



Greater Cambridge Partnership (GCP)

Cambourne to Cambridge

Environmental Statement

Technical Report 13, Appendix TR13.2 - Water
Framework Directive Screening and Scoping
Assessment





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Technical

Report 13, Appendix TR13.2 - Water Framework Directive
Screening and Scoping Assessment

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1 Introduction

1.1 Background

- 1.1.1. This Water Framework Directive Screening and Scoping Assessment has been prepared by WSP UK Ltd. (WSP) on behalf of Greater Cambridge Partnership (GCP) to support the planning permission application for the Cambourne to Cambridge (C2C) Transport and Works Act Orders (TWAo) Stage, hereafter referred to as the C2C Scheme.
- 1.1.2. The C2C Scheme is a new public transport link to connect Cambourne to Cambridge and will cross watercourses along the proposed route. The proposed design interacts with nine waterbodies throughout its length: thus, each activity associated with the C2C Scheme, such as watercourse crossings, culverts, and outfalls, has been screened and scoped against the ecological and chemical quality elements that comprise the WFD classification.
- 1.1.3. The primary aim of the Water Framework Directive (WFD) is to protect the water environment and ensure all water bodies meet their objective of Good Ecological Status (or Good Ecological Potential for heavily modified water bodies) and to prevent any deterioration in water body status. A suite of ecological and chemical quality elements is used to determine the overall status/potential of each surface water body. This assessment consists of a screening exercise of all WFD water bodies, protected areas, and construction and operational activities related to the C2C Scheme. It also summarises the scoping of potential WFD quality elements that may be affected by the C2C Scheme and recommendations for further assessment (if required).

1.2 Study Area

- 1.2.1. The area comprising the C2C Scheme and the WFD catchments within a 5km radius, hereafter referred to as the Study Area, is located to the west of Cambridge, Cambridgeshire (**Plate TR13.2-2**). The centre of the site is located at the approximate Ordnance Survey grid reference TL 36704 59873. The Study Area is located within the Anglian River Basin District.

1.3 Proposed Scheme

- 1.3.1. The proposed C2C route runs west to east from Cambourne to Cambridge (**Plate TR13.2-1**). Leaving Cambourne, the proposed C2C route passes through the proposed Bourn airfield development site before bearing north to run alongside the A428. At the junction with the A1303, the proposed route heads east to run parallel with the A1303. The proposed site for the Transport Hub is located approximately a third of the way along the proposed route at Scotland Farm. In this location, the Transport Hub would be adjacent to a small ordinary stream named Callow Brook. A discharge of run-off from the Transport Hub (via an

attenuation pond) is proposed for this watercourse. As the route reaches the end at Cambridge, it crosses Bin Brook and a new bridge is proposed in this location.

