

# River Flow Regime 2 8 7 6 905 4 2 2 4 Q50 E Q95 E Q95 E Q95 E Qs95 E Qs95 E Qs95 E Qs95 E Qs95 E Qs96 Dought Option 1995/96 Baseline 2018/19 Baseline ----- 1995/96 Drought Option --- 2018/19 Drought Option

-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q <sub>s</sub> 95	2.70	0.89	67	Summer
Q <sub>s</sub> 99	2.70	0.89	67	Major
Q95	2.70	0.89	67	Winter
Q50	2.70	0.89	67	Major

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

### **Reach Setting Information:**

The bedrock geology is dominated by the Millstone Grit Group. There is no significant superficial geology recorded in or around the reach. Soil types along the reach are composed wholly of slowly permeable, wet very acid upland soils. There is no urbanisation in this reach.

	Supplementary Information
Catchment Area at Assessment Point	7.3km <sup>2</sup>
Mean Slope Gradient	4.4°
Length of Reach	0.6km
<b>Additional Catchment Area</b>	0.14km <sup>2</sup>
Upstream Reach	N/A
Downstream Reach	Graining Water 2

## River Habitats



Frequent exposed boulders

Occasional

anthropogenic features Dominant high energy flows

Abundant steep sided banks Frequent vegetated shallow banks



River Water Quality

There are no significant water quality pressures associated with this reach

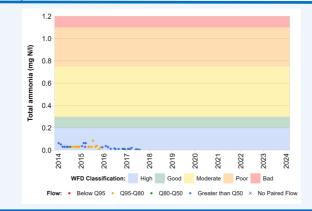
At Graining Water at Blake Dean (NE-49505155), in Graining Water 2, the average pH between 2014-2023 was 7.4 with a maximum temperature of 18.6°C for the same period.

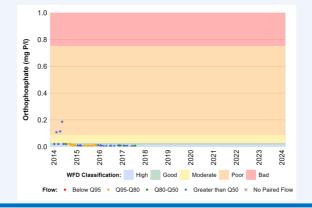
YorkshireWater

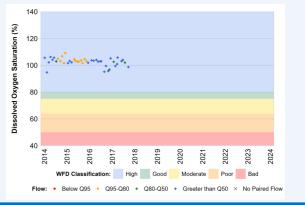


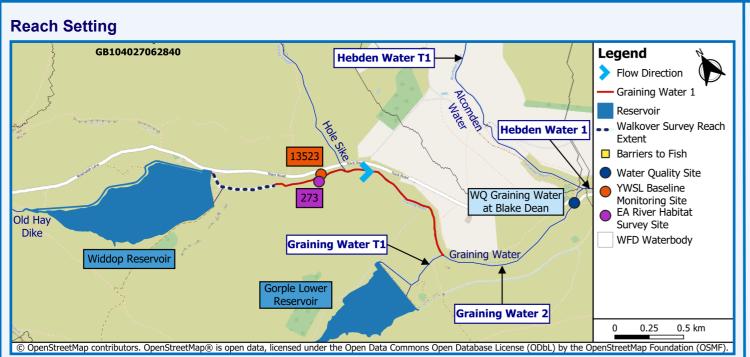
Figure A4.1

**Graining Water T1** 









The superficial geology is very limited with no significant deposits identified. Soil types along the reach vary from very acid, loamy upland soils in the upper sections of the reach near the reservoir outflow, blanket bog peat soils in the mid sections of the reach and slowly permeable, wet, very acid upland soils in the lower sections of the reach. Urbanisation in the reach is very low, with a single residential building at the top of the reach on the left bank.

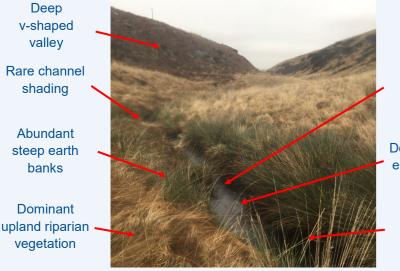
	Supplementary Information
Catchment Area at Assessment Point	3.5km <sup>2</sup>
Mean Slope Gradient	1.2°
Length of Reach	2.2km
<b>Additional Catchment Area</b>	7.5km <sup>2</sup>
Upstream Reach	N/A
Downstream Reach	Graining Water 2

River FI	ow Regime	
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	7 1 1 100000000000000000000000000000000	=
0 -		Q <sub>s</sub> 99
1 A		pr
<b>  </b> 1	995/96 Baseline —— 2018/19 Baseline 1995/96 Drought Option 2018/19 Drought	Option

-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q <sub>s</sub> 95	3.24	1.07	67	Winter
Q <sub>s</sub> 99	3.24	1.07	67	Major
Q95	3.24	1.07	67	Summer
Q50	6.50	2.15	67	Major

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

### River Habitats



Step-pool sequence

Abundant coarse substrate

Dominant low energy flows

Dominant narrow channel



### **River Water Quality**

There are no significant water quality pressures associated with this reach

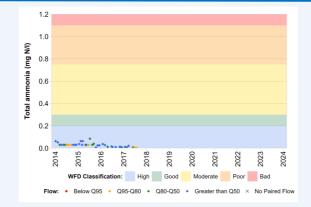
At Graining Water at Blake Dean (NE-49505155), in Graining Water 2, the average pH between 2014-2023 was 7.4 with a maximum temperature of 18.6°C for the same period .

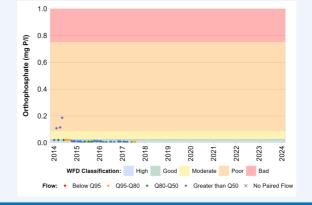


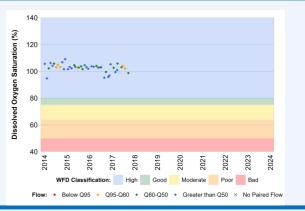


### Figure A4.2

### **Graining Water 1**









### **River Flow Regime** 30 Q 50 20 Q 95 10 Qs 95 Qs 99 1 Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sep 1 Oct 1 Nov 1 Dec 1 Jan 1 Feb 1 Mar 1 Apr - 1995/96 Baseline — -2010/11 Baseline ----- 1995/96 Drought Option ---- 2010/11 Drought Option

-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q <sub>s</sub> 95	7.21	3.23	55	Summer
<b>Q</b> <sub>s</sub> 99	6.54	2.56	61	Major
Q95	7.67	3.04	60	Winter
Q50	21.7	15.5	29	Major

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

### **River Habitats**

urbanisation in the reach.

