SUNNICA ENERGY FARM

EN010106

Volume 6

Environmental Statement

6.2 Appendix 9B: Water Framework Directive Assessment

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

18 November 2021

Version number: 00

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Sunnica Energy Farm

Environmental Statement
Appendix 9B: Water Framework Directive Assessment

Regulation Reference:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	EN010106
Application Document Reference	EN010106/APP/6.2
Author	Sunnica Energy Farm Project Team

Version	Date	Status of Version
Rev 00	18 November 2021	Application Version

Executive summary

A Water Framework Directive (WFD) assessment has been prepared as part of the application for a Development Consent Order (DCO) for the Sunnica Energy Farm, herein referred to as 'the Scheme'. The Scheme interacts with a number of water bodies throughout the Order limits, thus an assessment of each activity and component of the Scheme is required against the relevant quality elements of the WFD to determine compliance. This includes construction, operation, and decommissioning of solar PV panels, supporting infrastructure, and cable crossings of water bodies.

The WFD aims to protect and enhance the quality of the water environment. It takes a holistic approach to the sustainable management of water by considering the interactions between surface water, groundwater and water-dependent ecosystems. Ecosystem quality is evaluated according to interactions between biological, physico-chemical and hydromorphological elements (or 'Quality Elements').

The WFD is transposed in England by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Following the departure of the United Kingdom from the European Union these regulations continue to apply until they are revoked or superseded by new legislation.

In accordance with Advice Note 18 published by the Planning Inspectorate, this assessment takes a stepwise approach consisting of three phases: screening, scoping and detailed impact assessment. The screening stage of the assessment identifies a zone of influence of the Scheme and identifies water bodies that may be impacted by the activities associated with the Scheme. It also considers what activities and constituent parts of the Scheme may be a risk to the WFD water body receptors. The scoping stage of the assessment considers which WFD quality elements may be at risk from the Scheme's activities and constituent parts. WFD quality elements that are considered to be at risk are taken forward to the detailed impact assessment stage, which determines whether the Scheme complies with WFD objectives.

The detailed impact assessment stage considers the potential impacts to quality elements that may result from the Scheme's activities, and thus whether deterioration of the water body may occur. It also considers whether the Scheme may compromise the ability of a water body to achieve Good Ecological Status or Potential, when not currently at that status and there are no lower targets set by the Environment Agency. This assessment takes into account the objectives of Protected Areas, and whether it will compromise the achievement of WFD objectives by other water bodies in the same River Basin District. Finally, the impact assessment stage also considers whether the Scheme will contribute to the delivery of WFD objectives, by addressing existing risks and pressures or providing enhancement to water bodies. As part of the assessment, any proposed mitigation that is embedded in the design or to be applied as a standalone measure, is taken into account.

This assessment studies seven surface WFD designated water bodies: Kennett – Lee Brook (Lee Brook); Lark Downstream of Mill Street Bridge; Kennett-Lee Brook (River Kennett); Lee Brook; Soham Lode; New River; and Burwell Lode. Each of the water bodies are classified as Heavily Modified under the WFD and have been subject to a range of pressures including historic straightening and channelisation, embanking, poor nutrient management in terms of agricultural runoff, and point source sewage discharge. The water bodies vary in character from artificial channels constructed for land drainage purposes to chalk streams, and their current condition present numerous options for enhancement

opportunities. In addition, the assessment has also considered potential impacts with the Cam and Ely Ouse Chalk WFD groundwater body.

Four components of the Scheme were screened into this assessment: intrusive crossings of water bodies by the cable corridor; non-intrusive crossings of water bodies, the railway and A11 road by the cable corridor, piling for the foundation of the BESS and substations; and new watercourse crossings required for access roads.

Intrusive crossing techniques are only considered suitable on the smaller, less significant watercourses, none of which are directly designated under the WFD (i.e. only by catchment association to a designated watercourse). Impacts from intrusive crossings largely arise from direct disturbance of the riparian zone and channel, and indirect impacts during the construction period from the potential risk of fine sediment and chemical pollutants draining into watercourses if not adequately controlled. Mitigation will be delivered through good industry practice as outlined in the Construction Environmental Management Plan (CEMP) (refer to the Framework CEMP in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2])** and Water Management Plan (WMP). In addition, pre-works surveys will inform suitable reinstatement of the channel, which will include additional lengths of enhancements.

The non-intrusive method of watercourse crossing is proposed for the larger, more significant watercourses within the study area. This method will avoid direct impacts to the channel and riparian zone. Indirect impacts may arise from uncontrolled release of construction site runoff or potentially through ‘break-out’ of drilling fluids (water based) under the channel. However, these risks will be mitigated through the implementation of the CEMP and WMP, and the works will be undertaken by a specialist contractor who will continuously monitor drilling operations.

Watercourse crossings, dependent on their design, can cause loss of riparian, bed and bank habitats, and indirect loss due to shading, and can present a barrier to connectivity of the watercourse with the floodplain and longitudinally. The proposed crossings are located on minor tributaries, and given their very small footprint in relation to the length of the WFD water body they fall under, will not present a significant impact. Their impact would be mitigated through the design of an open span crossing or inclusion of a buried culvert base and natural bed; maintaining a continuous gradient with the current watercourse; and sizing the crossings so that they will not impact flow velocities or back up flood flows.

This assessment concludes that the Scheme would not impact on the WFD status or objectives of any associated surface water or groundwater bodies within the Scheme’s zone of influence, subject to the proposed mitigation measures being applied. The Scheme is also committed to providing enhancement of WFD watercourses within the Order limits to support future attainment of WFD objectives, subject to details being set out in a WFD Mitigation and Enhancement Strategy, which will be secured through the Framework CEMP in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2]**.

Table of contents

Table of Tables

1 Introduction

1.1 Scheme Description

1.1.1 This Water Framework Directive assessment (WFDa) has been prepared as part of the Development Consent Order (DCO) application for Sunnica Energy Farm, hereafter referred to as the Scheme. The Scheme interacts with seven WFD surface water bodies and one WFD groundwater body and thus it is necessary to consider the activities and constituent parts of the Scheme to determine compliance with WFD objectives. This includes assessing the impact of new solar photovoltaic (PV) panels, supporting infrastructure, and cable crossings of water bodies, on the biological, physico-chemical and hydromorphological quality elements that comprise the WFD to ensure no deterioration and no prevention of future improvement in water body status.

1.1.2 The Scheme comprises the construction, operation (including maintenance), and decommissioning of ground mounted solar PV arrays, a Battery Energy Storage System (BESS) and supporting infrastructure.

1.1.3 The Scheme is defined as a Nationally Significant Infrastructure Project (NSIP) as it is an onshore generating station in England exceeding 50 megawatts (MW). Components of the Scheme are:

a. Solar PV panels;
b. PV module mounting structures;
c. Inverters;
d. Transformers;
e. Switchgear;
f. Cabling (including high and low voltage cabling);
g. One or more Battery Energy Storage System (BESS) (expected to be formed of lithium ion batteries storing electrical energy) on Sunnica East Site A, Sunnica East Site B and Sunnica West Site A;
h. An onsite substation comprising a substation and control building (Sunnica East Site A, Sunnica East Site B and Sunnica West Site A only);
i. Burwell National Grid Substation Extension
j. Office/warehouse buildings (Sunnica East Site A and Sunnica East Site B only);
k. Fencing and security measures;
l. Drainage;
m. Internal access roads and car parking;
n. Landscaping including habitat creation areas; and
o. Construction laydown areas.

1.1.4 Three substations will be located alongside the BESS at the Sunnica East Site A, Sunnica East Site B and Sunnica West Site A. These will consist of electrical infrastructure such as the transformers, switchgear and metering equipment required to facilitate the export of electricity from each respective site to the Burwell National Grid Substation Extension.

1.1.5 The Burwell National Grid Substation Extension is approximately 5.5km to the west of the Sunnica West Site B. A 132kV cable will be installed to connect the Sunnica East Site A, Sunnica East Site B, Sunnica West Site A, and Sunnica West Site B to the Burwell National Grid Substation Extension. The total length of the cable run for Grid Connection Route A will be approximately 7km, and 13km for Grid Connection Route B.

1.1.6 Further details of the Scheme can be found within **Chapter 3: Scheme Description** of the Environmental Statement **[EN010106/APP/6.1.3]**.

1.2 Study Area

1.2.1 The Scheme is located north of the town of Newmarket and extends across part of Suffolk and Cambridgeshire. For the purposes of this assessment, and consistent with the Water Environment Impact Assessment presented in **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1.9]** a general study area of approximately 1 km around the Order limits has been considered in order to identify water bodies that are hydrologically connected to the Order limits and potential works associated with the Scheme that could cause direct impacts.

1.2.2 Given that watercourses flow and water quality and flood risk impacts may propagate downstream, where relevant the assessment also considers a wider study area to as far downstream as a potential impact may influence the quality or quantity of the water body (which in this case is typically for a few kilometres). Professional judgement has been applied to identify the extent to which such features are considered.

1.2.3 Sunnica East Site A is within the Kennett - Lee Brook (Lee Brook) catchment which drains into the River Lark and into the River Great Ouse downstream of Ely. Sunnica East Site B is mainly located within Lark downstream of Mill Street Bridge WFD water body catchment, with a small section of the southern area within the Kennett-Lee Brook (River Kennett) water body catchment. The majority of the Sunnica West Site A is within the Lee Brook catchment, situated on the north-western boundary of the main portion of the Site. The Sunnica West Site B is within the Soham Lode WFD water body (River Snail) catchment, which drains to the Soham Lode and then into the River Great Ouse upstream of Ely. The remaining WFD water bodies within the study area, namely those crossed by Grid Connection Route A and Grid Connection Route B, and at the location of the Burwell National Grid Substation Extension are identified in Stage 1: WFD Screening, Section 3.1.

1.2.4 A plan of the Order limits with surface water bodies and their attributes is shown in Figure 1 in Annex 1. Figures 2 and 3 in Annex 1 show the groundwater body

and features throughout the Order limits, and chalk groundwater contours respectively.

1.3 Introduction to the Water Framework Directive

1.3.1 The WFD, EC Directive 2000/60/EC, (Ref. 1) aims to protect and enhance the quality of the water environment across all European Union (EU) member states. England and Wales have adopted the WFD as national law by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref. 2). Following the departure of the United Kingdom from the European Union these regulations continue to apply until they are revoked or superseded by new legislation.

1.3.2 The WFD takes a holistic approach to the sustainable management of water by considering the interactions between surface water, groundwater and water-dependent ecosystems. Ecosystem quality is evaluated according to interactions between biological, physico-chemical, and hydromorphological elements (or 'Quality Elements').

1.3.3 Under the WFD, 'Water bodies' are the basic management units and are defined as all or part of a river system or aquifer. Water bodies form part of larger River Basin Districts (RBD), for which River Basin Management Plans (RBMPs) are developed and environmental objectives are set. RBMPs are produced every six years, in accordance with the river basin management planning cycle. Cycle 2 plans were published in February 2016, and the most recent RBMP data available on the online Catchment Data Explorer is from 2019.

1.3.4 The WFD requires water bodies to be classified according to their current condition (i.e. the 'Status' or 'Potential,' depending on whether they are heavily modified or artificial water bodies) and to set a series of objectives for maintaining or improving conditions so that water bodies maintain or reach Good Status or Potential.

1.3.5 The Environment Agency is under a duty to exercise its relevant functions so as to best secure that the requirements of WFD for the achievement of environmental objectives are co-ordinated. The Planning Inspectorate's Advice Note 18 (Ref. 4) summarises the overall aims and objectives of the WFD as to::

a. Enhance the status and prevent further deterioration of surface water bodies, groundwater bodies and their ecosystems;
b. Ensure progressive reduction of groundwater pollution;
c. Reduce pollution of water, especially by Priority Substances and Certain Other Pollutants;
d. Contribute to mitigating the effects of floods and droughts;
e. Promote sustainable water use; and
f. Achieve at least good surface water status for all surface water bodies and good chemical status in groundwater bodies by 2015 (or good ecological potential in the case of artificial or heavily modified water bodies).

1.3.6 As a result, new developments that have the potential to impact on current or predicted WFD status are required to assess their compliance against the WFD objectives of the potentially affected water bodies.

2 Methodology

2.1.1 Guidance on how to undertake WFD assessments can be found in the 'Water Framework Directive risk assessment - How to assess the risk of your activity' (Ref. 3), 'The Water Framework Directive - Advice note eighteen: The Water Framework Directive' (Ref. 4), and on the You.Gov website. These guidance documents have informed the approach taken in this scoping assessment.

2.1.2 In accordance with best practice guidance a stepwise approach consisting of screening, scoping and detailed impact assessment phases is generally followed to meet the requirements of the WFD:

a. **Stage 1 - Screening**: The aim of screening is to identify the scheme components and activities that could affect WFD status and 'screen out' aspects of the project that do not require any further consideration. These may include, for example activities which have been ongoing since before the current RBMP plan cycle and which have thus formed part of the baseline or those that will not impact water bodies in any way.

b. **Stage 2 - Scoping**: Scoping is required to identify risks of the Scheme's activities and constituent parts to receptors based on the relevant water bodies and their water quality elements (including information on status, objectives, and the parameters for each water body).

c. **Stage 3 – Detailed Impact Assessment**: A detailed assessment of water bodies and their quality elements that are considered likely to be affected by the Scheme, identification of any areas of non-compliance; consideration of mitigation measures, enhancements, and contributions to the RBMP objectives. In undertaking the assessment all WFD quality elements should be considered including biology, water quality, hydromorphology, and protected areas. It is also important to consider the risk from non-native invasive species, where relevant.

2.1.3 Where the potential for deterioration of water bodies is identified, and it is not possible to mitigate the impacts to a level where deterioration or failure to improve can be avoided, the project would need to be assessed in the context of Article 4.7 of the Directive. Where a derogation is necessary, Applicants will need to provide the necessary information to justify their case, bearing in mind that Applicants must always seek to avoid deterioration of the water environment. It is a matter for the Secretary of State to consider whether derogation under Article 4.7 is justified in relation to a Proposed Development. At this stage a derogation under Article 4.7 is not considered necessary.

2.2 Desk Study

2.2.1 A desk-based study was carried out to capture information pertaining to the Scheme to support the understanding of baseline conditions. Reviewal of relevant information relating to the study area was undertaken to develop a baseline overview for WFD catchments, watercourses and surrounding areas. The following data sources were used for the desk study:

a. Contemporary Ordnance Survey (OS) maps (Ref. 5);
b. British Geological Survey maps (Ref. 6);
c. Aerial photography (Ref. 7);
d. Historical maps (Ref. 8);
e. Designated areas;
f. WFD status and objectives from the appropriate River Basin Management Plan for cycle 2 data, available from the Catchment Data Explorer (Ref. 9);
g. Hydrological information (Ref. 10); and rainfall data (Ref. 11)
h. Environment Agency ecology data (Ref. 12); and
i. Soilscapes (Ref. 13).