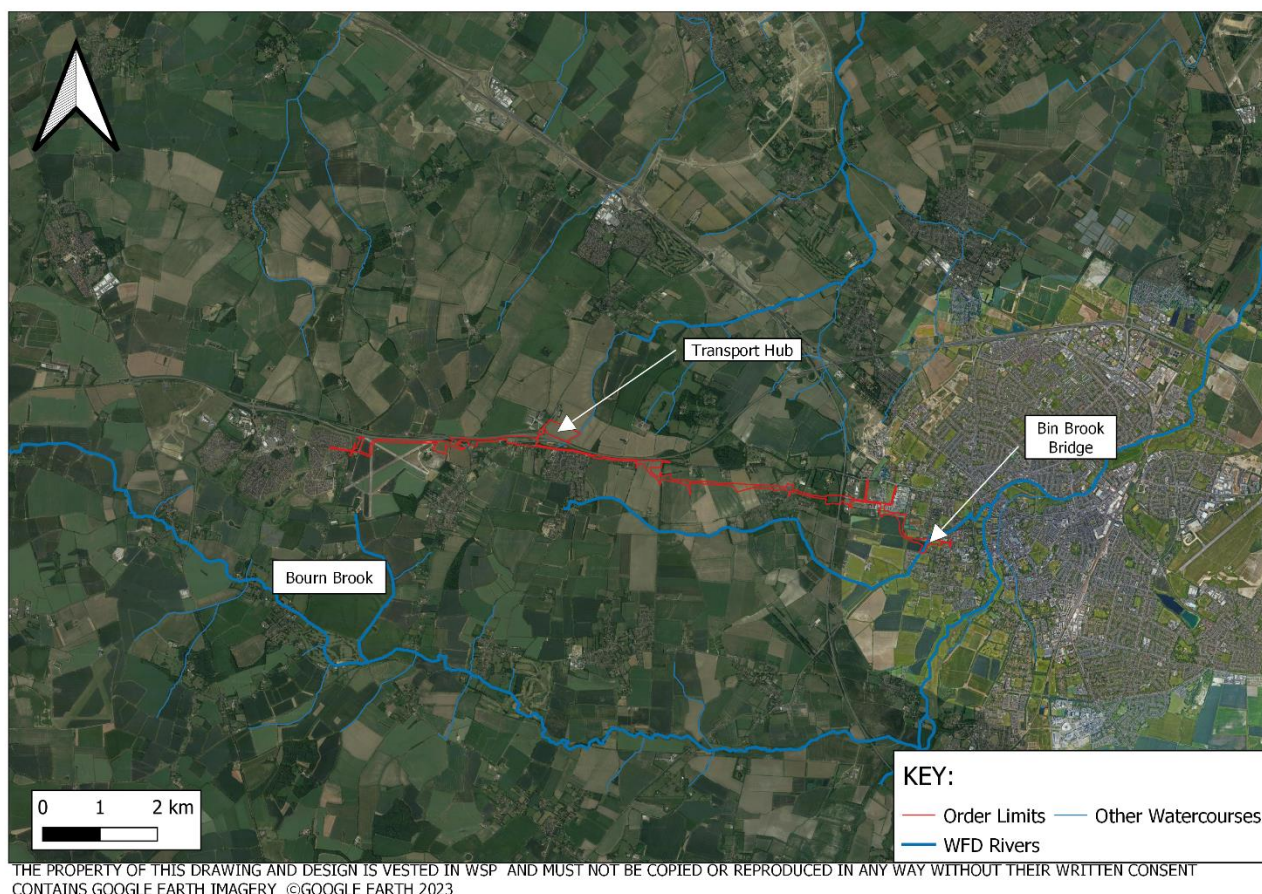


Plate TR13.2-1 – Route Overview highlighting the location of the proposed Transport Hub and Bin Brook Crossing

Operational activities

- 1.3.2. The C2C Scheme comprises the following operational activities, which may have potential impacts on the WFD water bodies and quality elements:
- 1.3.3. The new bridge abutments at Bin Brook¹ would be set back 1.5m from the bank top, with an approximate span of 16m to the opposite abutment and extending a minimum of 15.3m parallel to the bank top.

¹ Bin Brook Bridge General Arrangement Drawing (Document number (70086660-WSP-SBR-XX-DR-BR-0004))

- 1.3.4. Two outfalls are proposed to discharge runoff into Bin Brook, one on each bank. Buses running over the Bin Brook Bridge would be the main operational activity, as well as active travel from pedestrians and cyclists and occasional service vehicles.
- 1.3.5. Salt spreading and road maintenance would be required. This has the potential to impact the Bin Brook and the Callow Brook (Old West River) catchments. An attenuation pond is proposed to collect runoff from the car park at the Transport Hub before discharging into the Callow Brook via an outfall.
- 1.3.6. Three new drainage ditch crossings are proposed within the Bin Brook catchment, culverting these ditches is likely to be the chosen method of crossing.
- 1.3.7. Within the Bin Brook catchment, two outfalls are proposed to discharge surface water into ditches that are interconnected with the Bin Brook water body.

Construction activities

- 1.3.8. The C2C Scheme would comprise the following construction activities, which may have potential impacts on the WFD water bodies and quality elements:
- 1.3.9. Vegetation clearance to prepare the site and provide safe access near Bin Brook.
- 1.3.10. Temporary access for construction machinery on both banks of Bin Brook.
- 1.3.11. Bridge abutments would be constructed from reinforced concrete, 1.5m from the bank edge of Bin Brook. Concrete wing walls would be constructed to support the structure from behind the abutments, and eight reinforced concrete piles would be cast into the ground to support the abutments.
- 1.3.12. Prestressed concrete beams would be constructed offsite. Each beam would weigh approximately 7 tonnes and would be lifted onto position by a crane before being cast in-situ. The deck has been designed to be above the 1 in 100-year water level of the Bin Brook, with a 19% allowance for climate change.
- 1.3.13. The connecting road to the Bin Brook Bridge would require earthworks to raise the ground to the required height to connect to the bridge deck.
- 1.3.14. Construction of an attenuation pond at the Transport Hub and an outfall into the Callow Brook. It is assumed that temporary access for construction machinery and vegetation clearance in an agricultural field (with no obvious buffer strip) would be required.

2 Methodology

2.1 Introduction

- 2.1.1. The assessment methodology adopted by this assessment is based on guidance provided by the Planning Inspectorate Advice Note 18: The Water Framework Directive (The Planning Inspectorate, 2017). This guidance outlines a three-stage process for WFD assessment: screening, scoping, and impact assessment. This preliminary WFD assessment comprises Stage 1 – Screening and Stage 2 – Scoping only. As potential impacts are identified to water bodies within the Study Area, it is recommended for a Stage 3: Impact Assessment to be undertaken. The assessment methodology (and any necessary mitigation) would be agreed upon with the Environment Agency as the competent Authority for the implementation of the WFD through subsequent consultation.

2.2 Stage 1: Screening

- 2.2.1. Screening is required to identify activities which have the potential to result in the deterioration of a water body or failure to comply with the objectives of that water body. Screening also serves to identify those proposed activities (e.g., proposed construction methods) that are required to be taken through to scoping and those that are unlikely to result in the deterioration of the water body.
- 2.2.2. As part of the screening exercise, a desk-based study was carried out to understand the baseline conditions of the watercourses considered in this preliminary WFD assessment. The following data sources were used for the desk study:
- Contemporary Ordnance Survey maps;
 - Geology and soil map²;
 - Borehole data³;
 - Current aerial photography⁴;
 - WFD status and objectives from Catchment Data Explorer⁵;
 - Environment Agency ecology data⁶;
 - Historical maps⁷;

² BGS (2022). Available at <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/> - Accessed on 30/11/2022

³ BGS (2022). Available at <https://www.bgs.ac.uk/information-hub/borehole-records> - Accessed 30/11/2022

⁴ Google Earth (2022). Available at <https://earth.google.com> - Accessed on 30/11/2022

⁵ Environment Agency (2022). Available at <https://environment.data.gov.uk/catchment-planning> - Accessed on 30/11/2022

⁶ Environment Agency (2022). Available at <https://environment.data.gov.uk/ecology/explorer/> - Accessed on 29/11/2022.