**Reach Setting Information:** 

The bedrock geology is dominated by the Millstone Grit

beneath or around the reach. Soils in the reach are

Group. There is no significant superficial geology recorded

composed of slowly permeable, wet very acid upland soils

at the immediate start of the reach and very acid, loamy

upland soils constitute the remaining reach. There is no



Occasional iparian trees cover

**Catchment Area at** 

**Assessment Point** 

**Mean Slope Gradient** 

Length of Reach

**Additional Catchment Area** 

**Upstream Reach Downstream Reach** 

> Occasional bank einforcement

> > **Dominant** coarse substrate

Step-pool sequence



18.4km<sup>2</sup>

1.2°

1.4km

1.3km<sup>2</sup>

Graining Water T1/ Graining Water

Hebden Water 1

**River Water Quality** 

There are no significant water quality pressures associated with this reach

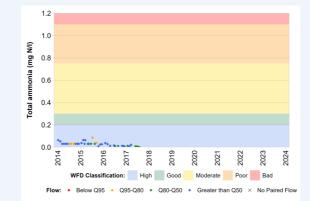
At Graining Water at Blake Dean (NE-49505155) the average pH between 2014-2023 was 7.4 with a maximum temperature of 18.6°C for the same period.

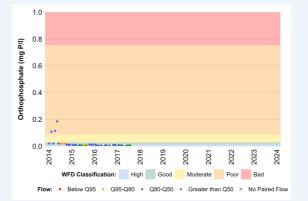
YorkshireWater

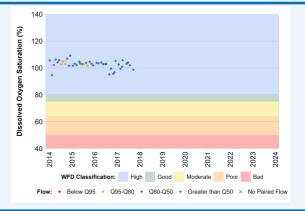


## Figure A4.3

**Graining Water 2** 









# River Flow Regime 220 16 Q 50 Q 50 Q 50 Q 50 Q 50 Q 50 Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sep 1 Oct 1 Nov 1 Dec 1 Jan 1 Feb 1 Mar 1 Apr 1995/96 Baseline 2018/19 Baseline 2018/19 Baseline ----- 1995/96 Drought Option --- 2018/19 Drought Option

-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q <sub>s</sub> 95	3.78	1.25	67	Summer
Q <sub>s</sub> 99	3.78	1.25	67	Major
Q95	3.78	1.25	67	Winter
Q50	7.56	2.49	67	Major

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

### **Reach Setting Information:**

The bedrock geology is dominated by the Millstone Grit Group and superficial geology is very limited with only limited deposits of alluvium along the reach. Soil types along the reach are composed predominantly of slowly permeable, wet very acid upland soils. There is no urbanisation along this reach.

	Supplementary Information
Catchment Area at Assessment Point	9.5km <sup>2</sup>
Mean Slope Gradient	2.2°
Length of Reach	2.0km
Additional Catchment Area	1.9km <sup>2</sup>
Upstream Reach	N/A
Downstream Reach	Hebden Water 1

### **River Habitats**

No walkover survey was carried out during the onset of drought in 2018 along this reach. This will be included in the EMP.

### **River Water Quality**

There are no significant water quality pressures associated with this reach

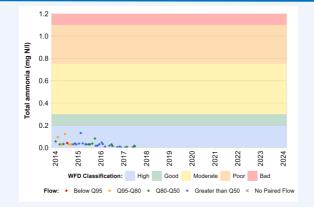
At Alcomden Water at Footbridge (NE-49505156) the average pH between 2014-2023 was 7.6 with a maximum temperature of 17.4°C for the same period.

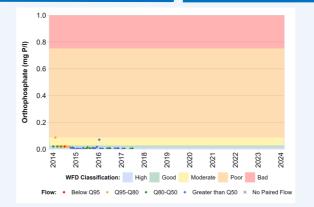


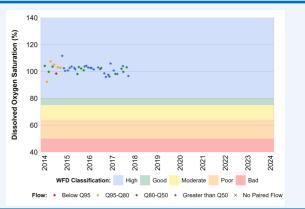


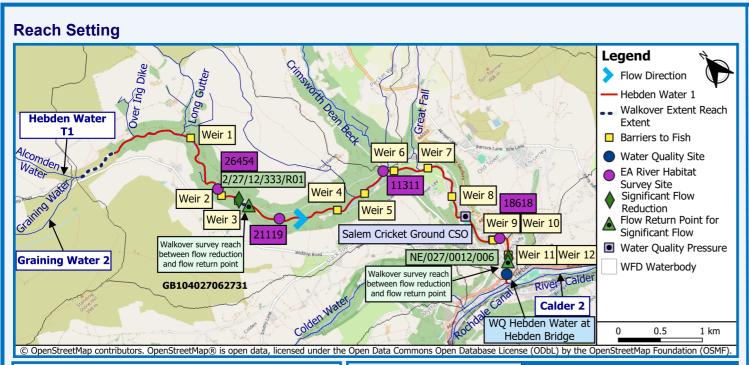
## Figure A4.4

Hebden Water T1





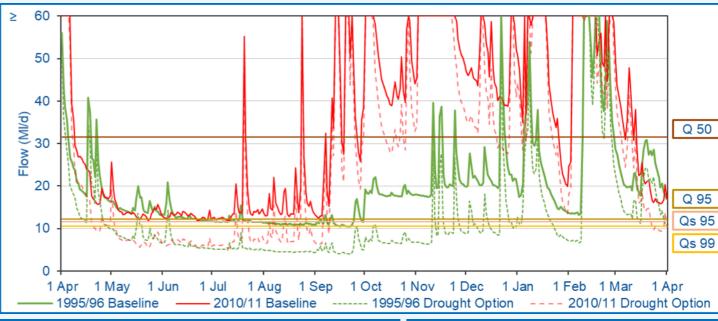




The bedrock geology is dominated by the Millstone Grit Group and superficial geology is predominantly composed of alluvium along the channel path with some spatially limited head deposits around the mid sections of the reach. Soil types along the reach are very acid, loamy upland soils (with a peaty surface). This reach becomes more urbanised towards it's end where it flows through Hebden Bridge.