2.3 Field Survey

Water Environment Walkover Survey

2.3.1 A site walkover was carried out on the 28th and 29th January 2021 by staff specialising in water science, hydromorphology and aquatic ecology. The aim of the site visit was to further develop the baseline understanding of the water bodies local to the Order limits which may be affected by the Scheme and consider potential enhancement opportunities.

2.3.2 Best efforts were made to visit each water body and survey a suitable length of the water body which may be impacted by the Scheme during the walkover survey. However, due to access limitations, some of the smaller water bodies, which are field drains and artificial drains, were not visited. For other water bodies, the length of the water body surveyed was limited in places due to access, surface water flooding, and daylight constraints. Therefore, a second site walkover was carried out on the 11th October 2021 to survey the water bodies not previously visited, focusing on the locations where they may be potentially impacted by the scheme. As a result, it is considered that sufficient walkover surveys have been conducted for the purpose of this assessment.

3 WFD screening and scoping

3.1 WFD screening

3.1.1 The purpose of the WFD screening stage is to identify a zone of influence of the Scheme and to determine whether that influence has the potential to adversely impact upon WFD water body receptors. A study area of generally 1 km around the Order limits has been considered.

3.1.2 The screening stage also identifies specific activities of the Scheme that could affect receptor water bodies' WFD status and carries them forward to subsequent stages of the assessment process. Justification is provided where water body receptors are screened out and are not carried forward through the assessment.

Screening of water bodies

3.1.3 The proposed Scheme interacts with a number of WFD water bodies. WFD Screening of these water bodies is provided in **Table 1**. Water bodies such as smaller tributaries within each of the WFD water body catchments that may be impacted by the Scheme will be considered in this assessment. Any other remaining downstream water bodies not mentioned below are considered sufficiently far downstream to avoid impacts of the Scheme and are therefore screened out of further assessment.

Table 1 WFD screening of water bodies with the potential to be impacted by the Scheme

WFD Water Body	Potential Risk	Screening Outcome
Surface Water Bodies		
Kennett - Lee Brook (GB105033043020) (Lee Brook)	WFD water bodies may be directly impacted by the Scheme due to a range of activities that would interact with the local watercourse network during construction, operation and decommissioning phases of development.	In
Lark downstream of Mill Street Bridge (GB105033043052)		In
Kennett-Lee Brook (GB105033042990) (River Kennet)		In
Lee Brook (GB105033042970)		In
Soham Lode (GB105033042860)		In
New River (GB105033042780)		In
Burwell Lode (GB105033042720)		In
Groundwater Bodies		

WFD Water Body	Potential Risk	Screening Outcome
Cam and Ely Ouse Chalk (GB40501G400500)	Activities relating to the construction and operation of the Scheme have been assessed in terms of their potential impact upon this groundwater water body. There are potential anticipated impacts at the water body scale, therefore assessment of impacts to groundwater is scoped in.	In

Screening of Scheme Components and Activities

3.1.4 As described in Section 1.1 the Scheme comprises a number of activities that present a potential risk to the WFD status of water bodies. These components and activities are listed in **Table 2** together with a screening assessment.

Table 2 WFD screening of the Scheme's development activities against WFD quality elements

Component/ Activity	Description	Screening Outcome	Justification
Applicable to all surface water bodies scoped in unless specific water bodies are referred to.			
Solar PV modules and mounting structures	Panels will be mounted on poles above the ground, rather than raising the ground. This will avoid creation of an impermeable surface on the ground or the need for extensive earthworks. Solar PV panels will also not be located within 10m of the edge of watercourses defined broadly by the position of the main channel and normal flow water's edge.	Out	Runoff from the solar PV panels would alter existing routing of runoff. However, swales will be constructed to convey surface water runoff to detention basins, where it would infiltrate to the ground to replicate current drainage. Solar panels are robustly manufactured and require considerable force to break. Small quantities of potentially hazardous chemicals found inside are unlikely to leak, and not in large quantities. This would ensure no increase in surface water discharge to nearby water bodies or significant change in field runoff characteristics. In addition, the risk of agricultural diffuse pollution would be reduced from the change in land use as the application of agro-chemicals, inorganic and organic fertilisers to crops, and soil erosion from livestock poaching of river banks will no longer occur in panelled fields. Solar panels will likely be mounted on galvanized steel poles, or struts, approximately 2-3.5m in depth depending on ground conditions and installation method (e.g. ramming, ground screw). The struts should not be sufficiently deep to create preferential flow pathways to groundwater or effect lateral groundwater flows. The structures are anticipated to be above the Chalk aquifer water table at Sunnica West Site A, estimated to be at 15-20m AOD, where ground levels are generally above 22m AOD, and therefore will not affect groundwater flow to Chippenham Fen Site of Special Scientific Interest (SSSI), other protected areas or groundwater abstractions; further detail is included in **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1]**. Local changes in runoff patterns due to the presence of the solar panels may result in a small, insignificant change to the recharge distribution of groundwater. This is not considered to have an impact on groundwater levels or groundwater dependent receptors. Overall, there should be no increase of runoff, pollutants or sediments delivered to nearby water bodies resulting from this Scheme component and activity, therefore there is no risk of change to WFD quality elements.

Component/ Activity	Description	Screening Outcome	Justification
Infrastructure – buildings, compounds	An electrical compound comprising a substation and control building; offices / warehouses will be located in Sunnica East Site A and Sunnica East Site B for management and maintenance of the Order limits, it is anticipated up to 17 permanent staff will be onsite during a single shift; construction laydown areas.	Out	There will be no permanent above ground infrastructure located within 10m of a water body (measured from the edge of watercourses defined broadly by the position of the main channel and normal flow water's edge). Scheme plans have been reviewed and there are no proposed compounds, temporary or permanent, within 10m of any water bodies. Scheme drainage is considered separately.
Scheme drainage	To prevent ponding around solar panels or overland flow routes directing runoff off-site, a series of swales and infiltration basis will be constructed within low spots of the solar panel fields to collect and store runoff and allow it to infiltrate to the ground.	Out	The proposed surface water drainage strategy aims to mimic the natural drainage conditions of the Sites where possible. The number of treatment train components for permanent above ground infrastructure compounds has been determined using a water quality risk assessment using the Simple Index Approach set out in the SuDS Manual (Ref. 14). This is presented in the Drainage Strategy (see in Appendix F to the FRA (**Appendix 9C** of the Environmental Statement **[EN010106/APP/6.2]**)).

Component/ Activity	Description	Screening Outcome	Justification
	Surface water runoff from infrastructure will be managed according to a Drainage Strategy (see in Appendix F to the FRA (**Appendix 9C** of the Environmental Statement **[EN010106/APP/6.2]**)). Foul drainage would be directed to a self-contained foul drainage system to a septic tank or similar. These tanks would be regularly emptied under contract with a registered recycling and waste management contractor.		There is a small risk from the use of chemicals and equipment for the management and maintenance. However, this will be minimised by the implemented of an Operation Environmental Management Plan (OEMP) (an Outline OEMP is provided in **Appendix 16F** of the Environmental Statement **[EN010106/APP/6.2]**) that will require regular visual inspections of solar PV panels and supporting infrastructure, and pollution prevention measures. The locations of proposed swales and drainage basins have been reviewed, and they will not interact with any local water bodies. This means that the proposed drainage of the Sites should not provide a mechanism for transport of any sediment or pollutants to water bodies. In addition, there will be no new structures associated to drainage constructed on any water bodies, and therefore no hydromorphological impacts to water bodies. As the drainage strategy aims to mimic existing drainage it is not anticipated there will be any significant change in flow through water bodies of the Sites. Foul drainage will not be generated in large quantities and will be appropriately managed. Overall, there is no risk of change to WFD quality elements.
Internal access roads and car parking	To facilitate transport around the Sites.	In	The current access plan includes the requirement for two watercourse crossings, one on a minor tributary of the River Lark Downstream of Mill Street Bridge, and another on a minor tributary to Soham Lode. These watercourse crossings may impact WFD quality elements so are screened into this assessment.

Battery storage compounds – fire risk and management	The operational site design will include both fire water tanks and associated fire water containment. Fire water will be stored on site at the three Battery Storage System (BESS) compounds (one in each of Sunnica East Site A, Sunnica East Site B, and Sunnica West Site A) in either two half capacity sectional steel panel tanks or two half capacity cylindrical steel panel tanks. Each BESS compound will store 242.5m^3 of water. Associated with these fire water storage areas the drainage design also allows for fire water containment by providing a bunded lagoon with a 410m^3 capacity. It is not anticipated that active fire fighting would be undertaken as this can spread chemicals used in the process and which are potentially	Out	The use of water with no additives will remove the risk of chemicals from extinguishers entering surface runoff and draining to water bodies. Containing and testing wastewater from fire-fighting operations, and disposing of it off-site if required, will avoid the risk of any contaminated or hot water entering water bodies.

Component/ Activity	Description	Screening Outcome	Justification
	harmful to the water environment. Instead, any apparatus or containers that catch fire will be allowed to burn out. Water will be sprayed onto adjacent containers to keep them cool and reduce the risk of the fire spreading. The water used will therefore be less likely to be contaminated but will still be directed to the fire water storage areas from where decisions about suitable disposal can be made post incident. The method of directing fire-fighting water to the dedicated storage will be determined post-consent. If required, storage basins could be lined to prevent any infiltration of fire-fighting water to ground.		

Component/ Activity	Description	Screening Outcome	Justification
Substation and BESS	Piling may be required for the foundation of the BESS and substations. If required it would be in the form of augured piles, likely to a depth of 6m but possibly up to 12m deep.	In	The piles are likely to encounter groundwater at this depth. There are potential impacts to groundwater from the auguring and possible spillages.
Intrusive crossing of water body. *With reference to Figure 1 in Annex 1 and Figure 3.23* ***Chapter 3: Scheme Description*** *of the Environmental Statement* ***[EN010106/APP/6.2.3-23]****, this applies to: Tributary of Lark Downstream of Mill Street Bridge WFD water body; drain within Soham Lode WFD water body catchment; two drains within the New River WFD water body catchment; and works within the Cam and Ely Ouse Chalk Groundwater body.*	Cables will be installed beneath the bed of the watercourse. This 'intrusive crossing' installation technique is understood to involve temporarily diverting the watercourse (through a pipe or flume or by over-pumping around the working area) whilst the bed, and therefore banks are excavated to a depth where cables will be laid. The watercourse will subsequently be re-instated.	In	There is potential for direct impacts to the riparian zone and channel and increased fine sediment delivery to water bodies and pollution of water bodies during construction works. Although construction works will be completed within a matter of days to few weeks, the impact on riparian habitat will persist until vegetation re-establishes.

Component/ Activity	Description	Screening Outcome	Justification
Non-intrusive crossing of water body. *With reference to Figure 1 in Annex 1 and Figure 3.23* ***Chapter 3: Scheme Description*** *of the Environmental Statement* ***[EN010106/APP/6.2.3-23]****, this applies to: Kennett – Lee Brook (Lee Brook); Kennett-Lee Brook (River Kennett), two drains and the River Snail within Soham Lode WFD water body; New River, Tributary of New River and drains within New River WFD Water body; Catch Water Drain, numerous drains and Burwell Lode (Burwell Lode WFD water body); and Cam and Ely Ouse Chalk Groundwater body.*	Cables will be installed beneath the bed of the watercourse. This 'non-intrusive crossing' technique is understood to involve digging launch and receive pits that will be set back from the water's edge of the normal flow channel extent by a minimum of 10 m, drilling beneath the watercourse bed, to avoid disruption to the channel, will then take place to enable the cables to be installed. The cables will be installed to a minimum depth of 2m. This is considered to be a worst-case, as at greater depth the quantity of groundwater flow is typically less than in the shallower chalk.	In	Potential direct impacts to the channel and riparian zone should be avoided by this technique. Indirect impacts from uncontrolled release of construction site runoff that may include high levels of fine sediment, oils and drilling muds (water based) is a possibility if this runoff is not carefully managed. However, potential impacts from groundwater ingress to excavations and the risk of 'break out' of drilling muds into watercourses.

Component/ Activity	Description	Screening Outcome	Justification
Rail and A11 road crossings by the cable corridor.	Excavations and directional drilling associated to cable crossings of the railway and the A11 road.	In	There are potential impacts from groundwater ingress to excavations.
Crossings by the cable corridor of roads, hedgerows, public rights of way, and utilities.	Excavations associated to the cable crossings, which are mostly to be carried out using intrusive techniques.	Out	Excavated trenches will be temporary, transient, and shallow, up to 2m deep. Construction pollution risks will be managed using standard best practice. No impacts are anticipated on groundwater resources. Any non-intrusive (underground) crossings of such features are typically to be crossed at the same time as a non-intrusive water body crossing; therefore given the scale of the groundwater body, impacts will be considered through the assessment of the non-intrusive water body crossings.
Burwell National Grid Substation Extension	Two options for the extension are considered within this assessment: Option 1, which would involve infilling and diverting an approximate 60m length of drainage channel, and Option 2, which would require a minor diversion of a water body.	Out	Option 1 is screened out of the assessment as the infilling and diversion of the drainage channel would not result in any net loss of habitat or change to WFD quality elements of the water body, and the water body is ephemeral and artificial. Furthermore, any indirect impacts through construction will be mitigated through the CEMP and WMP (a Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2])**. Option 2 is screened out as the minor drain diversion required for the road widening would not result in any net loss of habitat or change to WFD quality elements of the water body, and the water body is ephemeral and artificial. Furthermore, any indirect impacts through construction will be mitigated through the CEMP and WMP (a Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2])**.

3.2 Stage 2: WFD scoping

3.2.1 The WFD scoping stage defines the level of detail required for further WFD assessment. This includes identifying risks to the WFD receptors from the Scheme's activities. The scoping stage assessment is presented in **Table 3**.