⁷ National Library of Scotland (2022). Available at <https://maps.nls.uk/geo/explore/> - Accessed on 30/11/2022

- Map for designated areas, habitats and species, and landscape data⁸; and,
- Hydrological data⁹.

2.3 Stage 2: Scoping

- 2.3.1. Scoping is required to identify risks to receptors from a project's activities based on the relevant water bodies and their water quality elements (including information on status, objectives, and the parameters for each water body). Potential risks to hydromorphology, biology (habitats and fish), water quality, WFD-protected areas and invasive non-native species should be assessed. The scoping stage identifies which elements need to be carried forward to Stage 3.

2.4 Stage 3: Impact Assessment

- 2.4.1. Where an assessment has been considered necessary at scoping stage, an impact assessment is carried out for each receptor identified as being at risk in terms of potential deterioration or non-compliance with its specific objectives as set out in the River Basin Management Plan as a result of the project. Where the potential for deterioration of water bodies is identified, and it is not possible to mitigate the impacts to a level where deterioration can be avoided, the project would need to be assessed in the context of Article 4(7) of the WFD.
- 2.4.2. Whilst assessing potential construction impacts is not required as part of a WFD assessment, these impacts may have detrimental impacts on WFD quality elements, and construction periods may sometimes be of long duration (i.e., several years). Thus, construction impacts are considered, along with mitigation, to reduce or eliminate potential impacts on the water body and WFD quality elements.

⁸ MAGIC (2022). Available at <https://magic.defra.gov.uk/> - Accessed on 30/11/2022

⁹ UKCEH (2022). Available at <https://www.ceh.ac.uk/> - Accessed on 30/11/2022

3 WFD Screening and Scoping

3.1 Stage 1: WFD Screening

- 3.1.1. The WFD screening stage aims to identify the extent to which the C2C Scheme may affect WFD water bodies within the zone of influence of the C2C Scheme.

SCREENING OF WATER BODIES

- 3.1.2. A summary of the screening of WFD surface and ground water bodies is provided in the tables below (**Table TR13.2-1** and **Table TR13.2-2**). Two of the nine WFD waterbodies within the zone of influence of the C2C Scheme are screened for further assessment. The remaining water bodies are considered sufficiently far from the zone of influence of the C2C Scheme and, therefore, are screened out for further assessment. A map of the WFD water bodies near the C2C Scheme is provided in **Plate TR13.2-2**.