	Supplementary Information	
Catchment Area at Assessment Point	31.1km <sup>2</sup>	
Mean Slope Gradient	1.0°	
Length of Reach	7.5km	
<b>Additional Catchment Area</b>	27.9km <sup>2</sup>	
Upstream Reach	Graining Water 2/ Hebden Water T1	
Downstream Reach	River Calder 2	

### **River Flow Regime**



-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q <sub>s</sub> 95	11.6	5.06	56	Summer
Q <sub>s</sub> 99	10.6	4.09	61	Major
Q95	12.2	5.07	53	Winter
Q50	31.6	20.3	36	Major

Significant Flow Additions/Reductions	Flow Rate (MI/d)	Abstraction / Discharge
HEBDEN WATER- HARCASTLE CRAGS- HEBDEN BRIDGE 2/27/12/333/R01	35.43	Abstraction
BRIDGE MILL GOYT - BRIDGE MILL- NE/027/0012/006	69.984	Abstraction

# Occasional vegetated mid-channel bars Rare woody debris Dominant coarse substrate

Dominant steep sided valley

Abundant low and moderate energy flows

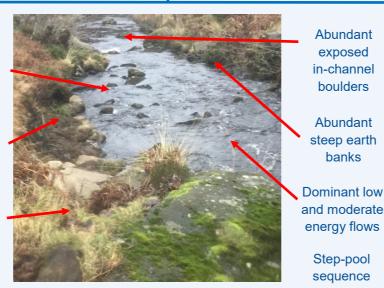
Dominant exposed in-channel boulders

Step-pool sequence

Dominant coarse substrate

Rare bank erosion

Dominant coarse substrate



River Water Quality

Significant Water Quality
Pressures

Salem Cricket Ground/ CSO WRA8419 1 **Permit Conditions** 

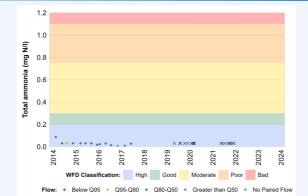
Intermittent discharge

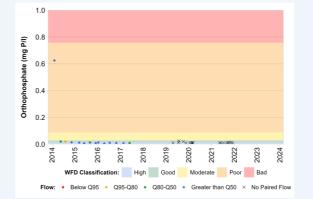
At Hebden Water At Hebden Bridge (NE-49500377) the average pH between 2014-2023 was 7.6 with a maximum temperature of 18.4°C for the same period.

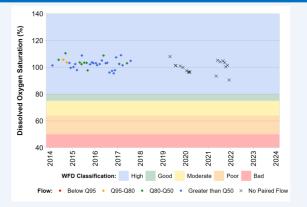
# YorkshireWater

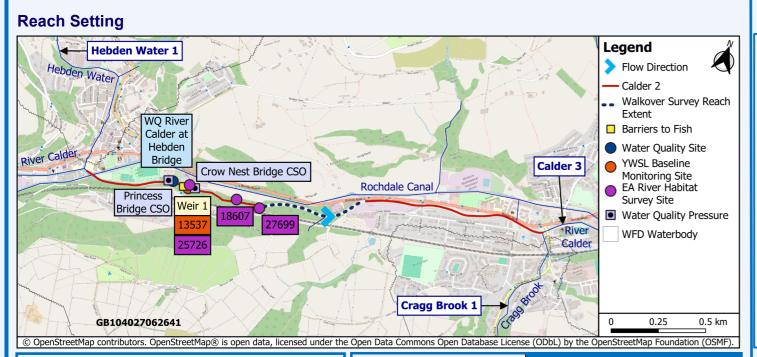


Figure A4.5
Hebden Water 1









# 250 200 200 150 100 100 100 1 Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sep 1 Oct 1 Nov 1 Dec 1 Jan 1 Feb 1 Mar 1 Apr 1995/96 Baseline 2010/11 Baseline ------ 1995/96 Drought Option --- 2010/11 Drought Option

-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q <sub>s</sub> 95	53.5	47.0	12	Summer
<b>Q</b> <sub>s</sub> 99	40.5	34.0	16	Moderate
Q95	59.7	48.8	19	Winter
Q50	181	170	6	Minor

**River Flow Regime** 

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

### **Reach Setting Information:**

The bedrock geology is dominated by the Millstone Grit Group and superficial geology is composed of alluvium along the channel path with scattered glaciofluvial deposits, particularly near the end of the reach. Soil types along the reach are freely draining, slightly acid loamy soils. This is a highly urbanised reach flanked by Hebden Bridge and Mytholmroyd.

	Supplementary Information
Catchment Area at Assessment Point	142.4km <sup>2</sup>
Mean Slope Gradient	0.1°
Length of Reach	2.5km
<b>Additional Catchment Area</b>	4.5km <sup>2</sup>
Upstream Reach	Hebden Water 1
Downstream Reach	Calder 3

### **River Habitats**

Abundant anthropogenic influence

Dominant reinforced banks

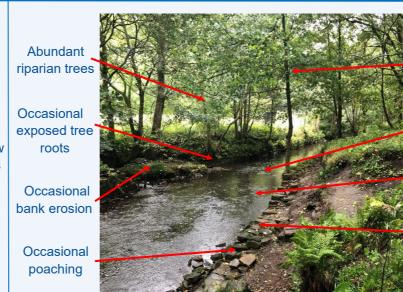
Occasional side bars

Occasional in-channel debris

Frequent riparian tree cover

Dominant low energy flows

Occasional protruding boulders



Frequent channel

Abundant coarse substrate

shading

Dominant low energy flows

Abundant bank reinforcement

### **River Water Quality**

Significant Water Quality Pressures	Permit Conditions	
Crow Nest Bridge CSO	Intermittent discharge	
Princess Bridge NO 2 CSO	Intermittent discharge	

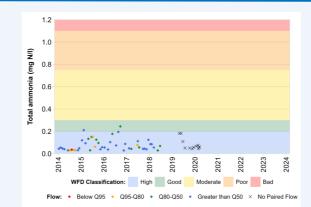
At River Calder At Hebden Bridge (NE-49500612) the pH between 2014-2023 was 7.7 and the max temperature was 19.1°C for the same period.

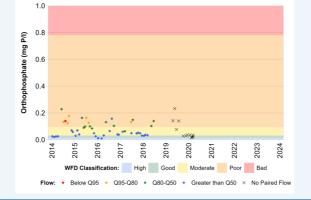


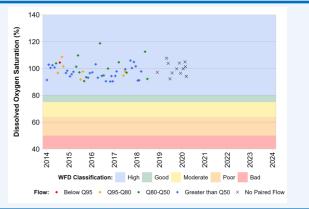


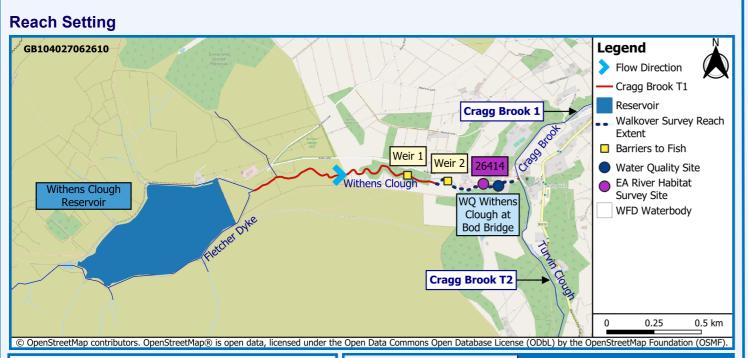
Figure A4.6

**River Calder 2** 









### **Supplementary Information Reach Setting Information: Catchment Area at** Bedrock geology is dominated by Millstone Grit lithologies 5.0km<sup>2</sup> **Assessment Point** (mudstone, sandstone and siltstone) and no significant superficial deposits have been identified in and around the 3.5° **Mean Slope Gradient** reach. Soils in the reservoir catchment are predominantly