Table 3 WFD scoping of the Scheme's components and activities against WFD quality elements

WFD Quality Element	Risk to receptor (Yes / No)	Scoping Outcome Reasoning
Biological Quality Elements		
Fish	Yes	Temporary blockages in longitudinal connectivity from intrusive crossing methods of water bodies, and watercourse crossings required for site access. Potential for loss of biological continuity resulting in interference with fish population movements and blocking the exchange of individuals among populations, reducing gene flow and disrupting the ability of 'source' populations to support declining populations nearby. Potential direct impact on fish populations from disturbance of the bed and / or release of contaminated construction site runoff, including the risk of 'break out' during directional drilling operations.
Invertebrates	Yes	Intrusive crossings of water bodies may cause direct mortality of invertebrates or the smothering of habitat with fine sediment. Non-intrusive crossings of water bodies could result in spillage or 'break out' of drilling fluids or pollutants which may impact invertebrates. Watercourse crossings required for site access may interrupt continuity of invertebrate communities.
Macrophytes and phytobenthos combined	Yes	Intrusive crossings of water bodies may cause the removal of macrophytes, and removal of the bed or macrophytes supporting phytobenthos. Similar impacts could arise from installation of watercourse crossings for site access. Non-intrusive crossings of water bodies could result in spillage of drill fluids or pollutants which may impact macrophytes and phytobenthos.
Physico-chemical Quality Elements		
Thermal Conditions	No	Intrusive crossings may alter the level of shading to water bodies following potential riparian vegetation removal, watercourse crossings for site access will also locally cause shading. However this will be at a very local scale and would not alter the water body water temperature.
Oxygenation conditions	Yes	Non-intrusive crossings of water bodies may increase loads of fine sediment and organic material to water bodies and decrease levels of dissolved oxygen.

WFD Quality Element	Risk to receptor (Yes / No)	Scoping Outcome Reasoning
Salinity	No	Other than the potential use of de-icants, no materials that may alter the salinity of water bodies will be used in the Scheme or during construction. The CEMP will prescribe measures for controlling potentially polluting materials during construction.
Acidification Status	No	No materials that may alter the pH of water bodies are proposed for use in the Scheme. The CEMP will prescribe measures for controlling potentially polluting materials during construction.
Nutrient Conditions	Yes	Non-intrusive and intrusive crossings of water bodies may increase sediment loads to watercourses and organic material from site clearance works. However, the impact will be localised, short term and temporary. Construction risks can also be effectively managed using standard mitigation measures. Overall, the scheme will likely reduce the flux of agricultural diffuse pollutants (sediment and excess nutrients) into watercourses as they flow through the Order limits.
Hydromorphological Quality Elements		
Quantity and Dynamics of Water Flow	No	There is no mechanism for either cable crossing method to impact this element; intrusive crossings will preferably be carried out during dry periods or maintain water body flow by installation of a pipe or flume or by over-pumping the flow for the relatively short duration of the works.
Connection to Groundwater Bodies	No	Cables will cross beneath water bodies and other infrastructure but this should not impact connectivity to groundwater bodies due to the small scale of activity compared to water body size. Watercourse crossings for site access may also present a barrier to connection with groundwater bodies, but this will be extremely localised and would not present an impact at the water body scale.
River Continuity	Yes	Intrusive crossings will present a temporary blockage to continuity whilst excavation takes place. Watercourse crossings for site access can also interrupt river continuity. There is no mechanism for non-intrusive crossings to affect this quality element.
River Depth and Width Variation	Yes	Intrusive crossings may lead to local changes in channel profile to impact this element. Watercourse crossings for site access would also impact this element locally by their uniform, unchangeable nature.
Structure and Substrate of the River Bed	Yes	Intrusive crossings may lead to local changes in bed substrate to impact this element. Watercourse crossings for site access can present an interruption to the natural bed substrate.

WFD Quality Element	Risk to receptor (Yes / No)	Scoping Outcome Reasoning
Structure of the Riparian Zone	Yes	Intrusive crossings will involve digging below the watercourse bed, which will inevitably involve disruption of the watercourse banks and the riparian zone as they will be temporarily removed before being reinstated. Non-intrusive crossings will also involve excavations each side of river banks but these will be set back by a minimum of 10m from the normal flow channel/ water's edge. Watercourse crossings for site access can locally disconnect the river channel from the riparian zone.
Groundwater Quality Elements		
Quantitative Elements	Yes	There are potential impacts from groundwater ingress to excavations for non-intrusive crossings on certain water bodies, roads and the railway. Impacts may also arise from installation of cables below the water table, for crossings of the railway and A11.
Chemical Elements	Yes	There are potential impacts from groundwater ingress to excavations for non-intrusive crossings on certain water bodies, roads and the railway. There are potential impacts from piling for the BESS and substation foundations. Impacts may also arise from installation of cables below the water table, for crossings of the railway and A11.

4 Baseline conditions

4.1 WFD status

WFD status – surface water

4.1.1 The following tables provide the WFD status of the following WFD surface water bodies:

a. Kennett – Lee Brook (GB105033043020) (Lee Brook) - **Table 4**;
b. Lark downstream of Mill Street Bridge (GB105033043052) - **Table 5**;
c. Kennett-Lee Brook (GB105033042990) (River Kennett) - **Table 6**;
d. Lee Brook (GB105033042970) - **Table 7**;
e. Soham Lode (GB105033042860) - **Table 8**;
f. New River (GB105033042780) -
g. **Table** 9; and
h. Burwell Lode (GB105033042720) - **Table 10**.

Table 4 WFD Surface Water Body classification details of the Kennett – Lee Brook (GB105033043020) WFD Water Body

RBMP Parameter	Kennett – Lee Brook Cycle 2 2019 Classification
RBMP	Anglian RBMP
Water body Name and ID	Kennett – Lee Brook (GB105033043020)
Water Body Type	Heavily modified
Length	4.033 km
Catchment area	7.752 km^2
Overall Ecological Potential	**Poor**
Chemical Status	**Fail**
Downstream Water body	Ely Ouse (South Level)
Supporting elements (Surface Water)	**Good**
Mitigation Measures Assessment	Good
Biological Quality Elements	***Poor***
Macrophytes and phytobenthos combined	Moderate
Fish	Poor
Invertebrates	High
Physico-Chemical Parameters	***High***
Ammonia (phys-chem)	High
Dissolved Oxygen	High
pH	High
Phosphate	High
Temperature	High
Hydromorphological Supporting Elements	***Supports Good***

RBMP Parameter	Kennett – Lee Brook Cycle 2 2019 Classification
Hydrological regime	Does Not Support Good
Specific Pollutants	***Not Assessed***
Priority Substances	***Good***
Cypermethrin (Priority hazardous)	Good
Fluoranthene	Good
Other Pollutants	Does Not Require Assessment
Priority Hazardous Substances	***Fail***
Polybrominated diphenyl ethers (PBDE)	Fail
Perfluorooctane sulphonate (PFOS)	Good
Benzo(a)pyrene	Good
Dioxins and dioxin-like compounds	Good
Heptachlor and cis-Heptachlor epoxide	Good
Hexabromocyclododecane (HBCDD)	Good
Hexachlorobenzene	Good
Hexachlorobutadiene	Good
Mercury and Its Compounds	Good

Table 5 WFD Surface Water Body classification details of the Lark downstream of Mill Street Bridge (GB105033043052) WFD Water Body

RBMP Parameter	Lark Downstream of Mill Street Bridge Cycle 2 2019 Classification
RBMP	Anglian RBMP
Water body Name and ID	Lark downstream of Mill Street Bridge (GB105033043052)
Water Body Type	Heavily modified
Length	5.532 km
Catchment area	21.276 km^2
Overall Ecological Potential	**Moderate**
Chemical Status	**Fail**
Downstream Water body	Ely Ouse (South Level)
Supporting elements (Surface Water)	**Moderate**
Mitigation Measures Assessment	Moderate or less
Biological Quality Elements	***High***
Invertebrates	Good
Physico-Chemical Parameters	***Moderate***
Acid Neutralising Capacity	High
Biochemical Oxygen Demand (BOD)	High
Ammonia (phys-chem)	High
Dissolved Oxygen	High

RBMP Parameter	Lark Downstream of Mill Street Bridge Cycle 2 2019 Classification
pH	High
Phosphate	Moderate
Temperature	High
Hydromorphological Supporting Elements	***Supports Good***
Hydrological regime	Supports Good
Specific Pollutants	***High***
Manganese	High
Iron	High
Priority Substances	***Good***
Cypermethrin (Priority hazardous)	Good
Fluoranthene	Good
Other Pollutants	Does Not Require Assessment
Priority Hazardous Substances	Fail
Polybrominated diphenyl ethers (PBDE)	Fail
Perfluorooctane sulphonate (PFOS)	Good
Benzo(a)pyrene	Good
Dioxins and dioxin-like compounds	Good
Heptachlor and cis-Heptachlor epoxide	Good
Hexabromocyclododecane (HBCDD)	Good
Hexachlorobenzene	Good
Hexachlorobutadiene	Good
Mercury and Its Compounds	Good

Table 6 WFD Surface Water Body classification details of the Kennett-Lee Brook (GB105033042990) WFD Water Body

RBMP Parameter	Kennett–Lee Brook Cycle 2 2019 Classification
RBMP	Anglian RBMP
Water body Name and ID	Kennett–Lee Brook (GB105033042990)
Water Body Type	Heavily modified
Length	25.104 km
Catchment area	82.408 km^2
Overall Ecological Potential	**Moderate**
Chemical Status	**Fail**
Downstream Water body	Kennett – Lee Brook
Supporting elements (Surface Water)	**Moderate**
Mitigation Measures Assessment	Moderate or less
Biological Quality Elements	***Moderate***
Macrophytes and Phytobenthos combined	Moderate

RBMP Parameter	Kennett–Lee Brook Cycle 2 2019 Classification
Fish	Not assessed (was bad in 2015)
Physico-Chemical Parameters	***Moderate***
Biochemical Oxygen Demand (BOD)	High (in 2016, not monitored in 2019)
Ammonia (phys-chem)	High
Dissolved Oxygen	Good
pH	High
Phosphate	Moderate
Temperature	High
Hydromorphological Supporting Elements	***Supports Good***
Hydrological regime	Does Not Support Good
Priority Substances	Good
Cypermethrin (Priority hazardous)	Good
Fluoranthene	Good
Other Pollutants	Does Not Require Assessment
Priority Hazardous Substances	Fail
Polybrominated diphenyl ethers (PBDE)	Fail
Perfluorooctane sulphonate (PFOS)	Good
Benzo(a)pyrene	Good
Dioxins and dioxin-like compounds	Good
Heptachlor and cis-Heptachlor epoxide	Good
Hexabromocyclododecane (HBCDD)	Good
Hexachlorobenzene	Good
Hexachlorobutadiene	Good
Mercury and Its Compounds	Good

Table 7 WFD Surface Water Body classification details of the Lee Brook (GB105033042970) WFD Water Body

RBMP Parameter	Lee Brook Cycle 2 2019 Classification
RBMP	Anglian RBMP
Water body Name and ID	Lee Brook (GB105033042970)
Water Body Type	Heavily modified
Length	4.84 km
Catchment area	16.655 km^2
Overall Ecological Potential	**Moderate**
Chemical Status	**Fail**
Downstream Water body	Kennett – Lee Brook
Supporting elements (Surface Water)	**Good**

RBMP Parameter	Lee Brook Cycle 2 2019 Classification
Mitigation Measures Assessment	Good
Physico-Chemical Parameters	***Moderate***
Ammonia (phys-chem)	High
Dissolved Oxygen	Good
pH	High
Phosphate	Poor
Temperature	High
Hydromorphological Supporting Elements	***Supports Good***
Hydrological regime	Does Not Support Good
Specific Pollutants	***Not Assessed***
Priority Substances	***Good***
Cypermethrin (Priority hazardous)	Good
Fluoranthene	Good
Other Pollutants	Does Not Require Assessment
Priority Hazardous Substances	***Fail***
Polybrominated diphenyl ethers (PBDE)	***Fail***
Perfluorooctane sulphonate (PFOS)	Good
Benzo(a)pyrene	Good
Dioxins and dioxin-like compounds	Good
Benzo(b)fluoranthene	Fail
Benzo(g-h-i)perylene	Fail
Benzo(k)fluoranthene	Fail
Heptachlor and cis-Heptachlor epoxide	Good
Hexabromocyclododecane (HBCDD)	Good
Hexachlorobenzene	Good
Hexachlorobutadiene	Good
Mercury and Its Compounds	Good

Table 8 WFD Surface Water Body classification details of the Soham Lode (GB105033042860) WFD Water Body

RBMP Parameter	Soham Lode Cycle 2 2019 Classification
RBMP	Anglian RBMP
Water body Name and ID	Soham Lode (GB105033042860)
Water Body Type	Heavily modified
Length	18.88 km
Catchment area	66.503 km^2
Overall Ecological Potential	**Moderate**
Chemical Status	**Fail**
Downstream Water body	Ely Ouse (South Level)

RBMP Parameter	Soham Lode Cycle 2 2019 Classification
Supporting elements (Surface Water)	**Moderate**
Mitigation Measures Assessment	Moderate or less
Biological Quality Elements	***Good***
Fish	Good
Invertebrates	Good
Physico-Chemical Parameters	***Moderate***
Biochemical Oxygen Demand (BOD)	High (2016 classification)
Ammonia (phys-chem)	High
Dissolved Oxygen	High
pH	High
Phosphate	Moderate
Temperature	High
Hydromorphological Supporting Elements	***Supports Good***
Hydrological regime	Supports Good
Specific Pollutants	***High***
Manganese	High
Copper	High
Iron	High
Zinc	High
Priority Substances	***Good***
Cypermethrin (Priority hazardous)	Good
Fluoranthene	Good
Nickel and its compounds	Good
Lead and its compounds	Good
Other Pollutants	Does Not Require Assessment
Priority Hazardous Substances	Fail
Polybrominated diphenyl ethers (PBDE)	Fail
Perfluorooctane sulphonate (PFOS)	Good
Benzo (b) and (k) fluoranthene	Good (2016)
Benzo (ghi) perelyene and indeno (123-cd) pyrene	Good (2016)
Benzo(a)pyrene	Good
Cadmium and its compounds	Good
Dioxins and dioxin-like compounds	Good
Benzo(b)fluoranthene	Good
Benzo(g-h-i)perylene	Good
Benzo(k)fluoranthene	Good
Heptachlor and cis-Heptachlor epoxide	Good
Hexabromocyclododecane (HBCDD)	Good
Di(2-ethylhexyl)phthalate (priority hazardous)	Good

RBMP Parameter	Soham Lode Cycle 2 2019 Classification
Hexachlorobenzene	Good
Hexachlorobutadiene	Good
Mercury and its compounds	Good
Nonylphenol	Good

Table 9 WFD Surface Water Body classification details of the New River (GB105033042780) WFD Water Body

RBMP Parameter	New River Cycle 2 2019 Classification
RBMP	Anglian RBMP
Water body Name and ID	New River (GB105033042780)
Water Body Type	Heavily modified
Length	9.489 km
Catchment area	58.531 km^2
Overall Ecological Potential	**Moderate**
Chemical Status	**Fail**
Downstream Water body	Burwell Lode
Supporting elements (Surface Water)	**Moderate**
Mitigation Measures Assessment	Moderate or less
Biological Quality Elements	***Good***
Macrophytes and Phytobenthos combined	Good
Invertebrates	High
Physico-Chemical Parameters	***High***
Ammonia (phys-chem)	High
Dissolved Oxygen	High
pH	High
Phosphate	High
Temperature	High
Hydromorphological Supporting Elements	***Supports Good***
Hydrological regime	Does Not Support Good
Specific Pollutants	***Not assessed in 2016***
Priority Substances	***Good***
Cypermethrin (Priority hazardous)	Good
Fluoranthene	Good
Other Pollutants	Does Not Require Assessment
Priority Hazardous Substances	***Fail***
Polybrominated diphenyl ethers (PBDE)	Fail
Perfluorooctane sulphonate (PFOS)	Good
Benzo(a)pyrene	Good
Dioxins and dioxin-like compounds	Good

