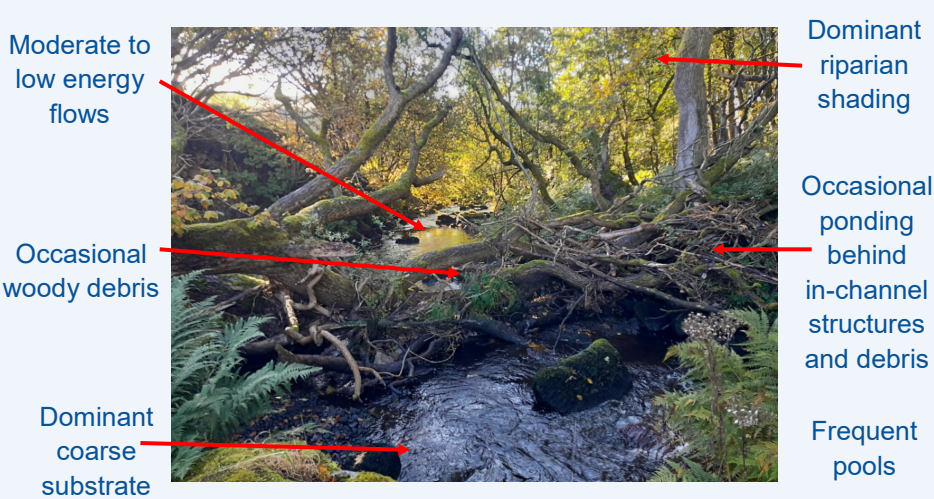
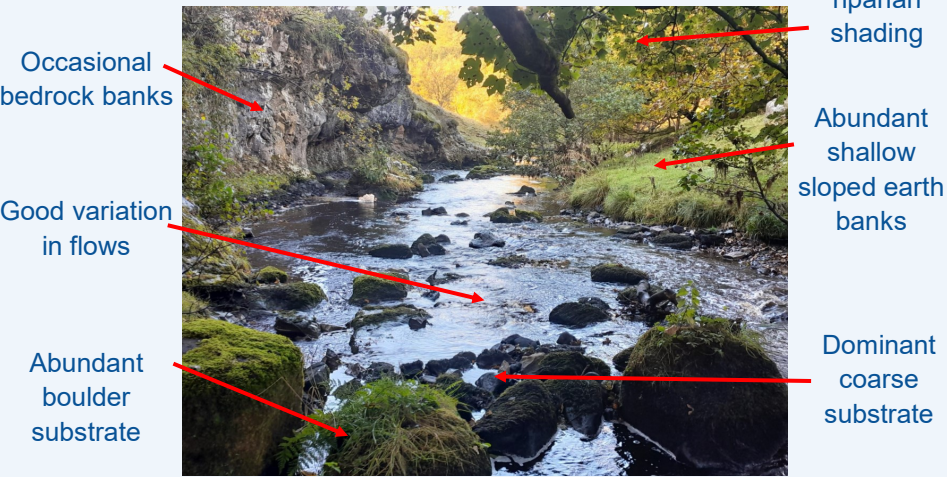


	Reference Conditions (ML/d)	Drought Plan Conditions (ML/d)	% Reduction	Impact
Qs95	3.80	1.25	67	Summer Major
Qs99	3.80	1.25	67	
Q95	3.80	1.25	67	Winter Major
Q50	15.1	4.98	67	

* the regulation regime in 1995/96 is not available and that the line is only a representation of the compensation flow (if it had been in place at that time).