1.6km Length of Reach 1.6km<sup>2</sup> **Additional Catchment Area** N/A **Upstream Reach Downstream Reach** Cragg Brook 1

River Flow Regime	
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-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q <sub>s</sub> 95	2.64	0.87	67	Summer
Q <sub>s</sub> 99	2.64	0.87	67	Major
Q95	2.64	0.87	67	Winter
Q50	2.64	0.87	67	Major

bank

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

### **River Habitats**

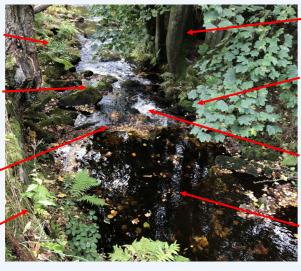
reach passes through Cragg Vale.

**Abundant** steep, vegetated banks

Occasional in-channel boulders

**Dominant** coarse substrate

Abundant reinforced banks



composed of very acid, loamy upland soils. Urbanisation in

the reach is very limited although some buildings are

present on the left bank at the end of the reach as the

**Abundant** parian tree cover

> **Abundant** channel shading

Frequent moderate energy flows

Abundant low energy flows



energy flows Occasional in-channel

barriers



**River Water Quality** Abundant

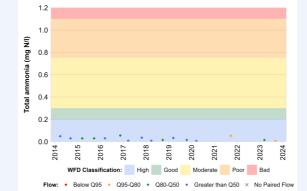
> There are no significant water quality pressures associated with this reach

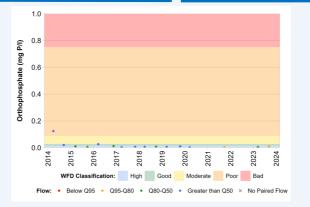
At Withens Clough at Bod Bridge (NE-49505157) the average pH between 2014-2025 was 7.3 with a maximum temperature of 16.6°C for the same period.

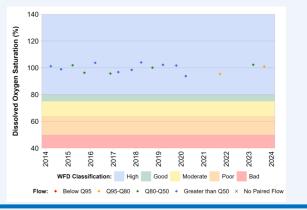




Figure A4.7 **Cragg Brook T1** 

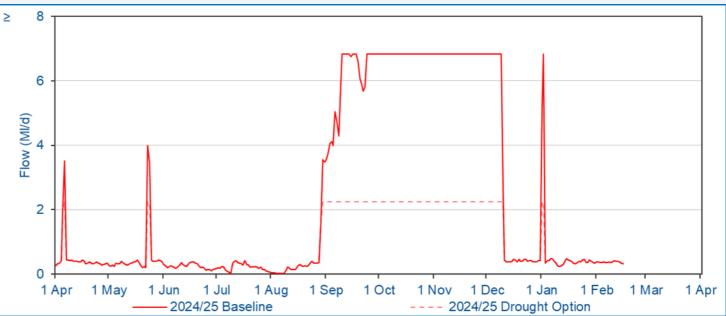








### River Flow Regime



Reduction in flows by up to 67% at times when abstraction is occurring. Potential for a **major** hydrological impact at any time of year noting that the lowest natural flows are protected by the prescribed flow condition.

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

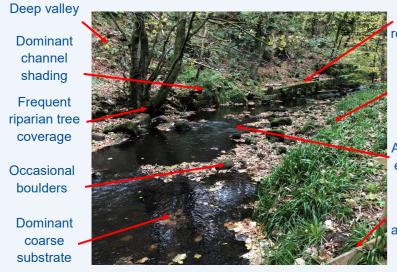
### **River Habitats**

deposits identified. Soil types along the reach are

at the confluence with Withens Clough.

composed predominantly of very acid, loamy upland soils.

Some suburban/urban land use is present on the left bank



Occasional bank reinforcement

**Assessment Point** 

**Mean Slope Gradient** 

Length of Reach

**Additional Catchment Area** 

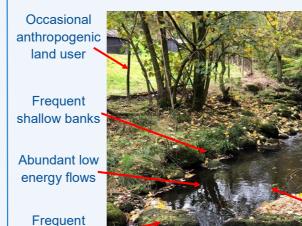
Upstream Reach

Downstream Reach

Frequent, shallow vegetated banks

Abundant low energy flows

Occasional anthropogenic modification



3.2°

2.6km

8.9km<sup>2</sup>

N/A

Cragg Brook 1

Dominant iparian tree cover and shading

Occasional moderate energy flows

Occasional exposed tree roots

Dominant coarse substrate

### **River Water Quality**

There are no significant water quality pressures associated with this reach

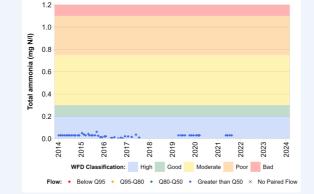
At Cragg Brook At Mytholmroyd (NE-49500145) the average pH between 2014-2023 was 7.75 with a maximum temperature of 18.2°C for the same period.