RBMP Parameter	New River Cycle 2 2019 Classification
Heptachlor and cis-Heptachlor epoxide	Good
Hexabromocyclododecane (HBCDD)	Good
Hexachlorobenzene	Good
Hexachlorobutadiene	Good
Mercury and Its Compounds	Good

Table 10 WFD Surface Water Body classification details of the Burwell Lode (GB105033042720) WFD Water Body

RBMP Parameter	Burwell Lode Cycle 2 2019 Classification
RBMP	Anglian RBMP
Water body Name and ID	Burwell Lode (GB105033042720)
Water Body Type	Heavily modified
Length	11.106 km
Catchment area	40.516 km^2
Overall Ecological Potential	**Moderate**
Chemical Status	**Fail**
Downstream Water body	Cam
Supporting elements (Surface Water)	**Moderate**
Mitigation Measures Assessment	Moderate or less
Biological Quality Elements	***Moderate***
Macrophytes and Phytobenthos combined	Moderate
Invertebrates	High
Physico-Chemical Parameters	***High***
Acid Neutralising Capacity	***High***
Biochemical Oxygen Demand (BOD)	High
Ammonia (phys-chem)	High
Dissolved Oxygen	High
pH	High
Phosphate	High
Temperature	High
Hydromorphological Supporting Elements	***Supports Good***
Hydrological regime	Supports Good
Specific Pollutants	***High***
Copper	High
Iron	High
Priority Substances	***Good***
Cypermethrin (Priority hazardous)	Good
Fluoranthene	Good
Nickel and its compounds	Good

RBMP Parameter	Burwell Lode Cycle 2 2019 Classification
Other Pollutants	Does Not Require Assessment
Priority Hazardous Substances	Fail
Brominated diphelyether (PBDE)	Fail
Perfluorooctane sulphonate (PFOS)	Fail
Benzo(a)pyrene	Good
Cadmium and its compounds	Good
Dioxins and dioxin-like compounds	Good
Heptachlor and cis-Heptachlor epoxide	Good
Hexabromocyclododecane (HBCDD)	Good
Di(2-ethylhexyl)phthalate (priority hazardous)	Good
Hexachlorobenzene	Good
Hexachlorobutadiene	Good
Mercury and its compounds	Good
Nonylphenol	Good

WFD status – groundwater

4.1.2 The Cam and Ely Ouse Chalk (GB40501G400500) WFD Water Body underlies the study area. The WFD classification of the Cam and Ely Ouse Chalk groundwater body is provided in **Table 11**.

Table 11 WFD Groundwater Body classification details of the Cam and Ely Ouse Chalk (GB40501G400500) WFD Water Body

RBMP Parameter	Cam and Ely Ouse Chalk Cycle 2 2019 Classification
Water body Name and ID	Cam and Ely Ouse Chalk (GB40501G400500)
Water Body Type	Groundwater Body
Groundwater area	2995.774 km^2
Overall Ecological Status	**Poor**
Quantitative	**Poor**
Quantitative Status Elements	***Poor***
Quantitative Saline Intrusion	Good
Quantitative Water Balance	Good
Quantitative GWDTEs test	Good
Quantitative Dependent Surface Water Body Status	Poor
Chemical	**Poor**
Chemical Status Elements	***Poor***
Chemical Drinking Water Protected Area	Poor
General Chemical Test	Poor

RBMP Parameter	Cam and Ely Ouse Chalk Cycle 2 2019 Classification
Chemical GWDTEs test	Good
Chemical Dependent Surface Water Body Status	Good
Chemical Saline Intrusion	Good

4.2 Catchment Characteristics

General Characteristics

4.2.1 The Scheme is located within the Cam and Ely Ouse Management Catchment of the Anglian RBMP (Ref. 15). Sunnica East Site A, Sunnica East Site B, Sunnica West Site A and Cable Route A are within the Lark Operational Catchment. Sunnica West Site B and the Cable Route B are within the Cam and Ely Ouse Operational Catchment.

4.2.2 Sunnica East Site A is low lying and relatively flat; ground elevations across the Site range from 5 – 15m Above Ordnance Datum (AOD). The Site includes a crossing of the Kennett – Lee Brook (Lee Brook). The predominant land use across the site is arable farming, with smaller areas of improved grassland local to the Kennett – Lee Brook (Lee Brook).

4.2.3 Sunnica East Site B, located south of Worlington, is low lying and relatively flat; ground elevations across the Site generally range from 10 – 20m AOD, with some lower areas towards 5m AOD towards the watercourses within and adjacent to the Site, which fall within the Lark 'Downstream of Mill Street Bridge' WFD water body. A reach of the River Lark Tributary 1 (as shown on Figure 1 in Annex 1) lies within Sunnica East Site B, and will be crossed by Scheme infrastructure, whereas River Lark Tributary 2 is located just outside of the Order limits. The primary land use within the Site is for arable farming and horticulture with some areas of improved grassland also present.

4.2.4 Between Sunnica East Site B and Sunnica West Site A, the Kennett-Lee Brook (River Kennett) is crossed by Grid Connection A of the Scheme. Grid Connection Route A slopes northwards from approximately 20m AOD down to 15m AOD in the area of the Kennett-Lee Brook (River Kennett) crossing. Land use across the site is predominantly arable farming.

4.2.5 Ground levels within Sunnica West Site A range from 20-35m AOD, with the land generally sloping towards the north west border of the Site. The upper reaches of Lee Brook lie within the north western fringe of this Site, and an unnamed watercourse referred to on Figure 1 in Annex 1 as 'the Dane Hill watercourse' drains field W15 to the south of the A11, which is within the Kennet-Lee Brook WFD water body catchment. Land use is predominantly arable farming and horticulture, with some small areas of improved grassland and broadleaved or mixed woodland.

4.2.6 Sunnica West Site B is across a flat, low lying area with ground levels rising to the southeast from approximately 15 – 20m AOD. The River Snail, part of the Soham Lode WFD water body, runs through the western part of the Site, and borders the site further north. Land use is mostly arable farming.

4.2.7 To the west of Sunnica West Site B along Grid Connection B, the land is flat lying, between approximately 5m AOD near Burwell to 10-15m AOD as the route approaches Snailwell. The land use is predominantly arable farming, and the Scheme crosses the following water bodies:

a. Unnamed drain / tributary of the River Snail (Soham Lode WFD water body);
b. Unnamed drain adjacent to the A412, within the catchment of the New River WFD water body;
c. New River WFD water body, tributary of New River, and a number of tributaries / drains within the New River WFD water body catchment;
d. Catch Water drain and a number of land drains within the Burwell Lode WFD water body catchment; and
e. Burwell Lode WFD water body.

4.2.8 At the area of Burwell National Grid Substation Extension, the land is low lying at approximately 5m AOD. The land use is that associated with a Substation.

Catchment Geology and Soils

4.2.9 Baseline geology and soils data was reviewed across the study area using the British Geological Survey (Ref. 6) and Soilscapes (Ref. 13) online resources.

4.2.10 The bedrock across the Site is Chalk. Adjacent to the Kennett – Lee Brook (Lee Brook), Sunnica East Site A is underlain by River Terrace Deposits, comprising sand and gravel; Alluvium, comprising sand, clay, silt and gravel; as well as Peat, underlain by Chalk bedrock. The River Terrace Deposits in this area are in the order of 3m thick. West of the Kennett – Lee Brook (Lee Brook) the Site is underlain by Chalk, with no superficial deposits. East of the Kennett – Lee Brook (Lee Brook) the Site is underlain by Head deposits, comprising clay, silt, sand and gravel, underlain by Chalk bedrock. At the northern extent, the Site is underlain by Chalk with small areas of chalk overlain by Peat or Head deposits. Soils in Sunnica East Site A comprises both freely draining slight acid but base-rich soils, and freely draining lime rich loamy soils.

4.2.11 Sunnica East Site B is underlain by River Terrace Deposits, comprising sand and gravel, overlying Chalk in part, while in other areas the Site is directly overlying Chalk bedrock. Part of the Site south of Worlington is underlain by Head deposits comprising clay, silt, sand and gravel, overlying Chalk. The Head deposits in this area are in the order of 4m thick. Soils in the area of Sunnica East Site B comprise both freely draining lime rich loamy soils, freely draining slightly acid sandy soils, freely draining slight acid but base rich soils, and freely draining sandy Breckland soils.

4.2.12 The Grid Connection Route A is underlain by River Terrace Deposits, over a Chalk bedrock. At the location where the route crosses the Kennett-Lee Brook (River Kennett), alluvium in the order of 1.3m thick overlies Chalk. Soils in the southern part of the grid connection route are freely draining slightly acid sandy soils, passing into freely draining slightly acid but base-rich soils for the northern half.

4.2.13 Sunnica West Site A is underlain by River Terrace Deposits overlying Chalk. The River Terrace Deposits consist of sand and gravel and this area are in the order of 5m thick. The eastern part of the site that sits either side of the A11 is underlain by Lowestoft Formation comprising Till deposits overlying Chalk. The Till deposits in this area are in the order of 30m thick. Soils in Sunnica West Site A comprise mainly of both freely draining slightly acid but base rich soils, with an area of freely draining slight acid but base rich soils and an area of shallow lime rich soils.

4.2.14 In the western part of Sunnica West Site B, River Terrace Gravels consisting of sand and gravel overlie Chalk, and alluvium deposits comprising clay, silt, sand and gravel overlie the River Terrace Deposits. The alluvium and river terrace deposits in this area are in the order of 4m thick. Immediately to the north of Sunnica West Site B is Chippenham Fen, comprising peat deposits overlying Chalk. Across the majority of Sunnica West Site B, soils comprise shallow lime-rich soils, with an area of Fen peat soils in the north west, and freely draining slightly acid but base-rich soils in the east.

4.2.15 Grid Connection Route B is underlain by Chalk. Where the route crosses Soham Lode, it crosses superficial deposits of alluvium, and River Terrace Deposits immediately west of the watercourse. Soils in the eastern part of the grid connection route are freely draining slightly acid but base rich soils, passing into shallow lime rich soils over chalk or limestone for the majority of the route.

4.2.16 Burwell National Grid Substation Expansion is underlain by small areas of Peat which overlies the Chalk bedrock. The soils in the area of Burwell National Grid Substation are shallow lime-rich soils.

Catchment Hydrology

4.2.17 According to the Met Office weather station at Mepal (which is around 12km to the northwest) for the period 1981 to 2010, the Order limits did receive around 575mm of rainfall each year, and it rained on around 110 days per year (Ref. 11). In the context of the UK this typical annual rainfall is very low, with the western part of the UK experiencing over 800mm typically.

4.2.18 Information from a site at Moulton was received from the Environment Agency. This is located approximately 7km southeast of the Sunnica East Site A, and rainfall in the years 2013 – 2018 was in the range 513mm to 770mm, with an average of 604mm.

4.2.19 The National River Flow Archive website (Ref. 10) shows that there is a flow gauging station on the Kennett - Lee Brook at Beck Bridge (Station Ref 33023) approximately 1.3km northwards (and downstream) of Freckenham. The location

of the gauging station is where Beck Road crosses the Lee Brook within the southern area of Sunnica East Site A. The catchment area for this gauging station is 1.2km^2 at the location, with the elevation being just 3.9m AOD. The catchment itself is low in altitude in the northern section, increasing in elevation to approximately 122m AOD in the southern reaches. The rainfall in the area is 579mm per year (standard average annual rainfall (SAAR) 1961-1990). The Q95 flow (i.e. that which is exceeded 95% of the time) is 0.017m^3/s (period of measurement 1962-2018). The river has a Base Flow Index of 0.69, reflecting the relatively permeable nature of superficial deposits and soils within the catchment, and an influence of the Chalk bedrock. However, according to regional groundwater monitoring data (see Figure 3 in Annex 1 the river bed of the Kennett – Lee Brook (Lee Brook) is likely to be above the Chalk aquifer water table until the lowest reaches near to the confluence with the River Lark. Chalk groundwater contouring does not indicate groundwater converging on this watercourse, suggesting the Chalk aquifer would only provide baseflow to certain reaches rather than the entire length of river. Further baseline detail on groundwater is provided in **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1]**. The flow regime of the Kennett – Lee Brook (Lee Brook) is impacted by groundwater abstractions and abstractions for agricultural / industrial use (Ref. 10). Within 1km of Sunnica East Site A there are also a number of abstractions from the Kennett – Lee Brook (Lee Brook), predominantly for crop irrigation purposes.

4.2.20 The National River Flow Archive website (Ref. 10) records data for flow monitoring on the Lark at a gauging station at Isleham (Station Ref 33004) situated approximately 5 km northwest (and downstream) of Worlingham. The catchment area is 466 km^2 at the flow monitoring location, with the elevation being just 2.4m AOD. The rainfall in the area is 585mm per year (SAAR 1961-1990). The Q95 flow (that which is exceeded 95% of the time) is 0.439m^3/s (period of measurement 1936-1986). The river has a Base Flow Index of 0.64, reflecting the relatively permeable nature of superficial deposits and soils within the catchment, and the influence of the Chalk bedrock. The River Lark is located 750m north of the site, and the monitoring station is located 5km downstream. The River Lark closer to the Site is likely to have lower flow conditions than that monitored on the Lark at Isleham, as it is higher in the catchment. The River Lark Tributary 1, within Sunnica East Site B, appeared to be ephemeral during site observations, as some reaches of the stream were colonised by terrestrial vegetation or were dry.

4.2.21 No flow information is available for Lee Brook within Sunnica West Site A. Flow information for the Kennett – Lee Brook (Lee Brook) further downstream is presented in paragraph 4.2.19, however the relative catchment size of Lee Brook within Sunnica West Site A is much smaller than at the gauge at Beck Bridge. In addition, the grassy vegetation within the channel observed in site observations suggests Lee Brook through Sunnica West Site A may not have a permanent flow all year-round. No surface water abstractions are known to be located within Sunnica West Site A.