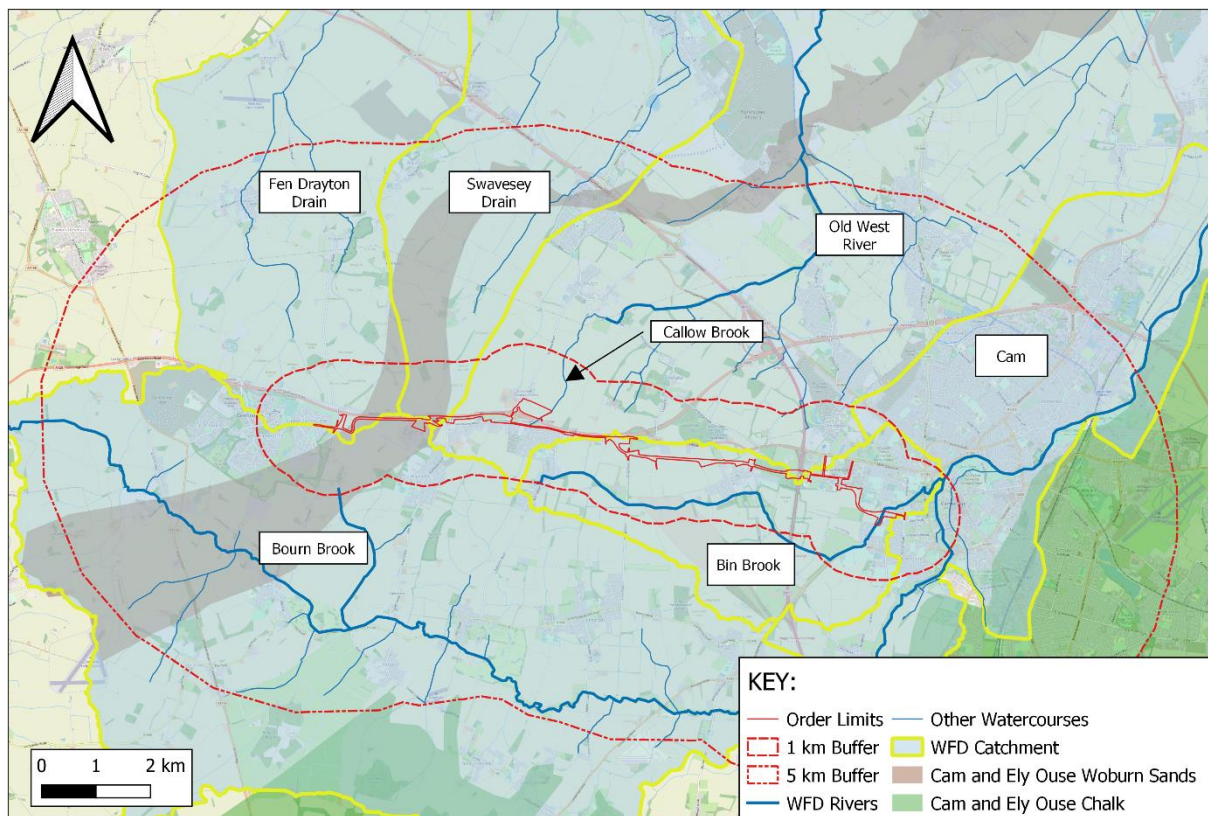


Plate TR13.2-2 – Map of WFD water bodies and catchments within 5km of C2C Scheme

Table TR13.2-1 - Screening of WFD Surface Water Bodies

WFD Water body	WFD ID	Type	Ecological Status / Potential	Screening Assessment	Justification
Bin Brook	GB105033042680	River (HMWB)	Moderate	In	This water body lies directly in the site boundary of the C2C Scheme. A new bridge is proposed over the Bin Brook, which could lead to construction and operational impacts on WFD elements of this water body. Works are also proposed in drainage ditches that are expected to have a significant degree of hydrological connectivity to the Bin Brook water body. Therefore, this water body has been screened in for further assessment.
Cam	GB105033042750	River (HMWB)	Moderate	Out	The River Cam confluence is approximately 1.6 km downstream from the proposed works at Bin Brook. Impacts are expected to be localised to the C2C Scheme and unlikely to cause any adverse impacts to WFD elements further downstream within this water body boundary. The River Cam is therefore considered sufficiently distant downstream from the C2C Scheme to be screened out of further assessment.
Bourn Brook	GB105033042690	River (HMWB)	Moderate	Out	The Bourn Brook water body has minimal overlap with the C2C Scheme. There is one proposed crossing of a ditch on the upper boundary of this catchment, however, this ditch is considered sufficiently hydrologically disconnected from the Bourn Brook water body to be screened out of further assessment.
Old West River	GB205033043375	River (HMWB)	Moderate	In	Works are planned within the corridor of the Callow Brook ordinary water course, including a footbridge and a surface water outfall. The

WFD Water body	WFD ID	Type	Ecological Status / Potential	Screening Assessment	Justification
					Callow Brook is assumed to have a significant degree of connectivity to the Old West River water body, therefore this water body has been screened in for further assessment.
Fen Drayton Drain	GB105033042740	River (HMWB)	Good	Out	The Fen Drayton Drain water body has minimal overlap with the C2C Scheme. Surface water discharge from the western extent of the route is proposed into a ditch in this catchment. However, the ditch is considered to have negligible hydrological connectivity to the rest of the water body, therefore, this water body has been screened out of further assessment.
Swavesey Drain	GB105033042770	River (HMWB)	Moderate	Out	The Swavesey Drain water body has minimal overlap with the C2C Scheme. There is one proposed crossing of a ditch on the upper boundary of this catchment, however, this ditch seems to exist mainly for road drainage from the A428 and is considered sufficiently hydrologically disconnected from the rest of the water body to be screened out of further assessment.
Ely Ouse (South Level)	GB205033000070	River (Artificial)	Moderate	Out	The Ely Ouse (South Level) water body is immediately downstream of the Old West River water body which is screened in for further assessment. The C2C Scheme is 27 km upstream from the Ely Ouse (South Level) water body. It is considered that this water body is sufficiently distant from the C2C Scheme given the relative scale of the potential impact and opportunity for dilution. Therefore, this water body has

WFD Water body	WFD ID	Type	Ecological Status / Potential	Screening Assessment	Justification
					been screened out for further assessment.

Table TR13.2-2 - Screening of WFD Groundwater bodies

WFD Water body	WFD ID	Type	Overall Status / Potential	Screening Assessment	Justification
Cam and Ely Ouse Woburn Sands	GB40501G445700	Groundwater Body	Good	Out	The C2C Scheme crosses this groundwater body at the western extent of the route. However, BGS borehole data indicate that superficial deposits are greater than 18 m thick with no signs of groundwater above this depth. Therefore, this water body has been scoped out of further assessment as the C2C Scheme is not anticipated to interact with the groundwater body during either construction or operation.
Cam and Ely Ouse Chalk	GB40501G400500	Groundwater Body	Poor	Out	There are no proposed works directly within this groundwater body and no pathways for impact have been identified. Therefore, this water body is screened out of further assessment.

SCREENING OF ACTIVITIES

3.1.4. The C2C Scheme comprises the activities summarised below. The screening assessment of activities is presented in **Table TR13.2-2** and **Table TR13.2-3** for the WFD water bodies that were screened in for further assessment (Bin Brook and Old West River).

Construction activities:

3.1.6. Bin Brook:

- Vegetation clearance
- Construct temporary access tracks

- Abutment construction and wing walls
- Place beams and deck
- Backfill to the proposed ground level.