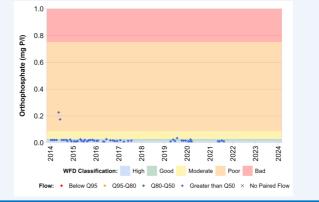
Figure A4.8
Cragg Brook T2

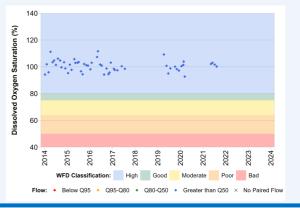
**Physical Environment Information** 

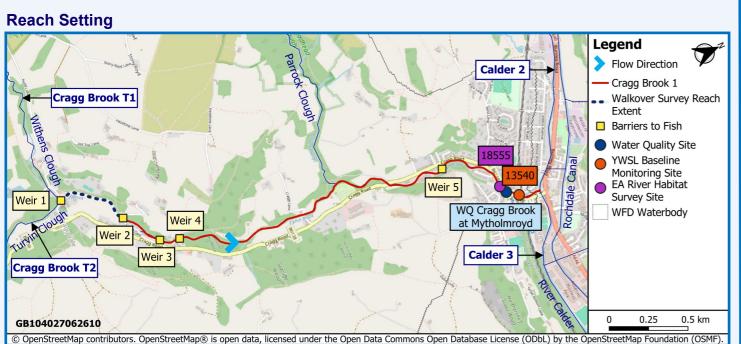


protruding

boulders



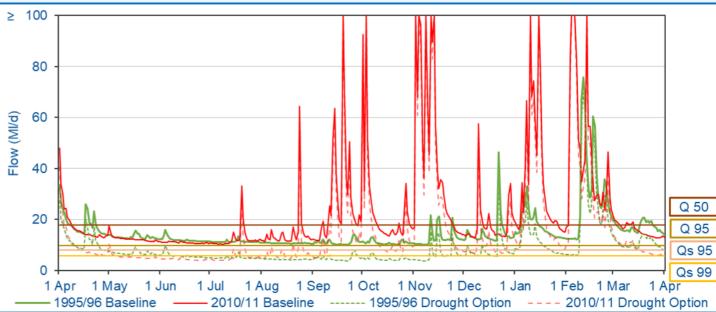




The superficial geology is limited to alluvium beneath the channel and scattered head deposits around the channel. Soil types along the reach are composed predominantly of very acid, loamy upland soils in the upper section of the reach with freely draining, slightly acid loamy soils in the lower sections of the reach. Urbanisation is variable along the reach becoming dominant as the channel flows through Mytholmroyd ~2.5km downstream.

	Supplementary Information
Catchment Area at Assessment Point	19.4km <sup>2</sup>
Mean Slope Gradient	1.2°
Length of Reach	3.6km
<b>Additional Catchment Area</b>	6.7km <sup>2</sup>
Upstream Reach	Cragg Brook T1/T2
Downstream Reach	River Calder 3

### River Flow Regime



-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
<b>Q</b> <sub>s</sub> 95	11.0	4.64	58	Summer
Q <sub>s</sub> 99	10.3	3.92	62	Major
Q95	11.3	4.96	56	Winter
Q50	18.4	12.1	34	Major

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

### **River Habitats**

No walkover survey was carried out during the onset of drought in 2018 along this reach. This will be included in the EMP.

### **River Water Quality**

There are no significant water quality pressures associated with this reach

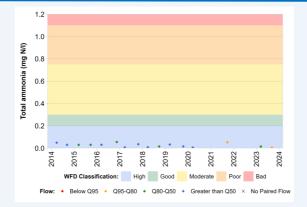
At Cragg Brook At Mytholmroyd (NE-49500145) the average pH between 2014-2023 was 7.75 with a maximum temperature of 18.2°C for the same period.

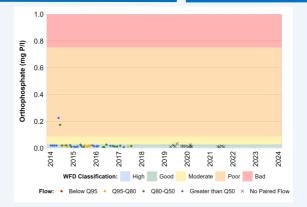


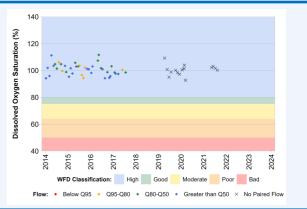


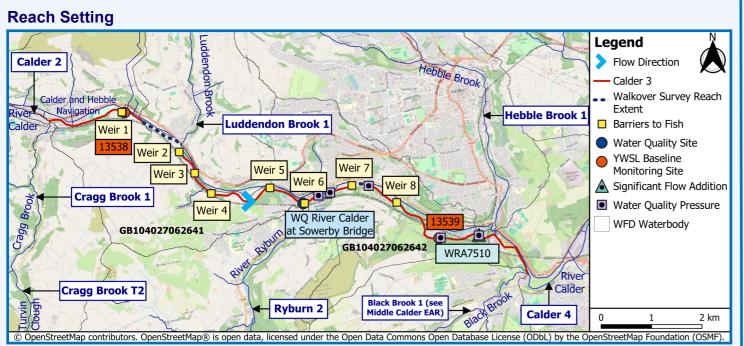
Figure A4.9

**Cragg Brook 1** 





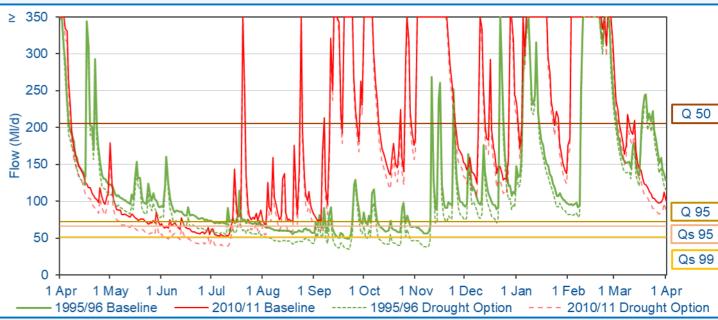




The bedrock geology is dominated by lithologies of the Millstone Grit Group (mudstone, sandstone and siltstone) and superficial geology is composed predominantly of alluvium beneath the channel with some scattered alluvial fan deposits in the lower sections of the reach. Soil types along the reach are composed of freely draining, slightly acid loamy soils. Surrounding land use is predominately urbanised with occasional areas of improved grassland.

	Supplementary Information
Catchment Area at Assessment Point	173.0km <sup>2</sup>
Mean Slope Gradient	0.1°
Length of Reach	11.8km
<b>Additional Catchment Area</b>	130.3km <sup>2</sup>
Upstream Reach	River Calder 2/ Cragg Brook 1
Downstream Reach	Calder 4 (see Middle Calder EAR)

### River Flow Regime



-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
Q <sub>s</sub> 95	66.1	53.3	19	Summer
Q <sub>s</sub> 99	51.7	38.9	25	Moderate
Q95	73.0	55.4	24	Winter
Q50	207	189	8	Minor

Significant Flow Additions/Reductions	Flow Rate (MI/d)	Abstraction / Discharge
Halifax STW	57.7	Discharge
WRA7510	(DWF)	Discharge

### **River Habitats**

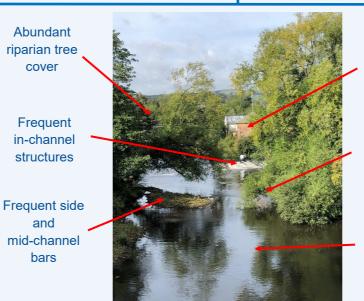


Occasional bank erosion

Occasional shallow margins

Dominant low energy flows

Frequent channel shading



Abundant bank modification

Frequent channel shading

Dominant low-energy flows

### **River Water Quality**

Significant Water Quality Pressures

There are 6 CSOs that could be considered intermittent water quality pressures in this reach, each with descriptive consents. **Permit Conditions** 

Intermittent discharges

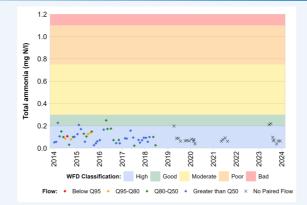
At River Calder at Sowerby Bridge (NE-49500625) the average pH between 2014-2024 was 7.7 with a maximum temperature of 20.4°C for the same period.