4.2.22 For the River Snail, the National River Flow Archive website (Ref. 10) provides details of a flow gauging station on the Snail at Fordham (Station Ref 33050)

situated just south of Fordham village (and downstream of Sunnica West Site B). The catchment area of the gauging station is 61km^2 at the location, with the elevation being 9.7m AOD. The catchment itself is low in altitude in the northern section, increasing in elevation to approximately 118m AOD in the southern/ south eastern reaches of the catchment. The rainfall in the area is 577mm per year (SAAR 1961-1990). The Q95 flow (that which is exceeded 95% of the time) is 0.106m^3/s (period of measurement 1960-2018). The river has a Base Flow Index of 0.88, this is close to a value expected from a chalk stream and reflects the permeable nature of superficial deposits and soils within the catchment, and an influence of the Chalk bedrock. The Base Flow Index suggests the river would have a relatively sustained, steady flow during periods of dry weather. However, the river bed of the River Snail is likely to be above the Chalk aquifer water table until the lowest reaches near to the confluence with Soham Lode. Chalk groundwater contouring based on regional groundwater monitoring data (see Figure 9-3 of **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1]**) does not indicate groundwater converging on this watercourse, suggesting the Chalk aquifer would only provide baseflow to certain reaches rather than the entire length of river. Further baseline detail on groundwater is provided in **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1]**.

Historical Channel Change

4.2.23 In the vicinity of and through Sunnica East Site A, The Kennett – Lee Brook (Lee Brook) is characterised by a heavily modified, lowland watercourse with an over straight planform (shown in Plate 1 in the hydromorphological quality elements baseline, Section 4.3.39). The watercourse has a low gradient and flows through a thin band of superficial alluvial deposits within an unconfined valley. Superficial deposits close to the confluence with the River Lark are shown as Peat. Bedrock through this reach is Chalk. The earliest available historic mapping dates back to 1885 (Ref. 8) where the Kennet-Lee Brook is already shown to be in its current alignment. Given the surrounding land use it is considered likely that realignment occurred before that date to make room for agriculture. Aerial imagery shows the watercourse is over straight and uniform suggesting little in the way of morphological or flow variation; this was confirmed by site observations.

4.2.24 Through Sunnica East Site B, the River Lark Tributary 1 flows through superficial deposits of Alluvium, River Terrace Deposits and Head deposits, overlying Chalk bedrock. The watercourse is artificially straight, characteristic of a drainage ditch, as shown in Plate 2 (Section 4.3.42). Historic mapping is available as far back as 1885 (Ref. 8) and the watercourse is not shown on this initial OS map. This suggests that it is possible that this is a completely artificial channel, created to aid land drainage. The watercourse is present in 1888 – 1913 map iteration, following largely the same straight course as the contemporary channel.

4.2.25 The Kennett-Lee Brook (River Kennett) flows through a narrow corridor of superficial deposits of Alluvium. Contemporary OS mapping shows the presence of a series of meander cut-offs near to the crossing location, as shown in Plate 4 (Section 4.3.45), and historic mapping from 1898 suggests the previous planform of the Brook included some of these meanders; some of the meander cut-offs are

likely to pre-date historic mapping. The 1930-1957 map, published in 1958 shows a more sinuous planform than current day, with wetland areas throughout the channel corridor reflecting previous flow routes and good floodplain connectivity. It therefore seems that the Kennett-Lee Brook (River Kennett) would have likely been straightened in this area for the construction of the A11 Red Lodge Bypass, built in 1992, to facilitate a more straightforward watercourse crossing by the trunk road.

4.2.26 Lee Brook, which is within the north western fringe of Sunnica West Site A, flows through a band of Alluvium and Peat, overlying bedrock of Chalk in a low gradient, unconfined valley. Historic mapping indicates that the watercourse has followed the same planform since 1885 (Ref. 8), and suggests modification predates this mapping.

4.2.27 Through Sunnica West Site A, Dane Hill watercourse is artificially straight, particularly in the lower reaches (Plate 5, Section 4.3.46), and follows the contours of Dane Hill. Historic mapping is available as far back as 1885 and the watercourse is not shown on this initial OS map (Ref. 8). This suggests that it is possible that this is a completely artificial channel with little/ no morphological or flow variation, created to aid land drainage through historic plantations. The watercourse is present in 1888 – 1913 map iteration, following largely the same straight course as the contemporary channel, aside from the watercourse did previously extend further north-west to connect to drainage channels, but this connection is now unclear due to the presence of the A11.

4.2.28 The River Snail (Soham Lode WFD water body) in the vicinity of Sunnica West Site B is classified by a heavily modified watercourse flowing superficial deposits of Alluvium and River Terrace Deposits, overlying bedrock of Chalk. The width of the alluvial deposits suggest that the natural typology of the watercourse was more sinuous than its contemporary form. Historic mapping is available as far back at 1885 (Ref. 8) and shows the watercourse in its current alignment. Based on historic land use it is likely that the watercourse was modified to service mills in the area.

4.2.29 New River, and the Tributary of New River, flow through a bedrock of Chalk in a low gradient, unconfined valley. The watercourses are heavily modified and are over-wide and artificially straight through the study area (Plate 10, 4.3.54). Historic mapping indicates that the watercourses have followed the same planform since 1885 (Ref. 8), and modification, particularly channel straightening, predates this mapping.

4.2.30 Catch Water Drain, Burwell Lode, and a number of further drainage ditches in the vicinity are considered to be artificial drainage channels and ditches, with limited hydromorphological value. Their uniform character is shown in Plate 11, Section 4.3.55 and Plate 12, Section 4.3.57. Channel modifications pre-date earliest available OS mapping, however it is considered likely that these watercourses are completely artificial, created for the purposes of agricultural land drainage.

Protected Areas

4.2.31 The Order limits is not within Drinking Water Protected areas (surface water) or Drinking Water Safeguard Zones (Surface water or Groundwater). The nearest Drinking Water Protected area (surface water) is approximately 2.1km north east of the Sunnica East Site B boundary near Mildenhall. The nearest Drinking Water Safeguard Zones (Groundwater) is approximately 5km east at Risby.

4.2.32 Numerous groundwater abstractions are located around the margins of the Sites, in particular to the west of Sunnica East Site A associated with a source protection zone (SPZ). The SPZ1 and 2 are outside of the Order limits area except for a small area in the north west of Sunnica West Site A and the Grid Connection Route B to Sunnica West Site B.

4.2.33 Chippenham Fen SSSI, National Nature Reserve (NNR) is part of Fenland Special Area of Conservation (SAC), and is situated directly adjacent to the north of Sunnica West Site B. It is a wetland habitat comprising fen, fen grassland, and basic flush on peat soils as well as calcareous grassland, open grassland, woodland, and open water. Chippenham Fen SSSI is thought to be fed by Chalk groundwater. **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1]** presents further detail of the Chippenham Fen SSSI baseline.

4.2.34 Snailwell Meadows SSSI, connected to River Snail (in unfavourable recovering condition), approximately 50m south of the Sunnica West Site B and 500m south of Grid Connection Route B. This site lies upstream of the Scheme which is separated from it by Fordham Road. Within Sunnica West Site B, the development consists of native grassland and wetland habitat creation, which serves as an ecological buffer between the SSSI and areas of solar PV panels further away. Despite close proximity between the Scheme and this SSSI, the buffer and the SSSI being upstream mean that there will be no adverse impacts on surface water quality. As the solar PV panels are to be constructed on shallow struts, these are unlikely to be of sufficient depth to create preferential flow pathways to groundwater or effect lateral groundwater flows. The structures are anticipated to be above the Chalk aquifer water table at Sunnica West Site A and therefore will not affect groundwater flow.

4.2.35 There are other nature conservation sites in the study area but none are thought to be connected to WFD water bodies and thus are not considered any further by this assessment. **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1.9]** presents further consideration of these sites in relation to potential impacts on the water environment.

4.2.36 In addition to the above, Nitrate Vulnerable Zones are present in each of the WFD water body catchments within this assessment. The Urban Waste Water Treatment Directive also applies to Soham Lode.

4.2.37 Impacts to the above mentioned protected areas have been screened out of this assessment (**Table 2**), as there are no anticipated impacts to groundwater flows or levels as a result of construction of the Scheme or the Scheme itself. Further

detail of this is provided in **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1.9]*.*** In addition, no impacts to water bodies are anticipated from any changes to surface water runoff as a result of the Scheme, with the mitigation proposed for during construction works.

4.3 Baseline Characteristics against WFD Quality Elements

Biological quality elements

4.3.1 Environment Agency survey records are available for fish, macroinvertebrate and macrophyte for the Kennett – Lee Brook (Lee Brook), River Lark 'Downstream of Mill Street Bridge', Sodeham Lode, New River and Burwell Lode from the Environment Agency Ecology and Fish Explorer (Ref. 12). Records were searched within an 8km buffer of the Scheme since 2009; this is a greater buffer than the data presented in **Chapter 8: Ecology and Nature Conservation** of the Environmental Statement **[EN010106/APP/6.1]** which was collected from a 2km buffer of the Scheme. Therefore, a greater level of data is provided within this assessment, which is considered proportionate for this assessment given the chalk streams, protected species, and invasive species located across the study area. Survey sites and their location relative to the Scheme are provided in **Table 12**, and baseline data relevant to the water bodies within this assessment follows. The crossing locations referenced in **Table 12** are shown on Figure 3-23, **Chapter 3: Scheme Description** of the Environmental Statement **[EN010106/APP/6.2.3-23]**.

Table 12 Location of Environment Agency survey sites for fish, macroinvertebrates and macrophytes within 8km of the Sunnica Sites

Site name	Site NGR	Proximity to Non-intrusive and intrusive crossings	Year last surveyed	Group monitored
Kennett – Lee Brook (Lee Brook)	TL 66231 73310	0.45km upstream of the proposed non-intrusive crossings on W1 0.06km upstream of the proposed non-intrusive crossing on W2	2020	Macroinvertebrates
Kennett – Lee Brook (Lee Brook)	TL 66543 71908	1.9km upstream of the proposed non-intrusive crossing on W1 1.5km upstream on proposed non-intrusive works on W2	2018	Fish
River Lark	TL 71346 74314	3.5km upstream of the proposed intrusive crossing on ICR W1	2015	Fish
River Lark	TL 67779 74797	2.9km downstream of the proposed intrusive crossing ICR W1	2014	Macroinvertebrates
River Lark	TL 68900 74300	1.6km downstream of the intrusive crossing on Internal Cable Route (ICR) W1	2014	Macrophytes
Kennett-Lee Brook (River Kennett)	TL 69258 69777	1.1km upstream of the proposed non-intrusive crossing on W3	2018	Macroinvertebrates
Soham Lode	TL 63057 70284	1.5km downstream of the proposed non-intrusive crossing on W4 1.78km downstream of the proposed non-intrusive crossing on W5 1.57km downstream of the proposed non-intrusive crossing on W6 1.39km downstream of the proposed non-intrusive crossing on W7	2021	Macroinvertebrates
Soham Lode	TL 62867 71500	2.9km downstream of the proposed non-intrusive crossing on W4 3.18km downstream of the proposed non-intrusive crossing on W5 3.02km downstream of the proposed non-intrusive crossing on W6 2.79km downstream of the proposed non-intrusive crossing on W7	2014	Fish
New River	TL 56119 70235	7.9km downstream of the proposed non-intrusive crossing on W8 7.7km downstream of the proposed non-intrusive crossing on W9 7.58km downstream of the proposed non-intrusive crossing on W10 7.02km downstream of the proposed non-intrusive crossing on W11	2014	Fish

Site name	Site NGR	Proximity to Non-intrusive and intrusive crossings	Year last surveyed	Group monitored
		7.53km downstream of the proposed non-intrusive crossing on W12 8.03km downstream of the proposed intrusive crossing on W13 8.04km downstream of the proposed intrusive crossing on W14.		
New River	TL 58915 70023	4.8km downstream of the proposed non-intrusive crossing on W8 4.6km downstream of the proposed non-intrusive crossing on W9 4.12km downstream of the proposed non-intrusive crossing on W10 3.9km downstream of the proposed non-intrusive crossing on W11 4.5km downstream of the proposed non-intrusive crossing on W12 5.03km downstream of the proposed intrusive crossing on W13 5.01km downstream of the proposed intrusive crossing on W14	2015	Macro-invertebrates
New River	TL 58915 70023	4.8km downstream of the proposed non-intrusive crossing on W8 4.6km downstream of the proposed non-intrusive crossing on W9 4.12km downstream of the proposed non-intrusive crossing on W10 3.9km downstream of the proposed non-intrusive crossing on W11 4.5km downstream of the proposed non-intrusive crossing on W12 5.03km downstream of the proposed intrusive crossing on W13 5.01km downstream of the proposed intrusive crossing on W14	2015	Macrophytes
Burwell Lode	TL 56429 66619 TL 55649 67865 TL 58414 67837 TL 56494 68987 TL 54352 69542	5.32km downstream of the proposed non-intrusive crossing on W15 4.32km downstream of the proposed non-intrusive crossing on W16 3.23km downstream of the proposed non-intrusive crossing on W17 1.56km downstream of the proposed non-intrusive crossing on W18 1.84km downstream of the proposed non-intrusive crossing on W19 2.22km downstream of the proposed non-intrusive crossing on W20 2.51km downstream of the proposed non-intrusive crossing on W21 4.59km downstream of the proposed non-intrusive crossing on W22 4.32km downstream of the proposed non-intrusive crossing on W23 4.51km downstream of the proposed non-intrusive crossing on W24 5.39km downstream of the proposed non-intrusive crossing on W25	2014	Fish
Burwell Lode	TL 55663 67842 TL 53763 69885	7.34km downstream of the proposed non-intrusive crossing on W15 7.34km downstream of the proposed non-intrusive crossing on W16 7.04km downstream of the proposed non-intrusive crossing on W17 6.73km downstream of the proposed non-intrusive crossing on W18	2015	Macroinvertebrates

Site name	Site NGR	Proximity to Non-intrusive and intrusive crossings	Year last surveyed	Group monitored
		6.82km downstream of the proposed non-intrusive crossing on W19 6.94km downstream of the proposed non-intrusive crossing on W20 7.47km downstream of the proposed non-intrusive crossing on W21 7.51km downstream of the proposed non-intrusive crossing on W22 5.85km downstream of the proposed non-intrusive crossing on W23 5.9km downstream of the proposed non-intrusive crossing on W24 6.6km downstream of the proposed non-intrusive crossing on W25		
Burwell Lode	TL 55663 67842	7.34km downstream of the proposed non-intrusive crossing on W15 7.34km downstream of the proposed non-intrusive crossing on W16 7.04km downstream of the proposed non-intrusive crossing on W17 6.73km downstream of the proposed non-intrusive crossing on W18 6.82km downstream of the proposed non-intrusive crossing on W19 6.94km downstream of the proposed non-intrusive crossing on W20 7.47km downstream of the proposed non-intrusive crossing on W21 7.51km downstream of the proposed non-intrusive crossing on W22 5.85km downstream of the proposed non-intrusive crossing on W23 5.9km downstream of the proposed non-intrusive crossing on W24 6.6km downstream of the proposed non-intrusive crossing on W25	2015	Macrophytes

Composition, abundance and age structure of fish fauna

4.3.2 A survey conducted by the Environment Agency in 2018 for the Kennett – Lee Brook (Lee Brook), recorded Bullhead *Cottus gobio*, Chub *Leuciscus cephalus*, Minnow *Phoxinus phoxinus*, Brook Lamprey *Lampetra planeri*, Pike *Esox lucius* and Dace *Leuciscus leuciscus*.