3.1.7. Old West River:

- Vegetation clearance
- Construction of attenuation pond and outfall
- General construction activities and heavy machinery.

Permanent structures and operational activities:

3.1.8. Bin Brook:

- Concrete bridge abutments and wing walls
- Discharge of surface water into Bin Brook and connected drainage ditches
- Traffic
- Post-construction landscape and Biodiversity Net Gain enhancements
- Salt spreading and road maintenance
- Culverted drainage ditches.

3.1.9. Old West River via Callow Brook:

- Attenuation pond discharging stormwater to the Callow Brook
- Maintenance, including salt spreading
- Footbridge over the Callow Brook, for Transport Hub access
- Extension of an existing culvert under the A428

Table TR13.2-2 - WFD screening of activities for Bin Brook Catchment

Activity	Description	Screening Outcome	Justification
Construction			
Vegetation clearance	Vegetation clearance is needed to prepare the site and provide safe access.	In	Removal of riparian vegetation has the potential to adversely impact on WFD quality elements.
Construct temporary access tracks	Temporary access for construction machinery on both sides of the bank	In	The construction of temporary access tracks and heavy machinery access could potentially impact on local

Activity	Description	Screening Outcome	Justification
			hydromorphology receptors during the construction phase.
Abutment construction and wingwalls	Bridge abutments will be constructed from reinforced concrete, 1.5 m from the bank edge. Concrete wingwalls will help support the structure from behind the abutments. Eight reinforced concrete piles will be cast into the ground to support the abutments.	In	The construction of the bridge abutments and wing walls has the potential to disrupt the riparian zone and geomorphological processes during the construction phase.
Place beams and deck	Prestressed concrete beams will be constructed offsite. Each beam should weigh around 7 tonnes and would be lifted onto position by a crane before being cast in-situ. The deck is planned to be above the 1 in 100-year water level of the brook, with a 19% allowance for climate change.	Out	The placing of the beams during the construction phase is not anticipated to have an adverse impact on any WFD quality elements. Therefore, this element is screened out of further assessment.
Backfill to the proposed ground level	The connecting road will require earthworks to raise the ground to the required height to connect to the bridge deck.	In	Earthworks close to the river during the construction phase have the potential to impact on WFD quality elements through the input of fine sediments and pollutants.
Operational			
Concrete bridge abutments and wingwalls	The new bridge abutments will be set back 1.5 m from the bank top, with an approximate span of 16 m to the opposite abutment and extending a minimum of 15.3 m parallel to the bank top. The bridge would be a single-span bridge with no direct modifications to the river channel.	In	The concrete abutments and wingwalls will be located within the active floodplain of the river. Hence, these features could potentially impact on WFD quality elements during out of bank flood flows.
Discharge of surface water	Discharge of surface water from the route around the bridge to the Bin Brook. There are also two proposed outfalls along the route, discharging into drainage ditches that are connected to the Bin Brook water body.	In	Increased runoff and drainage into the water body has the potential to lead to an impact on WFD ecological quality elements. The ditches have the potential to convey pollutants to the main water body.

Activity	Description	Screening Outcome	Justification
Traffic	Vehicular traffic over the bridge will be the main operational activity of the new bridge asset. The bridge will also open to active travel from pedestrians and cyclists.	In	Frequent traffic running over the bridge has the potential to impact upon WFD ecological quality elements during the operational lifetime of the project. Traffic may cause disturbance due to noise and vibration.
Post-construction landscape and BNG enhancements	Post-construction landscaping plans involve the planting of rich grassland and shrubs, including pollinating plants, as well as hedgerows. There is also potential for aquatic vegetation and the creation of a wetland as an enhancement feature on the Bin Brook, just south of the proposed bridge.	In	Local watercourse / wetland enhancements and riparian zone improvements may have a beneficial impact on WFD quality elements.
Salt spreading and road maintenance	As part of road maintenance, salt spreading may be required during the operational phase.	In	Salt spreading has the potential to impact on water quality and other WFD ecological quality elements.
Culverted drainage ditches	Within the Bin Brook catchment there are three new drainage ditch crossings. Culverting these has been proposed as the preferred method. These ditches are interconnected with Bin Brook water body.	In	Culverts have the potential to alter flows and impact WFD ecological quality elements within the water body.

Table TR13.2-3 - WFD screening of activities for Callow Brook and the Old West River Catchment

Activity	Description	Screening Outcome	Justification
Construction			
Vegetation clearance	Vegetation clearance is needed to prepare the site and provide safe access.	In	Removal of riparian vegetation has the potential to impact on WFD quality elements.