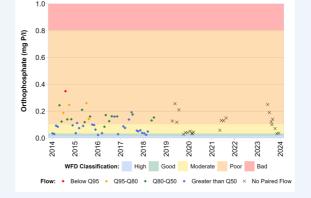


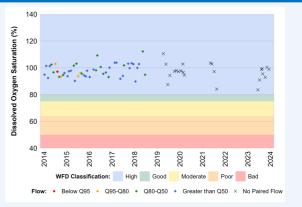


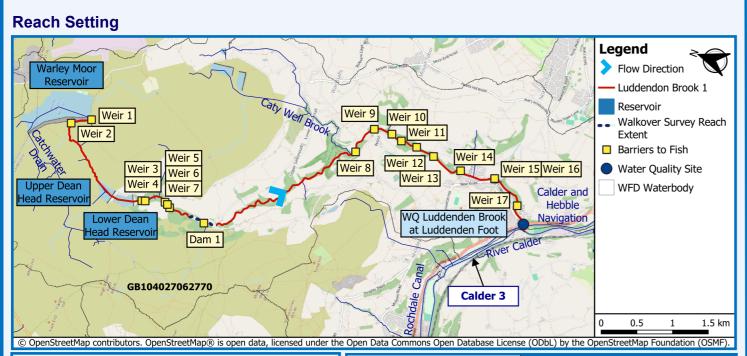
Figure A4.10

**River Calder 3** 









### **Supplementary Information Catchment Area at** $2.4 \text{km}^2$ **Assessment Point** 2.0° **Mean Slope Gradient** There are also spatially-limited deposits of head around the Length of Reach 9.1km **Additional Catchment Area** 19.3km<sup>2</sup> N/A **Upstream Reach**

River Calder 3

# **River Flow Regime** ≥ 8 Q50 Q95 **Qs95** Qs99

1 Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sep 1 Oct 1 Nov 1 Dec 1 Jan 1 Feb 1 Mar 1 Apr

-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
<b>Q</b> <sub>s</sub> 95	3.02	1.00	67	Summer
<b>Q</b> <sub>s</sub> 99	3.02	1.00	67	Major
Q95	3.02	1.00	67	Winter
Q50	3.02	1.00	67	Major

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

### **River Habitats**

Foot.

Reach Setting Information:

The bedrock geology is dominated by the Millstone Grit

alluvium beneath the channel, mostly in its lower sections.

reach. Soil types in the upper to mid sections of the reach

~7.3km downstream when the channel passes Luddenden

are composed predominantly of very acid, loamy upland

soils with freely draining, slightly acid loamy soil in the lower sections of the reach. Urbanisation is low until

Group and superficial geology is limited to deposits of



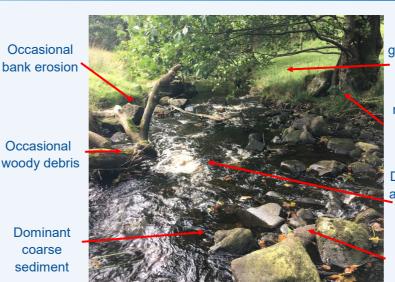
Occasional inthropogenic influence

**Downstream Reach** 

Occasional woody debris

Abundant gently sloping banks

Occasional finer marginal substrate



**Abundant** gently sloping banks

Frequent

1995/96 Baseline —

riparian tree cover and shading

**Dominant low** and moderate flows

> **Dominant** exposed boulders

### **River Water Quality**

There are no significant water quality pressures associated with this reach

- 2018/19 Baseline ----- 1995/96 Drought Option --- 2018/19 Drought Option

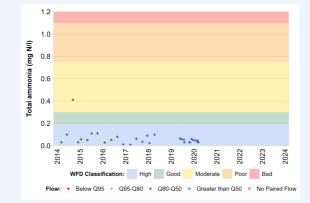
At Luddenden Brook At Luddenden Foot (NE-49500499) the average pH between 2014-2023 was 7.8 with a maximum temperature of 18.7°C for the same period.

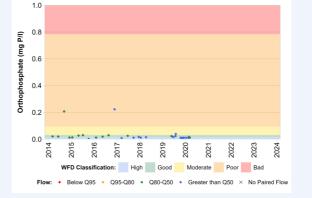


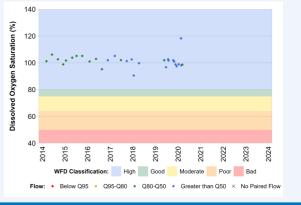


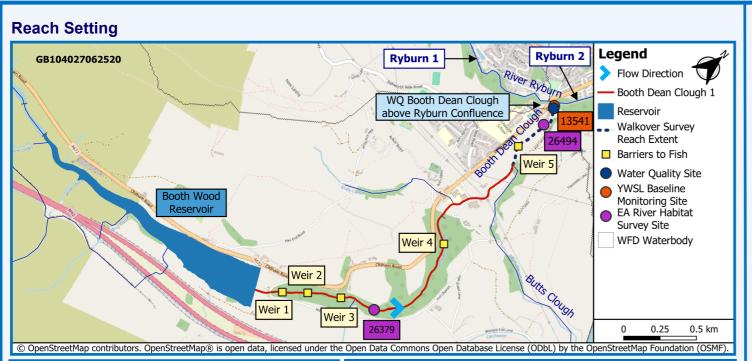
Figure A4.11

Luddenden Brook 1









The bedrock geology is dominated by lithologies of the Millstone Grit Group (mudstone, sandstone and siltstone). For the upstream 2.5km of the reach superficial geology is very limited with peat and head deposits identified and for the last 0.5km superficial geology is composed of alluvium beneath the channel with scattered river terrace deposits. Soil types along the reach are composed of freely draining, slightly acid loamy soils. Urbanisation increases towards the end of the reach as the channel enters Ripponden.

	Supplementary Information
Catchment Area at Assessment Point	15.4km <sup>2</sup>
Mean Slope Gradient	1.6°
Length of Reach	3.0km
<b>Additional Catchment Area</b>	4.7km <sup>2</sup>
Upstream Reach	N/A
Downstream Reach	Ryburn 2

### 

-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact
<b>Q</b> <sub>s</sub> 95	3.41	1.13	67	Summer
<b>Q</b> <sub>s</sub> 99	3.41	1.13	67	Major
Q95	3.41	1.13	67	Winter
Q50	3.41	1.13	67	Major

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

### **River Habitats**

Dominant riparian shading

Occasional emergent macrophytes

Frequent shallow margins

Abundant shallow and steep earth banks

Dominant low

energy flows

**Abundant** 

coarse

w and riparian earth shading nks

Abundant coarse substrate

Dominant

Occasional bars

substrate Occasional anthropoOccasional genic features



Occasional steep banks

Occasional undercutting

Abundant coarse substrate

Abundant low energy flows

### **River Water Quality**

There are no significant water quality pressures associated with this reach

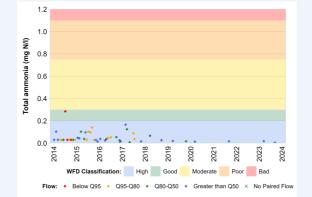
At Booth Dean Clough Above Ryburn Conf (NE-49505154) the average pH between 2014-2023 was 7.6 with a maximum temperature of 14.4°C for the same period.