There are no significant flow additions/reductions associated with this reach

River Habitats



River Water Quality

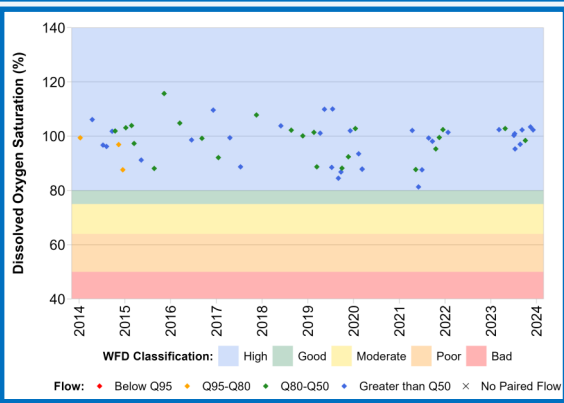
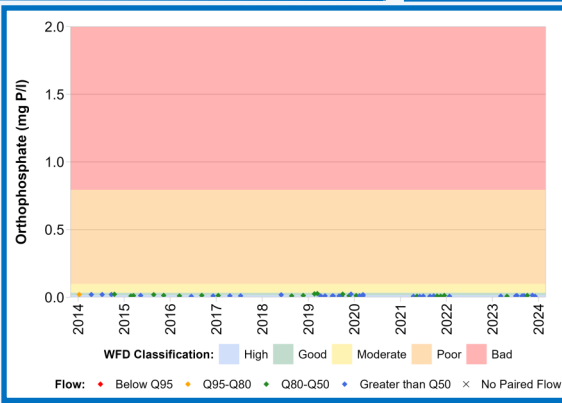
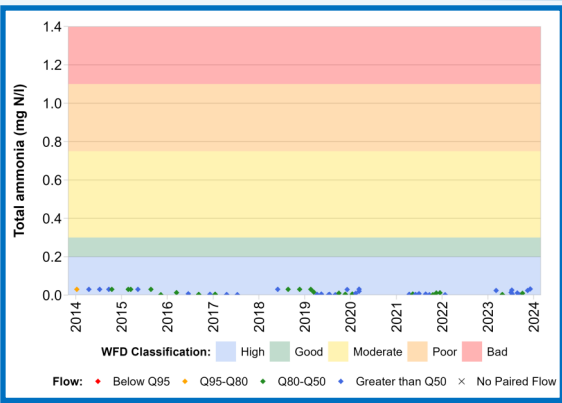
There are no significant water quality pressures associated with this reach

There are two sampling locations in Dibb 1, however the most upstream location, River Dibb at Dibbles Bridge (NE49700222), has limited data, as such, the next sample downstream, River Dibb At Hartlington Bridge (NE49400676), has been used. The average pH between 2014-2023 was 7.9 with a maximum temperature of 17.5°C for the same period.