4.3.3 Two of these species recorded in 2018 are protected species: Brook Lamprey (Ref. 16), Bullhead are present within Kennett-Lee Brook (River Kennett). Brook Lamprey and Bullhead are Annex II species protected under the Habitats Directive.

4.3.4 WFD classification of Fish in 2015 was assessed as Poor status within the Kennett – Lee Brook (Lee Brook). Reasons for not achieving good status include groundwater abstraction, land drainage, barriers – ecological discontinuity and Invasive Non-Native Species (INNS), specifically North American signal crayfish *Pacifastacus leniusculus*.

4.3.5 Multiple surveys in 2015 were conducted by the Environment Agency on the Lark Downstream of Mill Street Bridge WFD water body at Mildenhall (146430) and Wamil Hall (146433). The survey conducted at Mildenhall found: Roach *Rutilus rutilus*, Chub, Common Bream *Abramis brama*, Rudd *Scardinius erythrophthalmus*, Pike, Perch *Perca fluviatilis*, Gudgeon *Gobio gobio*, Dace and *Gasterosteus aculeatus* 3-Spined Stickleback. Whilst at Walmil Hall Chub, Pike, Perch, Dace, Gudgeon, Bullhead, *Phoxinus phoxinus* Minnow, *Cobitis taenia* spined Loach, 3-spined stickleback and *Anguilla anguilla* European Eel were present.

4.3.6 There is no WFD classification provided by the Environment Agency for fish on the Lark Downstream of Mill Street Bridge WFD water body. However, three protected species, namely Spined Loach, Bullhead, and European Eel are present within the water body. Spined Loach and Bullhead are Annex II species protected under the Habitats Directive, whilst European Eel is a Biodiversity Action Plan (BAP) priority species protected under the Section 41 of the Natural Environment and Rural Communities (NERC) act 2006 (Ref. 17).

4.3.7 There is no existing data for fish or WFD classification for fish for Lee Brook.

4.3.8 A survey conducted by the Environment Agency in 2014 at Snailbridge House Fordham, Soham Lode (140508) recorded nine species of fish: European Eel, Brook Lamprey, 3-spined stickleback, Bullhead, Chub, Chub, Dace, Gudgeon, Pike and Stone Loach. Three of these are protected species: Bullhead, Brook Lamprey, and European Eel (4.3.3, 4.3.6).

4.3.9 The latest WFD classification in 2019 provided by the Environment Agency at Soham Lode identified the watercourse as Good for fish species.

4.3.10 There is no existing data for fish or WFD classification for New River.

4.3.11 Multiple fish survey conducted by the Environment Agency in 2014 at five locations at Burwell Lode: Reach, Hallards Fen, Burwell, Cock-up Bridge and Upware (141188) were completed.

4.3.12 Out of the five locations surveyed, Upware was the most diverse containing twelve fish species: Gudgeon, Roach, Perch, Bleak *Alburnus alburnus*, Common Bream, Bitterling *Rhodeus sericeus*, European Eel, Silver Bream *Abramis bjoerkna,* Rudd, Dace, *Gymnocephalus cernuus* Ruffe, Pike and Roach x common bream hybrid. There were other species recorded at alternative sites including: *Tinca tinca* Tench, Spined Loach and 3-spined stickleback.

4.3.13 There is no WFD classification provided by the Environment Agency for fish on Burwell Lode. However, Spined Loach and European Eel, which are protected species (4.3.6) are present.

4.3.14 Environment Agency records of protected fish species within 8km of the Scheme are provided in **Table 13**.

Table 13 Protected fish species recorded at Environment Agency monitoring locations within 8km of the Sunnica Scheme from the Kennett-Lee Brook, River Lark, Sodeham Lode, and Burwell Lode and their respective legislation

Common name	Bern Convention (Appendix)	Habitats Directive (Appendix)	Local Biodiversity Actional Plan	Biodiversity Action Plan (BAP) UK List of Priority Species	The Conservation of Habitats and Species Regulations 2010 (schedule)	Natural Environment and Rural Communities (NERC) Act 2006
European Eel		II	Yes	Yes	II	Section 41 (S41)
Bullhead		II				
European Brook Lamprey	III	II				
Spined Loach		II				
Brown/Sea Trout				Yes		Section 41 (S41)

Composition and abundance of benthic invertebrate fauna

4.3.15 There is no current WFD classification provided by the EA for macroinvertebrates at Kennett-Lee brook (River Kennett). Eleven macroinvertebrate taxa were recorded in 2018 EA surveys at Kennett-Lee Brook (River Kennett). There were records of four macroinvertebrate species in the Kennett-Lee Brook (River Kennett) and Soham Lode (River Snail) that are not Red Data Book (RDB) listed but are regarded as Nationally Scarce. The aquatic beetle *Agabus biguttatus* was recorded in the Kennett-Lee Brook (River Kennett) in 2015, the White-barred Soldier fly *Oxycera morrisii* in the Kennett-Lee Brook (River Kennett) in 2018.

4.3.16 No recent WFD data is available; however, thirty macroinvertebrate taxa were recorded in 2014 by the EA within the Lark downstream of Mill Street Bridgewater body. The Lister's River Snail *Viviparus contectus* is not a RDB listed macroinvertebrate species but is regarded as Nationally Scarce which was recorded in the River Lark in 2014. The non-native but not invasive New Zealand mud snail *Potamopyrgus antipodarum* and *Crangonyx pseudogracilis/floridanus* has been recorded since 2010.

4.3.17 Invertebrates are not currently assessed for the Lee Brook.

4.3.18 Twenty-six macroinvertebrate taxa were recorded in 2021 conducted by the EA within Soham Lode. However, no taxa were classified as notable or protected. The non-native but not invasive New Zealand mud snail *Potamopyrgus antipodarum* and *Crangonyx pseudogracilis/floridanus* has been recorded since 2010.

4.3.19 Invertebrates are currently assessed as Good for Soham Lode. The Caddisfly *Limnephilus nigriceps* was recorded in the Soham Lode in 2012 and is regarded as Nationally Scarce.

4.3.20 Invertebrates are currently assessed as High for New River. No recent WFD data is available, however, the last WFD cycle in 2015 recorded Twenty-six macroinvertebrate taxa were recorded within New River. No taxa were classified as notable or protected. The non-native but not invasive New Zealand mud snail *Potamopyrgus antipodarum* and *Crangonyx pseudogracilis/floridanus* has been recorded since 2010.

4.3.21 Invertebrates are currently assessed as High for Burwell Lode. No recent WFD data is available, however, the last WFD cycle in 2015 recorded thirty macroinvertebrate taxa were within Burwell Lode. No taxa were classified as notable or protected. Two non-native invasive species (INNS) have been recorded: the Caspian Mud Shrimp *Chelicorophium curvispinum* and the Demon Shrimp *Dikerogammarus haemobaphes*. The non-native but not invasive New Zealand mud snail *Potamopyrgus antipodarum* and *Crangonyx pseudogracilis/floridanus* native to Eastern North America has been recorded since 2010.

Composition and abundance of aquatic flora

4.3.22 Macrophytes are currently assessed as Moderate within the Kennett – Lee Brook (Lee Brook). Reasons for not achieving good status include groundwater abstraction, poor soil management, land drainage, and surface water abstraction.

4.3.23 Macrophytes are not currently assessed for the New River WFD water body.

4.3.24 No recent WFD data is available, however, the EA in 2014 recorded thirteen macrophyte species within the Lark Downstream of Mill Street Bridge. No taxa were classified as notable or protected. Two non-native invasive species (INNS) *Lemna minuta* a common species of duckweed and *Elodea nuttallii* Nuttall's Waterweed was present with the River Lark.

4.3.25 There is no existing data for fish or WFD classification for Macrophytes for Lee Brook.

4.3.26 There is no existing data for fish or WFD classification for Macrophytes for Soham Lode.

4.3.27 No recent WFD data is available, however, the last WFD cycle in 2015 recorded seventeen macrophyte species within Burwell Lode (56041). No taxa were classified as notable or protected. One non-native invasive species (INNS) Nuttall's waterweed is present at Burwell Lode.

4.3.28 Macrophytes are currently assessed as Moderate for Burwell Lode. Reasons for not achieving good include poor nutrient and livestock management (agriculture and rural land management), and sewage discharge (continuous).

4.3.29 No notable or protected macrophyte species were recorded within the past ten years for any of the above mentioned water bodies.

Physico-chemical quality elements

4.3.30 Water quality monitoring has been undertaken for the Kennett – Lee Brook (Lee Brook) at Beck Bridge, where Beck Road crosses the Kennett – Lee Brook (Lee Brook), from January 2012 to December 2018. A summary of the data is presented in **Table 14**. The data corresponds with the current and previous Cycle 2 WFD classifications (**Table 4**) which show that oxygenation conditions and water temperature have consistently been classified as High; pH is also High. The data shows nutrient conditions indicated by ammonia and phosphate are also relatively good within the water body; both are currently classified as High.

Table 14 Summary of water quality data: Kennett – Lee Brook (Lee Brook)

Determinand	Units	Min	Max	Average
Alkalinity to pH 4.5 as calcium carbonate ($CaCO_3$)	mg/l	203	274	243
Ammonia un-ionised (as Nitrogen (N))	mg/l	0.00039	0.00095	0.00058
Ammoniacal Nitrogen (as N)	mg/l	0.030	0.045	0.031
Electrical Conductivity (at 25° C)	µS/cm	612	819	762
Nitrate (as N)	mg/l	7	15	10
Nitrite (as N)	mg/l	0.0066	0.0818	0.03125
Nitrogen (Total Oxidised as N)	mg/l	7.3	14.5	10.3
Orthophosphate (reactive as Phosphorus)	mg/l	0.01	0.125	0.059
Dissolved Oxygen	mg/l	8.62	16.7	12.03
Oxygen, Dissolved, % Saturation	%	83.5	170.2	110.3
pH	n/a	7.79	8.39	8.08
Temperature of Water	° C	5.9	17.6	11.15

4.3.31 Water quality monitoring has been undertaken from January 2013 to December 2018 for the Lark Downstream of Mill Street Bridge, approximately 2km downstream of the confluence of River Lark Tributary 1 with the River Lark. This is downstream of Sunnica East Site B, however a summary of the data is provided in **Table 15** for reference. The data corresponds with the current Cycle 2 WFD classification (**Table 5**) which indicates that oxygenation conditions and water temperature are classified as High; pH is also High. In terms of nutrient conditions, a broad range of values was collected for ammonia, but the current classification is High, and the average value is relatively low suggesting the higher recordings do not reflect typical conditions in the water body. Levels of phosphate recorded in the water body are relatively high, and this parameter is currently classified as Moderate. Point source discharge of sewage (continuous) is listed as the reason for not achieving good in this parameter.

Table 15 Summary of water quality data: Lark 'Downstream of Mill Street Bridge' WFD Water Body

Determinand	Units	Min	Max	Average
Alkalinity to pH 4.5 as calcium carbonate ($CaCO_3$)	mg/l	238	279	257
Ammonia un-ionised (as Nitrogen (N))	mg/l	0.00024	0.00216	0.00077
Ammoniacal Nitrogen (as N)	mg/l	0.03	0.171	0.05
Biochemical Oxygen Demand (BOD) (by: 5 Day ATU (Allyl thiourea))	mg/l	1	2.31	1.48
Calcium, dissolved	mg/l	107	138	123
Carbon, Organic (Dissolved as Carbon (DOC))	mg/l	3.24	5.66	3.92
Chemical Oxygen Demand: - (COD)	mg/l	10	23	16
Chloride	mg/l	47	91.7	62.5
Chlorophyll (by acetone extract)	µg/l	1.9	17.1	7.3
Electrical Conductivity (at 25° C)	µS/cm	755	955	848
Copper, Dissolved	µg/l	1.37	1.76	1.52
Iron, Dissolved	µg/l	30	226	53
Magnesium, Dissolved	mg/l	4.08	5.34	4.73
Manganese: Biotic Ligand Model Bioavailable	µg/l	2.14	25.7	8.19
Manganese, Dissolved	µg/l	10	86.9	16.4
Nitrate (as N)	mg/l	6.52	11.2	8.97
Nitrite (as N)	mg/l	0.0158	0.0793	0.0383
Nitrogen (Total Oxidised as N)	mg/l	6.54	11.2	9.01
Orthophosphate (reactive as Phosphorus)	mg/l	0.066	0.31	0.16

Determinand	Units	Min	Max	Average
Dissolved Oxygen	mg/l	5.16	13.9	10.52
Oxygen, Dissolved, % Saturation	%	51.9	136.4	95.7
pH	n/a	7.48	8.31	7.93
Phenolic Odour	n/a	Not found	Not found	Not found
Silica (reactive as Silicon Dioxide (SiO_2))	mg/l	8.06	15.8	12.47
Total Suspended Solids (Suspended at 105° C)	mg/l	3	19.7	6.8
Water Temperature	°C	4.5	18.8	11.1
Visible oil or grease, significant trace	n/a	Not found	Not found	Not found
Zinc	µg/l	5	17	6

4.3.32 Water quality monitoring has been undertaken for the Kennett–Lee Brook just upstream of the A11, from January 2013 to January 2017. A summary of the data is presented in **Table 16**. The data corresponds with the current Cycle 2 WFD classifications (**Table 6**) which state that oxygenation conditions and water temperature are classified as High; pH is also High. In terms of nutrient conditions, the data reflects the High classification of ammonia for the water body. Phosphate levels in the water body are relatively poor, and this parameter is currently classified as Moderate in the Cycle 2 classifications. This is attributed to point source sewage discharge (continuous) to the water body, and poor nutrient management in terms of agriculture and rural land management.