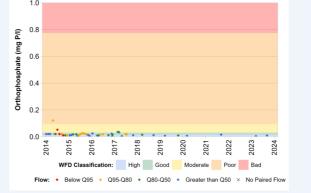


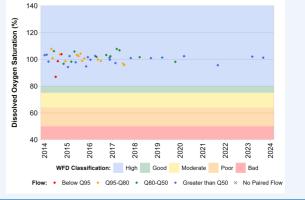


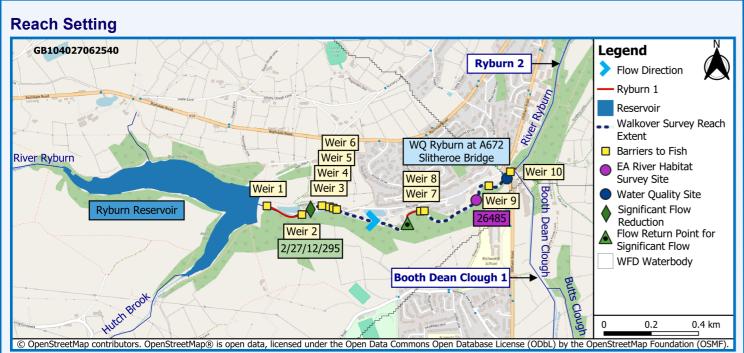
Figure A4.12

Booth Dean Clough 1









### **Supplementary Information Reach Setting Information: Catchment Area at** The bedrock geology is dominated by lithologies of the 12.7km<sup>2</sup> Millstone Grit Group (mudstone, sandstone and siltstone) **Assessment Point** and superficial geology is limited with alluvium identified 1.1° **Mean Slope Gradient** beneath the channel and some peat. Soil types along the 1.4km Length of Reach reach are composed of freely draining, slightly acid loamy soils. Land use is predominantly urban, especially along the 1.2km<sup>2</sup> **Additional Catchment Area** left bank as the channel passes through Ripponden. N/A **Upstream Reach**

**Downstream Reach** 

Frequent

roots

cposed tree

River F	low Regime	
≥15 ·		
12 · (p/l/	The same of the sa	
Flow (Ml/d)	Maria	Q50 =
3 -	" I Show the Sall - weather find	Q95 = Qs95 =
0 -		Qs99
	Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sep 1 Oct 1 Nov 1 Dec 1 Jan 1 Feb 1 Mar 1 A 1995/96 Baseline —— 2018/19 Baseline 1995/96 Drought Option 2018/19 Drought	

-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact	
Q <sub>s</sub> 95	5.90	1.95	67	Summer	
Q <sub>s</sub> 99	5.90	1.95	67	Major	
Q95	5.90	1.95	67	Winter	
Q50	5.90	1.95	67	Major	

Significant Flow Additions/Reductions	Flow Rate (MI/d)	Abstraction / Discharge
RIVER RYBURN (Fish farm) 2/27/12/295	1.36	Abstraction

# River Habitats Frequent bank

reinforcement

Dominant protruding - boulders

Dominant coarse - sediment

Frequent riparian shading

Good flow diversity



River Ryburn 2

River Water Quality

Significant Water Quality
Pressures

Permit Conditions

RIVER RYBURN fish farm
(No discharge permit)

(No permit)

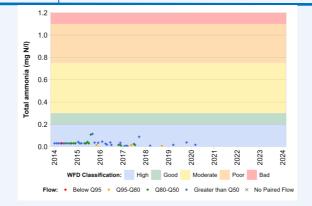
At River Ryburn At A672 Slitheroe Bridge (NE-49500672) the average pH between 2014-2023 was 7.8 with a maximum temperature of 14.6°C for the same period.

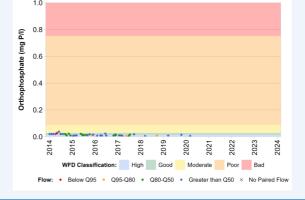
YorkshireWater

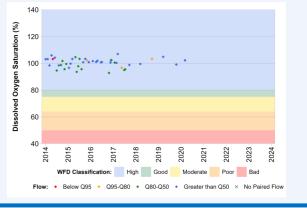


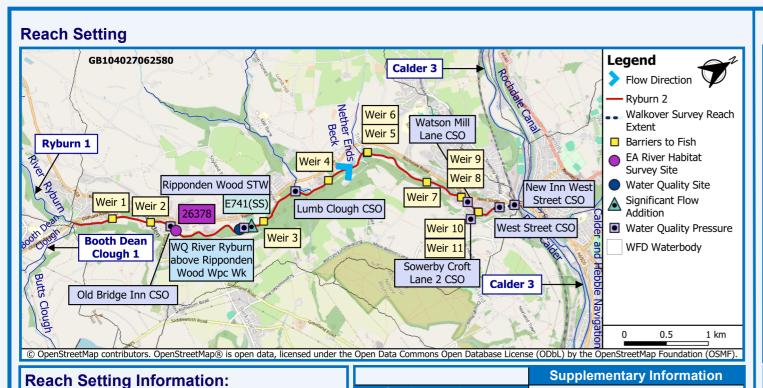
Figure A4.13

River Ryburn 1









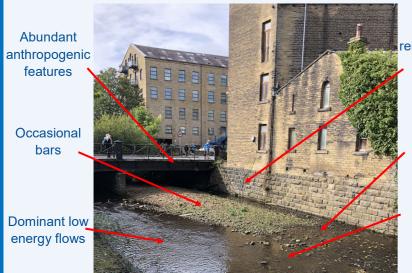
River Flow Regime
20 Q50 Q50 Q95 Q95 Qs95 Qs95 Qs99
1 Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sep 1 Oct 1 Nov 1 Dec 1 Jan 1 Feb 1 Mar 1 Apr ————————————————————————————————————
Reference Drought Plan Significant Flow Flow Rate Abstraction /

-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact	
Q <sub>s</sub> 95	18.00	6.00	67	Summer	
Q <sub>s</sub> 99	18.00	6.00	67	Major	
Q95	18.00	6.00	67	Winter	
Q50	18.00	6.00	67	Major	

Significant Flow Additions/Reductions	Flow Rate (MI/d)	Abstraction / Discharge
Ripponden Wood STW E741(SS)	1.64 (Dry Weather	Discharge
	Flow)	

### **River Habitats**

Ripponden and Sowerby.