Figure A4.22
River Dibb 1

Physical Environment Information



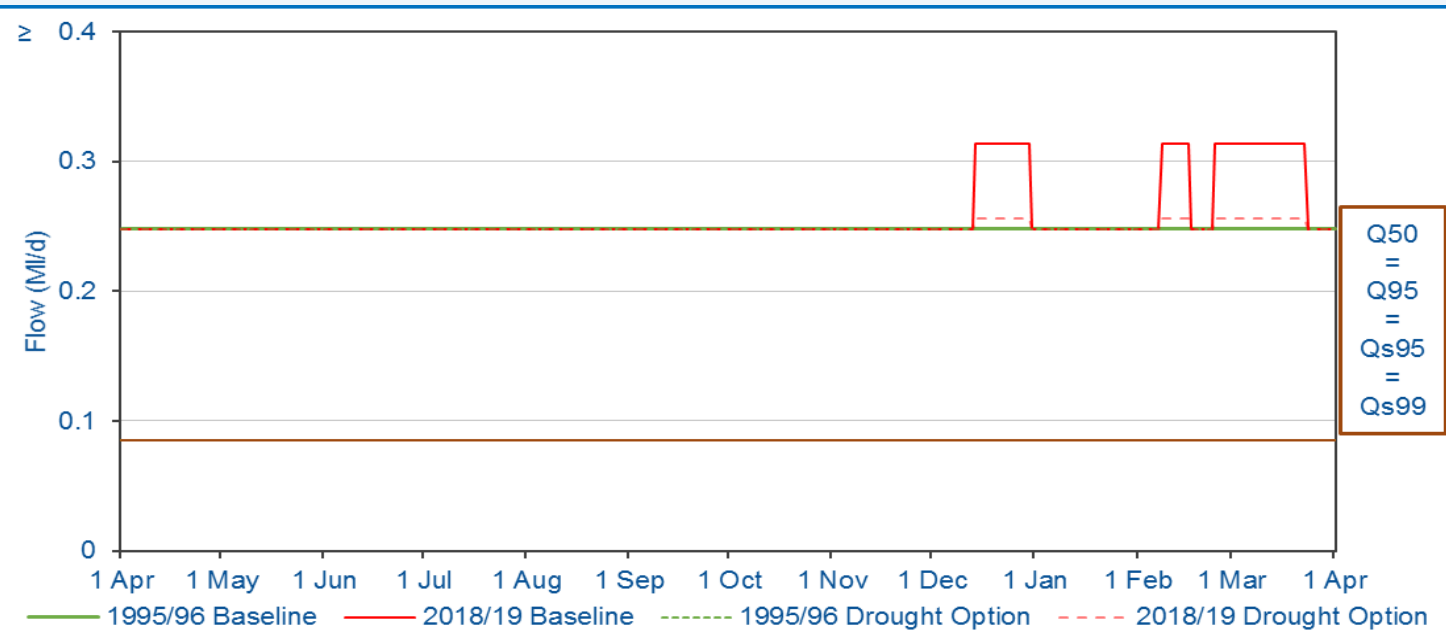
Reach Setting



Reach Setting Information:
The bedrock geology underlying the reach is composed of sandstones and mudstones of the Carboniferous Millstone Grit Group. The superficial geology of the reach is predominantly underlain by glacial till with localised hummocky glacial deposits near the River Wharfe confluence. Soil types along the reach are characterised mostly by seasonally wet base-rich loamy and clay soils. Surrounding land use is characterised by upland heath and improved grassland and some urban land use around the Wharfe confluence.

	Supplementary Information
Catchment Area at Assessment Point	0.5km ²
Mean Slope Gradient	2.36°
Length of Reach	5.1km
Additional Catchment Area	7.0km ²
Upstream Reach	N/A
Downstream Reach	N/A

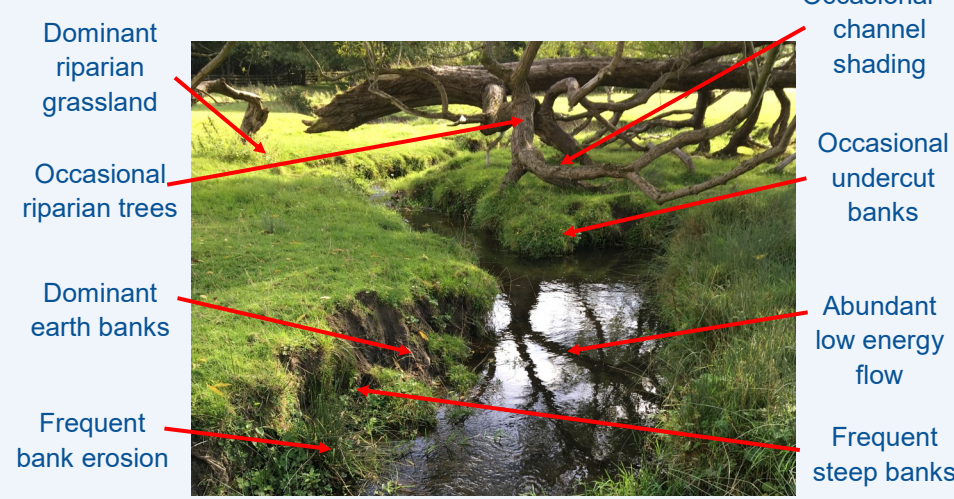
River Flow Regime



	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q _s 95	0.09	0.03	67	Summer Major
Q _s 99	0.09	0.03	67	
Q95	0.09	0.03	67	Winter Major
Q50	0.09	0.03	67	

Significant Flow Additions/Reductions	Flow Rate (MI/d)	Abstraction / Discharge
Otley Golf Course 2/27/19/045	0.025	Abstraction

River Habitats



River Water Quality

There are no significant water quality pressures associated with this reach

There are no monitoring points in this reach. In the comparable Gill Beck 2 catchment the Gill Beck (Baildon) At Otley Road Bridge (NE49400999), has been used. The average pH between 2014-2023 was 7.9 with a maximum temperature of 15.1°C