Activity	Description	Screening Outcome	Justification
Attenuation pond and outfall	The C2C Scheme plans to construct an attenuation pond adjacent to Callow Brook; this intends to collect runoff from the car park before discharging into the brook during the operational phase.	In	Cuttings and earthworks required to construct the attenuation pond and its outfall have the potential to release pollutants to Callow Brook during the construction phase.
Operational			
Attenuation pond discharge	The C2C Scheme plans to construct an attenuation pond adjacent to Callow Brook, which is intended to collect runoff from the car park before discharging into the brook during the operational phase.	In	The attenuation pond discharge of site runoff to the Callow Brook may aid the transport of pollutants into this water body, potentially impacting on the chemical and physico-chemical water quality elements.
Salt spreading and road maintenance	As part of the maintenance of the road and Transport Hub, salt spreading may be required during the operational phase.	In	Salt spreading has the potential to impact on water quality and other WFD ecological quality elements.
Footbridge	A footbridge is proposed to provide access to the Transport Hub from the public right of way and the existing footbridge over the A428 from Hardwick.	In	The footbridge has the potential to alter flows, water quality and habitat availability.
Culvert extension	An extension to the existing culvert under the A428 has been proposed.	Out	The existing culvert is due to the presence of an overland flow path and there is no evidence of the presence of an ordinary watercourse or a ditch. The culvert extension is expected to be insignificant and there is limited hydrological connectivity of the culvert to any water body. The culvert is on the upper edges of the catchment and is expected to be dry for most of the year, allowing some surface runoff to flow under the A428 in times of high rainfall.

3.1.10. Those activities screened in for further assessment in **Table TR13.2-2** and **Table TR13.2-3** above are carried forward to Stage 2: Scoping. Those activities screened out of further assessment are not considered further in this assessment.

3.2 STAGE 2: WFD Scoping

3.2.1. The WFD scoping stage defines the requirement for further WFD assessment. This includes identifying risks to the WFD receptors from the C2C Scheme's activities. The scoping stage assessment is presented in **Table TR13.2-4** for the Bin Brook (GB105033042680) surface water WFD water body and **Table TR13.2-5** for the Old West River (GB205033043375) surface water WFD water body.

Table TR13.2-4 - WFD scoping of the C2C Scheme's activities against WFD quality elements for the Bin Brook (GB105033042680) water body

WFD Quality Element	Risk to Receptor (Yes/No)	Scoping Outcome Reasoning
Biological Quality Elements		
Fish	Yes	The C2C Scheme has the potential to affect fish through noise disturbance, run-off, and pollution incidents during the construction phase. The C2C Scheme also has the potential to affect fish during operation. Runoff and drainage from the bridge may impact upon the water quality of the watercourse and therefore the fish community. Therefore, this element has been scoped in for further assessment.
Invertebrates	Yes	The C2C Scheme has the potential to affect aquatic macroinvertebrates through runoff, pollution incidents and drainage from the bridge that may impact upon the water quality of the watercourse and, therefore, the aquatic macroinvertebrate community. The C2C Scheme has the potential to impact aquatic macroinvertebrates species present through potential disruption of the sediment dynamics of the river. Therefore, this element has been scoped in for further assessment.
Macrophytes and phytobenthos combined	Yes	The C2C Scheme has the potential to affect macrophytes and phytobenthos through runoff, the release of fine sediment, pollution incidents, shading and drainage from the bridge that may impact upon the water quality of the watercourse and, therefore, the macrophyte and phytobenthos community. Thus, this element has been scoped in for further assessment.
Physico-chemical Quality Elements		

WFD Quality Element	Risk to Receptor (Yes/No)	Scoping Outcome Reasoning
Thermal Conditions	Yes	The C2C Scheme has the potential to impact this quality element. Removing riparian vegetation during construction could allow more sunlight to reach the channel and influence the thermal conditions. During the operational phase, the bridge may provide increased shading which may also impact on this element. Therefore, this element has been scoped in for further assessment.
Oxygenation Conditions	Yes	The C2C Scheme may contain several activities that could enhance or deteriorate oxygenation conditions (e.g., salt spray, pollutants, and chemical composition of water); therefore, this element has been scoped in for further assessment.
Salinity	Yes	The C2C Scheme may contain several activities that could alter existing salinity levels (e.g., salt spray, pollutants, and chemical composition of water); therefore, this element has been scoped in for further assessment.
Acidification Status	Yes	The C2C Scheme has the potential to introduce pollutants to the WFD water body, impacting this quality element. Therefore, this element has been scoped in for further assessment.
Nutrient Conditions	Yes	The landscaping designs for the C2C Scheme (including wetland features) have the potential to influence nutrient levels in the Bin Brook. Therefore, this element has been scoped in for further assessment.
Hydromorphological Quality Elements		
Quantity and Dynamics of Water Flow	Yes	The C2C Scheme has the potential to interact with the flow dynamics of the river by encroaching on the riparian zone close to the bank. During out-of-bank flows, this constriction may alter flow velocities. Therefore, this element has been scoped in for further assessment.
Connection to Groundwater Bodies	No	The proposed bridge does not increase connection to any surrounding groundwater bodies; therefore, it has been scoped out for further assessment.
River Continuity	Yes	The C2C Scheme has the potential to influence river continuity. The constriction created by the bridge abutments and the earthworks may change the velocities under the bridge during out-of-bank flows; therefore, this element has been scoped in for further assessment.
River Depth and Width Variation	Yes	A change in flow dynamics may result in geomorphological changes and impacts to this element (in events equal to or exceeding a 1 in 100-year return) due to the interaction with the bridge abutments. A change in flow dynamics resulting from a new outfall also has the potential to alter

WFD Quality Element	Risk to Receptor (Yes/No)	Scoping Outcome Reasoning
		the channel geometry; therefore, this element has been scoped in for further assessment.
Structure and Substrate of the River Bed	Yes	A change in the flow dynamics could potentially influence this element. Therefore, this element has been scoped in for further assessment.
Structure of the Riparian Zone	Yes	The C2C Scheme could potentially impact this quality element through vegetation removal and shading; therefore, it has been scoped in for further assessment.