The bedrock geology is dominated by lithologies of the

Millstone Grit Group (mudstone, sandstone and siltstone) and superficial geology is generally composed of alluvium

beneath the channel with some head deposits towards the

mid sections of the reach. Soil types along the reach are composed of freely draining, slightly acid loamy soils. This

reach has a large urban presence as it passes through

Dominant reinforced and modified banks

**Catchment Area at** 

**Assessment Point** 

**Mean Slope Gradient** 

Length of Reach

**Additional Catchment Area** 

Upstream Reach

Downstream Reach

Abundant coarse sediment

Dominant modified channel



boulders

34.2km<sup>2</sup>

0.6°

6.2km

18.4km<sup>2</sup>

Booth Dean Clough 1/River Ryburn 1

River Calder 3

Occasional marginal vegetation

Dominant modified channel

Dominant low energy flows

Abundant coarse sediment

### **River Water Quality**

Significant Water Quality Pressures	Permit Conditions
Ripponden Wood STW E741(SS)	1.64Ml/d Dry Weather Flow 7 mg/l Ammonia (N) (95th percentile) 70 mg/l BOD ATU (95th percentile)
There are 7 CSOs that could be considered intermittent water quality pressures in this reach, each with descriptive consents.	Intermittent discharges

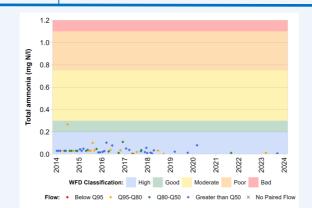
At the River Ryburn Above Ripponden Wood Wpc Wk (NE-49500668) the average pH between 2014-2025 was 7.8 with a maximum temperature of 15°C for the same period.

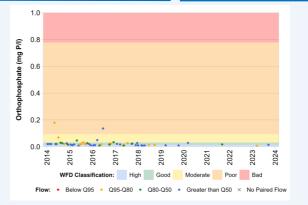


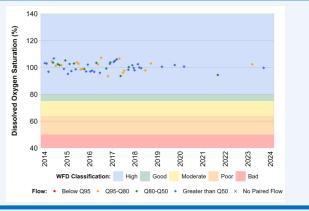


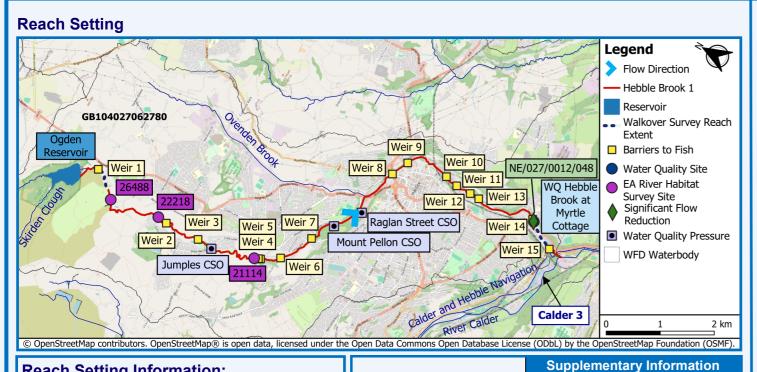
Figure A4.14

River Ryburn 2









**Catchment Area at** 

**Assessment Point** 

**Mean Slope Gradient** 

**Length of Reach** 

**Additional Catchment Area** 

Frequent

riparian

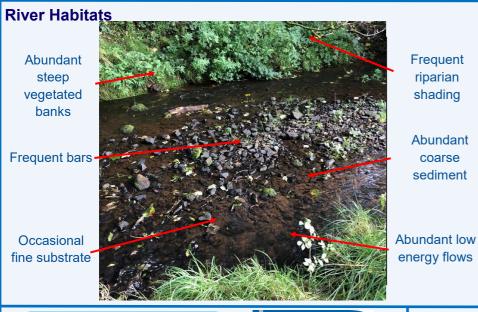
shading

coarse

energy flows

River FI	low Regime	
≥ 8 -		
	hange the second	
6 -		
=		
MI/o		
(p/IM) wold	- home man from the same of the	
Ĕ		Q50 -
2 -		Q95
2 -	in world broke your and a company of the company of	= Qs95
		=
0 -		Qs99
	Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sep 1 Oct 1 Nov 1 Dec 1 Jan 1 Feb 1 Mar 1 A	\pr
	1995/96 Baseline —— 2018/19 Baseline 1995/96 Drought Option 2018/19 Drought	Option

-	Reference Conditions (MI/d)	Drought Plan Conditions (MI/d)	% Reduction	Impact	Significant Flow Additions/Reductions	Flow Rate (MI/d)	Abstraction / Discharge
Q <sub>s</sub> 95	3.42	1.13	67	Summer			
Q <sub>s</sub> 99	3.42	1.13	67	Major	Canal and River Trust	No value	Abstraction
Q95	3.42	1.13	67	Winter Major	NE/027/0012/048	NO Value	Abstraction
Q50	3.42	1.13	67				



**Upstream Reach** N/A **Downstream Reach** River Calder 3 Occasional anthropogenic features Abundant Rare bank reinforcement sediment

3.6km<sup>2</sup>

1.1°

12.4km

30.9km<sup>2</sup>

Occasional riparian shading

**Abundant** coarse sediment

**Dominant low** energy flows

River	Water	Quality
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Significant Water Quality Pressures	Permit Conditions
Jumples CSO	Intermittent discharge
Mount Pellon CSO	Intermittent discharge
Raglan Street CSO	Intermittent discharge

At Hebble Brook At Myrtle Cottage (NE-49500374) the average pH between 2014 -2024 was 7.7 with a maximum temperature of 14.8°C for the same period.



**Reach Setting Information:** 

The bedrock geology is dominated by the Millstone Grit

Group. No significant superficial deposits are identified

beneath the reach. Soil types along the reach are com-

the mid to lower reaches as the reach passes through

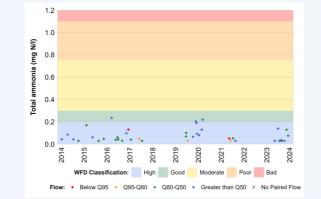
posed predominantly of freely draining, slightly acid loamy

soils with some very acid, loamy upland soils concentrated around the reservoir outflow. Urbanisation increases from



Figure A4.15 **Hebble Brook 1** 





**Abundant** 

relatively

steep banks