Table 16 Summary of water quality data: Kennett-Lee Brook (River Kennett)

Determinand	Units	Min	Max	Average
Alkalinity to pH 4.5 as calcium carbonate ($CaCO_3$)	mg/l	252	286	264
Ammonia un-ionised (as Nitrogen (N))	mg/l	0.00031	0.00158	0.00058
Ammoniacal Nitrogen (as N)	mg/l	0.03	0.083	0.035
Electrical Conductivity (at 25° C)	µS/cm	653	820	730
Nitrate (as N)	mg/l	6.99	11.8	8.66
Nitrite (as N)	mg/l	0.004	0.0783	0.0217
Nitrogen (Total Oxidised as N)	mg/l	7.01	11.8	8.69
Orthophosphate (reactive as Phosphorus)	mg/l	0.033	0.216	0.108
Dissolved Oxygen	mg/l	9.39	17.5	11.96
Oxygen, Dissolved, % Saturation	%	82.2	165	103.8
pH	n/a	7.76	8.59	8.14
Temperature of Water	° C	4.6	15.6	9.1

4.3.33 No water quality monitoring data is available for Lee Brook, however it is currently classified as Moderate for physico-chemical quality elements (**Table 7**). Oxygenation conditions within the water body are Good, and water temperature and pH are classified as High. However, Lee Brook is currently classified as Poor for phosphate; the reason for not achieving good for this parameter is stated as point source sewage discharge (continuous).

4.3.34 Water quality monitoring has been undertaken for the Soham Lode WFD water body on the River Snail just south / upstream of Sunnica West Site B, from January 2013 to November 2018. A summary of the data is presented in **Table 17**. The data corresponds with the current Cycle 2 WFD classifications (**Table 8**) which state that oxygenation conditions and water temperature are classified as High; pH is also High. In terms of nutrient conditions, ammonia levels are relatively good, and this parameter is also currently classified as High. The recorded data suggests phosphate levels are good within the water body, however it is likely this is a result of the data being slightly dated; previous Cycle 2 WFD classifications show phosphate was previously classified as High, however over time it was downgraded and in 2019 this parameter was classified as Moderate. The reason for not achieving good for this parameter is point source sewage discharge (continuous), it is also noted the monitoring site location was changed.

Table 17 Summary of water quality data: Soham Lode

Determinand	Units	Min	Max	Average
Alkalinity to pH 4.5 as calcium carbonate ($CaCO_3$)	mg/l	191	252	237
Ammonia un-ionised (as Nitrogen (N))	mg/l	0.00012	0.00075	0.00026
Ammoniacal Nitrogen (as N)	mg/l	0.03	0.153	0.04
Biochemical Oxygen Demand (BOD) (by: 5 Day ATU (Allyl thiourea))	mg/l	1	3.26	1.15
Chemical Oxygen Demand: - (COD)	mg/l	10	252	191
Chloride	mg/l	20.6	91.8	27.6
Chlorophyll (by acetone extract)	µg/l	0.54	4.4	1.35
Electrical Conductivity (at 25° C)	µS/cm	555	924	634
Nitrate as N	mg/l	5.72	18.2	7.72
Nitrite as N	mg/l	0.0066	0.101	0.02
Nitrogen (Total Oxidised as N)	mg/l	5.73	18.3	7.74
Orthophosphate (reactive as Phosphorus)	mg/l	0.01	0.826	0.08
Dissolved Oxygen	mg/l	7.29	10.8	8.76
Oxygen, Dissolved, % Saturation	%	66.6	97.5	79.5

Determinand	Units	Min	Max	Average
pH	n/a	7.29	7.76	7.54
Silica (reactive as Silicon Dioxide (SiO_2))	mg/l	14.4	19.4	17.9
Total Suspended Solids (Suspended at 105° C)	mg/l	3	22.2	4.7
Water Temperature	°C	7.7	14.6	11.0

4.3.35 Water quality monitoring has been undertaken for New River just east of Wicken Fen from January 2013 to April 2017. This is a reasonable distance downstream of the Site, approximately 5km, however a summary of the data is presented in **Table 18** for reference. The data corresponds with the current Cycle 2 WFD classifications (

4.3.36 **Table** 9) which state that oxygenation conditions and water temperature are classified as High; pH is also High. In terms of nutrient conditions, ammonia levels within the water body are good, and this parameter is currently classified as High. Phosphate levels recorded in the water body are very good, and this is reflected in the High classification for this parameter.

Table 18 Summary of water quality data: New River

Determinand	Units	Min	Max	Average
Alkalinity to pH 4.5 as calcium carbonate ($CaCO_3$)	mg/l	241	276	262
Ammonia un-ionised (as Nitrogen (N))	mg/l	0.0003	0.0010	0.0005
Ammoniacal Nitrogen (as N)	mg/l	0.03	0.036	0.03
Electrical Conductivity (at 25° C)	µS/cm	753	921	814
Nitrate (as N)	mg/l	6.63	9.64	7.89
Nitrite (as N)	mg/l	0.0066	0.0219	0.0133
Nitrogen (Total Oxidised as N)	mg/l	6.64	9.65	7.91
Orthophosphate (reactive as Phosphorus)	mg/l	0.01	0.023	0.015
Dissolved Oxygen	mg/l	7.87	16.1	11.26
Oxygen, Dissolved, % Saturation	%	67.5	143.3	99.7
pH	n/a	7.76	8.25	8.01
Temperature of Water	° C	3.3	18.6	10.0

4.3.37 Water quality monitoring has been undertaken for the Burwell Lode WFD water body on Catch Water Drain, approximately 350m upstream of the confluence with Burwell Lode, from January 2013 to March 2018. A summary of the data is presented in **Table 19**. The data corresponds with the current Cycle 2 WFD classifications (**Table 10**) which state that oxygenation conditions and water temperature are classified as High; pH is also High. In terms of nutrient conditions, a broad range of values was collected for ammonia, but the current

classification is High, and the average value is relatively low suggesting the higher recordings do not reflect typical conditions in the water body. The data suggests phosphate conditions in the water body are poor, this could be a reflection of the data being slightly dated in comparison to the most recent Cycle 2 classification in 2019; previous classifications for phosphate were Poor, however conditions have improved and it is now classified as High.

Table 19 Summary of water quality data: Burwell Lode

Determinand	Units	Min	Max	Average
2,2,4,4,5,5-Hexabromodiphenyl ether (PBDE 153)	µg/l	0.00006	0.00006	0.00006
2,2,4,4,5,6-Hexabromodiphenyl ether (PBDE 154)	µg/l	0.00006	0.00006	0.00006
2,2,4,4,5-Pentabromodiphenyl ether (PBDE 99)	µg/l	0.00006	0.00025	0.00009
2,2,4,4,6-Pentabromodiphenyl ether (PBDE 100)	µg/l	0.00006	0.00006	0.00006
2,2,4,4-Tetrabromodiphenyl ether (PBDE 47)	µg/l	0.00006	0.00022	0.00009
2,4,4-TriBromoDiphenylEther	µg/l	0.00006	0.00006	0.00006
4-Nonylphenol Branched	µg/l	0.125	0.25	0.134
4-tert-Octylphenol :- {p-tert-Octylphenol}	µg/l	0.05	0.1	0.06
Alkalinity to pH 4.5 as calcium carbonate ($CaCO_3$)	mg/l	203	262	237
Ammonia un-ionised (as Nitrogen (N))	mg/l	0.0004	0.0356	0.0033
Ammoniacal Nitrogen (as N)	mg/l	0.03	1.43	0.1924
Benzo(a)Pyrene	µg/l	0.01	0.01	0.01
Benzo(b)Fluoranthene	µg/l	0.01	0.01	0.01
Benzo(g,h,i)Perylene	µg/l	0.01	0.01	0.01
Benzo(k)Fluoranthene	µg/l	0.01	0.01	0.01
Cadmium, Dissolved	µg/l	0.1	0.1	0.1
Calcium, Dissolved	mg/l	128	154	136
Carbon, Organic (Dissolved as Carbon (DOC))	mg/l	1.57	3.32	2.34
Electrical Conductivity (at 25° C)	µS/cm	294	883	803
Copper, Dissolved	µg/l	1.78	4.16	2.78

Determinand	Units	Min	Max	Average
Di(2-ethylhexyl) phthalate (DEHP)	µg/l	0.2	0.2	0.2
Indeno(1,2,3-cd)pyrene	µg/l	0.01	0.01	0.01
Mercury, Dissolved	µg/l	0.01	2.35	0.08
Nickel, Dissolved	µg/l	1.81	3.16	2.36
Nitrate as N	mg/l	4.78	16	12.16
Nitrite as N	mg/l	0.0194	0.385	0.0676
Nitrogen, Total Oxidised as N	mg/l	4.81	16.1	12.22
Orthophosphate (reactive as Phosphorus)	mg/l	0.01	0.152	0.042
Dissolved Oxygen	mg/l	8.01	15.5	10.79
Oxygen, Dissolved, % Saturation	%	75.4	143.9	99
Perfluorooctanoate anion	µg/l	0.0011	0.0021	0.0015
Perfluorooctylsulphonate anion	µg/l	0.0113	0.0188	0.0163
pH	n/a	7.54	8.31	7.96
Water Temperature	°C	5.1	17.8	11.4
Tributyl Tin as Cation	µg/l	0.0005	0.0005	0.0005
Zinc	µg/l	5	8.51	5.66
Zinc, Dissolved	µg/l	5	5	5

Hydromorphological quality elements

Kennett – Lee Brook (Lee Brook)

4.3.38 In addition to historic straightening of the Kennett – Lee Brook (Lee Brook), the channel has also been modified to be over-wide and over-deep through and in the vicinity of Sunnica East Site A. Lateral connectivity of the watercourse through the Site is generally poor; river bank tops were observed to typically be at least 1m above the water level on a site visit in January 2021 after a relatively wet period of weather, and embankments were present through the Site. Longitudinal continuity of the water body is limited by the gauging weir upstream of Beck Bridge; mapping indicates a sluice is present on the water body just upstream of the confluence with the River Lark.

4.3.39 The water body in general was observed to be very uniform and limited in terms of depth and width variation, which is a result of previous modifications; flow conditions were also very uniform, and the dominant flow type was typically glide flow. In-channel vegetation, mostly reeds, were present across up to half of the channel width suggesting siltation of the bed may be occurring, particularly during lower flows. However, a small number of woody features and a grassy berm were noted within the channel (Plate 1), which act to diversify the channel locally and

provide a greater range of flow conditions. These features provide a good reference for enhancement opportunities for the water body.

Plate 1 Typical nature of the Kennett – Lee Brook (Lee Brook) (left), and example of woody feature in channel (right)

4.3.40 The riparian zone of the Kennett – Lee Brook (Lee Brook) was typically characterised by long lengths of grassy banks, and short reaches of trees which were simple in their complexity and limited to a single layer along the bank tops, and which may have been planted to assist with confining the watercourse to its straightened planform. Due to the relatively high water levels during the site visit, the river bed could not be observed.

River Lark Tributary 1

4.3.41 The River Lark Tributary 1, within the Lark Downstream of Mill Street Bridge WFD water body catchment, is considered to be an ephemeral water body through Sunnica East Site B; the channel supports Ivy, which is a typically terrestrial vegetation, and suggests that the channel is dry for periods of the year. This is supported by the pooled nature of the flow within the channel observed during a site visit in January 2021, which appeared to be the result of rainwater and runoff. The channel was also dry at the time of the second site walkover in October 2021. The flow dynamics of the water body are therefore limited, and it is assumed that it does not receive a consistent flow supply.

4.3.42 The bed of the Lark Tributary 1 channel largely consisted of terrestrial vegetation or fallen leaves, further supporting the assumption the channel is completely artificial, and the channel width and depth was also very uniform in general (Plate 2). The channel was less well defined in some locations, which was associated with pooled water across the floodplain (Plate 2) and therefore an improved lateral connectivity; the immediate land use remained grassy paddocks in this area and no wetland vegetation was observed suggesting the land is not frequently wetted. The riparian zone generally consisted of grassy banks, and limited, non-continuous trees in places along the banks.

Plate 2 Typical nature of the pooled River Lark Tributary 1 (left), and pooled water across the floodplain (right)

Minor tributary at road crossing location

4.3.43 Another minor tributary within the Lark Downstream of Mill Street Bridge WFD water body catchment was observed on a walkover in October 2021. The watercourse will be crossed by the internal access road between E01 and E02, shown in shown on Figure 3-13, **Chapter 3: Scheme Description** of the Environmental Statement **[EN010106/APP/6.2.3-23]**. In terms of hydromorphology, the water body is likely to be artificial and created for land drainage purposes. This is supported by the extremely straight nature of the channel, which also has unnaturally sharp bends, with an over-deep (approximately 2.5m or greater) channel depth. The channel profile was very uniform with no notable bedforms.

4.3.44 Despite relatively low river levels in the area, the water body supported flow at the time of the site survey; this is likely due to the chalk bedrock and relatively shallow groundwater in this area, suggesting groundwater supports the base flow. Likely as a result of this, the water within the channel was clear, and supported floating and submerged aquatic plants in addition to marginal aquatic plants (Plate 3).

Plate 3 Minor Tributary within Lark Downstream of Mill Street Bridge catchment, with extremely straight planform (left) and clear water supporting aquatic plants (right)

Kennett-Lee Brook (River Kennett)

4.3.45 Access to the Kennett-Lee Brook (River Kennett) where it is intersected by Cable Route A was limited at the time of the site visit undertaken in January 2021; the water body was observed near to the A11, west of Red Lodge. Lateral connectivity was limited by structures and hard banking associated to the A11 road, though one of the meander cut-offs, through the wooded area near to the A11 was wet at the time of the visit, and is considered to be a valuable habitat (Plate 4). It is likely that the depth and width variation within the channel is limited by previous straightening of the watercourse, which is likely to limit variation in flow types of the water body. Aerial imagery suggests that aside from localised wooded areas near to the A11, the riparian structure is limited in complexity to a thin layer of semi-continuous trees due to maximisation in land area of the floodplain for farming. This was confirmed during the second site visit in October 2021; around the location of the proposed cable crossing, shown by W3 on Figure 3-23, **Chapter 3: Scheme Description** of the Environmental Statement **[EN010106/APP/6.2.3-23]**, the river appeared relatively deep in comparison to the floodplain and no notable floodplain features were observed.

Plate 4 Kennett-Lee Brook (River Kennett) at the spot location visited (left), and wetted meander cut-off within woodland (right)

Dane Hill Watercourse

4.3.46 Dane Hill watercourse, in and on the boundary of Sunnica West Site A, within the Kennett-Lee Brook (River Kennett) WFD water body catchment, was observed to mostly be pooled with little variation in flow dynamics. Longitudinal connectivity is limited by a track crossing for farming, and culverts towards the A11, and lateral connectivity to the floodplain is poor for a large reach of the watercourse, which has a slight embankment along each bank and is very over-deep (Plate 5). The over-sized channel is also limited in depth variation for a large proportion of the visited length of watercourse, though further upstream (south), a wet woodland area was observed with shallower, better connected channels, although the nature of the vegetation present suggested they were dry for some of the year (Plate 5). The channel bed predominantly consisted of silts, and it is likely that runoff from the field is able to enter the watercourse and supply further fine sediment to the channel given the sloping nature of the field and thin buffer strip on the channel banks. The riparian zone largely consisted of grasses and shrubs, aside from further upstream where simple communities of trees were observed along the banks and through the wet woodland.