Table TR13.2-5 - WFD scoping of the C2C Scheme's activities against WFD quality elements for the Callow Brook and the Old West River (GB205033043375) water body

WFD Quality Element	Risk to Receptor (Yes/No)	Scoping Outcome Reasoning
Biological Quality Elements		
Fish	Yes	The C2C Scheme has the potential to impact upon this quality element due to discharge from the attenuation pond into Callow Brook. This may impact the water quality and, therefore, the fish community.
Invertebrates	Yes	The C2C Scheme has the potential to impact upon this quality element due to discharge from the attenuation pond into Callow Brook. This may impact the water quality and, therefore, the invertebrate community.
Macrophytes and phytobenthos combined.	Yes	The C2C Scheme has the potential to impact upon this quality element due to shading and drainage caused by the bridge construction, which may impact upon the water quality of the watercourse and, therefore, the macrophyte and phytobenthos community.
Physico-chemical Quality Elements		
Thermal Conditions	Yes	The storage of water in an attenuation pond has the potential to be warmed by the sun's radiation, introducing warmer water to the Callow Brook at the point of discharge; therefore, this element has been scoped in for further assessment.

WFD Quality Element	Risk to Receptor (Yes/No)	Scoping Outcome Reasoning
Oxygenation Conditions	Yes	The C2C Scheme has the potential to alter nutrient conditions and temperature, which can impact oxygenation conditions; therefore, this element has been scoped in for further assessment.
Salinity	Yes	The C2C Scheme may contain several activities that could alter existing salinity levels (e.g., salt spray, pollutants, and chemical composition of water).
Acidification Status	Yes	The Callow Brook has the potential to introduce pollutants into the water body, potentially impacting on this quality element; therefore, it has been scoped in for further assessment.
Nutrient Conditions	Yes	The C2C Scheme could result in a change of use to agricultural land, potentially reducing the input of nutrients to the Callow Brook; therefore, this quality element has been scoped in for further assessment.
Hydromorphological Quality Elements		
Quantity and Dynamics of Water Flow	Yes	The C2C Scheme is creating additional impermeable surface and planning to discharge surface water to the Callow Brook via an attenuation pond.
Connection to Groundwater Bodies	No	The C2C Scheme does not propose to change the connection to any surrounding groundwater bodies; therefore, it has been scoped out for further assessment.
River Continuity	Yes	Introduction of any erosion protection and modification to the Callow Brook channel from the attenuation pond outfall may impact the continuity of the Callow Brook, especially during low flows where any modifications may become an obstacle to flow downstream. Therefore, this element has been scoped in for further assessment.
River Depth and Width Variation	Yes	A change in flow dynamics resulting from a new outfall has the potential to alter the channel geometry. Therefore, this element has been scoped in for further assessment.
Structure and Substrate of the River Bed	Yes	A change in flow dynamics resulting from a new outfall has the potential to alter the river bed substrate and morphology; therefore, this element has been scoped in for further assessment.
Structure of the Riparian Zone	Yes	The C2C Scheme has a new permanent attenuation pond outfall on the floodplain. The permanent modification has the potential to impact

WFD Quality Element	Risk to Receptor (Yes/No)	Scoping Outcome Reasoning
		the structure of the riparian zone. Therefore, this element has been scoped in for further assessment.

3.3 Heavily Modified Water Body Mitigation Measures

- 3.3.1. The Bin Brook surface water body (GB105033042680) and the Old West River surface water body (GB205033043375) are designated as Heavily Modified Water Bodies (HMWB). HMWB are bodies of water which, because of physical alterations by human activity, are substantially changed in character and cannot meet "good ecological status". However, HMWBs have the objective to achieve "good ecological potential" through the delivery of HMWB mitigation measures. Therefore, the C2C Scheme must not prevent the implementation of any HMWB mitigation measures.
- 3.3.2. It was agreed with the Environment Agency in the consultation on 17 January 2023 that HMWB mitigation measures will be assessed against the detailed design as part of the detailed assessment, which will form part of the FRAP submission.
- 3.3.3. However, an assessment based on the current design / information and professional judgment is provided in **Table TR13.2-7**. According to this assessment, the HMWB mitigation measures are not expected to be impacted by the Proposed Scheme and, therefore, are not anticipated to be prevented from achieving "good ecological status" through those measures.

Table TR13.2-6 - Assessment of the mitigation measures and their potential applicability restriction due to the Proposed Scheme.

Mitigation measure	Does the Proposed Scheme prevent its implementation?	Justification
Bin Brook surface water body (GB105033042680)		
In-channel morphological diversity	No	The construction activities that could impact the in-channel morphology (e.g., silt-laden flows, suspended sediment supply) are not anticipated to occur if standard mitigation measures are applied. During the operational phase, no in-channel morphological modifications are proposed and, in conjunction with appropriate drainage strategies, are not expected to alter the existing in-channel morphological diversity. Therefore, the Proposed Scheme does not prevent the implementation of in-

Mitigation measure	Does the Proposed Scheme prevent its implementation?	Justification
		channel morphological diversity enhancements and the achievement of a “good ecological potential”.
Reduce sediment inputs	No	The construction activities that could impact the existing sediment regime (e.g., silt-laden flows, suspended sediment supply) are not anticipated to occur if standard mitigation measures are applied. During the operational phase, the associated drainage strategy should sufficiently retain overland flow sediments that could impact the existing in-channel morphology, making it a negligible impact with no long-term consequences. In addition, none of the proposed activities prevents the implementation of measures to reduce sediment supply. Therefore, the Proposed Scheme does not prevent the achievement of a “good ecological potential”.
Improve fish passage	No	The construction activities that could impact the existing in-channel morphology and, by extension, the existing fish passage (e.g., silt-laden flows, suspended sediment supply) are not anticipated to occur if standard mitigation measures are applied. During the operational phase, the associated drainage strategy should sufficiently retain overland flow sediments that could impact the existing in-channel morphology, making it a negligible impact with no long-term consequences. In addition, no in-channel modifications are proposed and, therefore, impacts to the fish passage are not expected. Therefore, the Proposed Scheme does not prevent the implementation of improvements to fish passage and the achievement of a “good ecological potential”.
Appropriate techniques to prevent the transfer of invasive species	No	As part of the construction activities, standard procedures must be adopted to prevent the spread of invasive species. In addition, the operational phase of the Proposed Scheme does not prevent the implementation of any technique to control the transfer of invasive species. Therefore, the Proposed Scheme does not prevent the implementation of this HMWB mitigation measure and the achievement of a “good ecological potential”.
Create a wetland/flood storage area	No	The footprint of the Proposed Scheme is negligible to the scale of the waterbody (e.g., the bridge is 16m long, and the Bin Brook is 9.7km long). In addition, the proposed bridge does not prevent the construction of a wetland/flood storage area in its surroundings. Therefore, the Proposed Scheme does not prevent the

Mitigation measure	Does the Proposed Scheme prevent its implementation?	Justification
		implementation of this HMWB mitigation measure and the achievement of a “good ecological potential”.
Old West River surface water body (GB205033043375)		
In-channel morphological diversity; Channel maintenance strategies	No	The construction activities that could impact the in-channel morphology and channel maintenance strategies (e.g., silt-laden flows, suspended sediment supply) are not anticipated to occur if standard mitigation measures are applied. During the operational phase, no in-channel morphological modifications are proposed and, hence, no impact on the channel maintenance strategies is expected. Therefore, the Proposed Scheme does not prevent the implementation of these HMWB mitigation measures and the achievement of a “good ecological potential”.
Sediment management strategies	No	The construction activities that could impact the sediment maintenance strategies (e.g., silt-laden flows, suspended sediment supply) are not anticipated to occur if standard mitigation measures are applied. During the operational phase, the proposed attenuation pond and associated drainage strategy should retain overland flow sediments that could impact the existing in-channel morphology, making it a negligible impact with no long-term consequences. In addition, none of the proposed activities prevents the implementation of measures to reduce sediment supply. Therefore, the Proposed Scheme does not prevent the implementation of any sediment management strategy and the achievement of a “good ecological potential”.
Removal of hard bank; Preserve and restore habitats, banks and riparian zone	No	No in-channel modifications are proposed as part of the operational phase (including any hard bank protection or changes to the ability to preserve/restore habitats, banks and riparian zone). Therefore, the Proposed Scheme does not prevent the implementation of these HMWB mitigation measures and the achievement of a “good ecological potential”.

4 Consultation and next steps

- 4.1.1. This WFD screening and scoping assessment considered the potential impacts of the C2C Scheme on nine water bodies. The assessment has concluded that two surface water bodies have the potential to be affected by the C2C Scheme; the Bin Brook surface water body (GB105033042680) and the Old West River surface water body (GB205033043375). Among the WFD quality elements, it is considered that there are potential risks to both Ecological and Chemical Quality Elements. However, the potential for impacts is dependent upon detailed design and construction methods. Considering this, it has been agreed with the Environment Agency that it is highly likely that these risks can be designed out or suitably mitigated during the detailed design phase. Therefore, further assessment and mitigation will be provided as part of a Stage 3: Impact Assessment to demonstrate WFD Compliance as part of the Flood Risk Activity Permit (FRAP) application. The Bin Brook surface water body (GB105033042680) and the Old West River surface water body (GB205033043375) are Heavily Modified Water Bodies (HMWB). Information provided by the Environment Agency was used to assess if the Proposed Scheme had the potential to prevent the implementation of any HMWB mitigation measures and attainment of Good Ecological Potential. The results of this assessment indicate that the Proposed Scheme does not prevent the implementation of any HMWB mitigation measures and achievement of Good Ecological Potential. This will also be reviewed as part of the Stage 3 assessment during detailed design.
- 4.1.2. The Greater Cambridgeshire Partnership (GCP) is seeking to achieve a Biodiversity Net Gain (BNG), as part of the Proposed Scheme. The delivery of a biodiversity net gain has the potential to positively contribute to WFD water body objectives shown in **Table TR13.2-7**.

5 References

The Planning Inspectorate. (2017, June). *Advice Note Eighteen: The Water Framework Directive*. Retrieved from <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-18/>



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