Plate 5 Embanked nature of Dane Hill Watercourse towards the A11 (left) and wet woodland further upstream (right)

Lee Brook

4.3.47 Lee Brook, along the northwestern boundary of Sunnica West Site A, was observed to have limited variety in flow dynamics and is characterised by pool flow type. Significant reaches of the channel banks and bed were grassy which suggests that the channel is dry for part of the year, yet it has enough flow to avoid full terrestrial colonisation. The watercourse was observed to be highly modified, with no variety in channel profile and depth, the over-deep nature and trapezoidal channel shape suggest it has been modified for field drainage. Riparian vegetation appeared to be maintained to be present grassy, uniform banks (Plate 6). The riparian zone was also characterised by short, semi-continuous lengths of trees which appeared to be uniform in size suggesting they were planted in associated with the watercourse modification.

Plate 6 Character of Lee Brook

River Snail (Soham Lode)

4.3.48 The River Snail, Soham Lode WFD water body, within Sunnica West Site B supported a gravelly and sandy bed with macrophytes present for a short reach of the visited length of watercourse. However, longer lengths of the channel were observed to have a silty bed. The riparian zone was largely degraded in places where the river banks were affected by cattle poaching (Plate 7), which may be a source of excess fine sediment in the channel. Remaining lengths of banks supported simple communities of semi-continuous trees.

4.3.49 Flow dynamics through the observed length of the River Snail were typically uniform, characterised by pool to glide flow and slow flow velocities, and the watercourse had limited variation in channel width, depth and profile, aside from over-wide areas affected by poaching. It is likely that these current-day characteristics all largely stem from previous modification of the watercourse including straightening, and modification to the channel so that it is over-wide and over-deep. This has produced a channel which is oversized and less connected to the floodplain with limited variation in flow dynamics, which is possibly exacerbated by surface water abstractions locally. Abstraction was observed to

be taking place at the time of the site visit (Plate 7), which in addition to impacting flow dynamics appeared to create turbulence and produce a silty water column and provide pathways for fine sediments and pollutants to enter the watercourse.

Plate 7 Over-wide part of the River Snail affected by poaching (left), and silty nature of watercourse where abstraction was taking place (right)

Minor tributary at road crossing location

4.3.50 A minor tributary within the Soham Lode WFD water body catchment was observed on a walkover in October 2021. The watercourse will be crossed by the internal access road between E01 and E02, shown in shown on Figure 3-13, **Chapter 3: Scheme Description** of the Environmental Statement **[EN010106/APP/6.2.3-23]**. The straight nature of the channel suggests it is an artificial feature, constructed as part of the wider drainage network to drain the land locally. The channel bed was not visible at the time of survey, but the channel appeared to be uniform, with a depth of approximately 1 to 1.5m, with no bedforms or notable morphological features (Plate). The channel is in direct connectivity with the River Snail, through another arm of the drainage channel, and no structures to present a barrier to connectivity were present. There was limited flow in the channel in the upper reaches, though towards the River Snail pools of water were present, likely supplied by backwater from the River Snail.

Plate 8 Nature of minor tributary near to road crossing location within Soham Lode catchment

Minor tributary at intrusive crossing location

4.3.51 Another minor tributary within the Soham Lode WFD water body catchment was observed on a walkover in October 2021. The watercourse will be crossed by intrusive methods by the cable corridor, shown by W7 on Figure 3-23, **Chapter 3: Scheme Description** of the Environmental Statement **[EN010106/APP/6.2.3-23]**. The straight nature of the channel suggests it is an artificial feature, constructed as part of the wider drainage network to drain the land locally. The channel supported a silty bed, with very still, pooled flow (Plate). Filamentous algae was present within the channel, which can be indicative of higher levels of organic material within the watercourse. The channel is approximately 2m wide, but didn't appear to support any bedforms or diversity in flow.

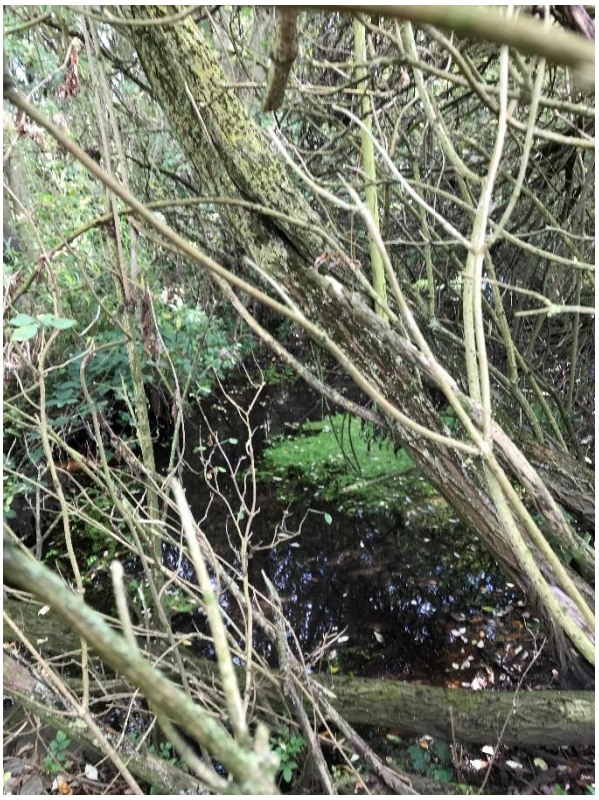


Plate 9 Nature of minor tributary within Soham Lode catchment near to cable crossing location

Unnamed Drain near A412

4.3.52 Cable Route B will also cross an unnamed drain adjacent to the A412, which falls within the New River WFD water body catchment. The drain, which is assumed to be artificial, was observed to have very limited morphological value and is likely dependent on runoff for its flow regime.

New River and Tributary of New River

4.3.53 New River, and the Tributary of New River, which will be considered within the New River WFD water body, were observed to be chalk streams. Both water bodies are crossed by Cable Route B. The water bodies were characterised by uniform flow, ranging from glide to run flow types, with no bedforms such as riffles or pools present. However, the bed substrate for the lengths visited was characterised by clean gravels, macrophytes were also present (but not identifiable due to the timing of the walkover), and the water was generally very clear suggesting clear groundwater supporting the base flow (Plate 10).

4.3.54 New River and the Tributary of New River had slightly limited longitudinal floodplain connectivity due to the presence of some culverts and crossings for field access. The channels also appeared to be extremely modified and over-sized, and in places they were approximately 3 to 4m deep, preventing any lateral connectivity with the floodplain and supporting little variation in channel depth or profile. The riparian zone in places was extremely limited and characterised by grasses and shrubs bordering the field, in other lengths sporadic or semi-

continuous trees were present. In addition, numerous field drains were observed to be discharging into New River during the site walkover.

Plate 10 Character of Tributary of New River (left) and New River (right)

Catch Water Drain

4.3.55 Catch Water Drain, the downstream reach of which falls within the Burwell Lode WFD water body, is considered to be an artificial drainage channel. The water body is crossed by Cable Route B. The flow regime of Catch Water Drain was observed to be very uniform, ranging from pool to glide flow type. The channel bed was not visible due to the silty, turbid flow, and there was limited variety in the channel profile and depth (Plate 11). Sheet piled hard banking was present along a short reach of the watercourse, the remaining riparian zone was limited in places to grassy vegetation, and semi-continuous lengths of trees of simple community complexity. The channel was observed to be very over-deep, as the banks were typically 1m above the water level at the time of the visit, and lateral floodplain connectivity is very limited.

Plate 11 Uniform character of Catch Water Drain (left), and sheet piling along left bank (right)

Burwell Lode

4.3.56 A number of smaller artificial drains, within the Burwell Lode WFD water body catchment, are due to be crossed by Cable Route B. These were not accessible at the time of the site survey. However, they are likely to be limited in terms of hydromorphological variety and value.

4.3.57 Burwell Lode is a highly modified artificial water body; very limited variation in channel profile and depth was observed, and the flow regime was very uniform (Plate 12). The bed of the channel was not visible. The water body has very restricted lateral connectivity, due to grassy embankments which formed the limited riparian zone.

Plate 12 Character of Burwell Lode

Minor tributary near to Burwell National Grid Substation

4.3.58 A minor tributary within the Burwell Lode catchment was observed on the site walkover in October 2021. The tributary falls in the location of Option 1 for the Burwell National Grid Substation extension, shown in shown on Figure 3-13, Chapter 3: Scheme Description of the Environmental Statement [EN010106/APP/6.2.3-23]. The watercourse is considered to be an artificial channel, created for land drainage. Related to this, the channel planform is extremely straight and uniform, no morphological diversity was apparent, and the channel was dry at the time of the survey (Plate 13).

Plate 13 Nature of watercourse at the location of Option 1 for the Burwell National Grid Substation Extension

5 WFD Impact Assessment

5.1 Potential Impacts of the Scheme on WFD Quality Elements

5.1.1 Potential pressures and impacts of the Scheme have been described along with mitigation measures in **Table 20**. Section 5.3 addresses construction impacts of the Scheme, though where construction may potentially have an effect that is not temporary, they are considered in Table 20, Table 22 and Table 23. The proposed mitigation thus forms the basis of this assessment, and the outcomes of the assessment are subject to the appropriate implementation of the mitigation measures provided.

Table 20 Pressures, potential impacts and associated mitigation for proposed works to water bodies scoped into this assessment

Pressure	Sub-pressure	Potential Impacts	Mitigation Measures
Intrusive crossing of water body	Excavation of the channel bed and banks to install cables	Localised but temporary loss of riparian habitat. Temporary impediment to fish passage and ecological connectivity from impact to river continuity. Potential removal of macrophytes and mortality of invertebrates. Temporary and short term adverse impacts to physico-chemical quality elements from potential increase in fine sediment load and organic matter delivered to water body, and chemical spillage risk. Loss of morphological diversity; change in structure of river bed.	Cables will be installed at least 2m below the river bed. Where possible, it is proposed to carry out the works for intrusive crossings in relatively dry weather, wherein it is expected that the smaller water bodies proposed to be crossed by intrusive methods may be expected to be dry. If flow is present within the watercourse, this will be over-pumped, piped or flumed through the works to maintain flow downstream and maintain a dry working area. Extents of excavations per trench will be limited to a maximum width of 3.5m.

Pressure	Sub-pressure	Potential Impacts	Mitigation Measures
		Impacts to physico-chemical quality elements from potential increase in fine sediment load and organic matter delivered to water body from the newly reinstated, bare earth banks.	A CEMP and WMP will be followed which will describe measures which will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing watercourse. This will include storage of excavated material a minimum of 20m away from the watercourse on flat land, or where this is not practicable, and it is to be stockpiled for longer than a two-week period, the material would either be covered with geotextile mats, seeded to promote vegetation growth, or runoff prevented from draining to a watercourse without prior treatment. The WMP will also describe all other pollution prevention measures and proposed water quality monitoring. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** Refer to **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1]**, for further details of construction phase mitigation. A pre-works condition survey will be carried out to inform reinstatement of the channel. Reinstatement will include further enhancements for a longer length of the watercourse than the length disturbed.

Pressure	Sub-pressure	Potential Impacts	Mitigation Measures
			Reinstatement will aim to provide an improved channel form with enhancement works to be carried out (where relevant and appropriate to do so) between 5 and 10 m upstream and downstream of the open trench. It is anticipated that enhancements will consist of soft engineering techniques and improvements to the riparian corridor to improve channel diversity and biodiversity. These measures would be defined post DCO consent. Delivery of enhancements on land not owned by the Applicant will be subject to landowner agreement. Reinstated banks will be covered with biodegradable geotextile/matting and seeded/planted as soon as practicable to reduce risk of bank erosion and fine sediment delivery to water bodies. A WFD Mitigation and Enhancement Strategy (secured by the Framework CEMP) will be prepared that will include measures for the reinstatement of the bed, banks and riparian habitat impacted by each intrusive watercourse crossing technique, and how this ties in upstream and downstream. Reinstatement mitigation works will be limited by the Order limits and width of easements that will apply across the cable route. Channel and riparian enhancements beyond the easement will be considered where appropriate for a distance extending 5-10m upstream and downstream of the extents of the crossing width. However, the delivery of any enhancements on land not owned by the Applicant will be subject to landowner agreement. The Applicant may not have control over this land following completion of the works

Pressure	Sub-pressure	Potential Impacts	Mitigation Measures
Non-intrusive crossing of water body	Excavation of launch and receive pits to facilitate directional drilling beneath watercourse bed.	Impacts to physico-chemical quality elements from potential increase in fine sediment load and organic matter delivered to water body. Impacts to biological and physico-chemical quality elements from spillages of drill fluids or pollutants. Change to lateral connectivity of watercourse following the filling in of pits. Potential impacts from groundwater ingress to excavations.	Launch and receive pits will be located at least 10m from the edge of water/channel for normal flows. Cables will be installed at least 2m below river bed level. The CEMP and WMP will be followed which outlines measures which will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing watercourse. This will include storage of excavated material a minimum of 20m away from the watercourse on flat land, or where this is not practicable, and it is to be stockpiled for longer than a two-week period, the material would either be covered with geotextile mats, seeded to promote vegetation growth, or runoff prevented from draining to a watercourse without prior treatment. The CEMP will be followed which outlines measures to reduce the risk of spillages. Water-based drilling fluids will be used. A specialist contractor will be appointed for all non-intrusive works and will monitor the drilling continuously to avoid any risk of 'break-outs' occurring beneath watercourses. The WMP will describe measures for implementation in the event of a 'break-out' under a watercourse to minimise the risk of pollution. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** Launch and receive pits will be located at least 10m from the edge of water/channel for normal flows to reduce the risk of pathways being created for runoff or pollutants to enter water bodies.

Pressure	Sub-pressure	Potential Impacts	Mitigation Measures
			Pits will be re-instated to previous ground levels to avoid any restriction in lateral connectivity. Following reinstatement of ground levels, the areas will be seeded to reduce the risk of runoff and fine sediments entering the watercourse. Please refer to **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1]**, for further details of construction phase mitigation.
Non-intrusive crossings of the railway and the A11 road.	Excavation of launch and receive pits to facilitate directional drilling for cable crossings. Installation of cables.	Potential impacts from groundwater ingress to excavations. Potential obstruction to groundwater flow.	Sides of excavations will be shored, the nature of which will depend on ground conditions, size, depth and purpose of excavation.
Substation and BESS	Piling for foundations of these infrastructure.	Potential for pollutants to reach groundwater, and potential for turbidity to be generated from auguring.	The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].**

Pressure	Sub-pressure	Potential Impacts	Mitigation Measures
Site access	Two watercourse crossings for access roads required on minor tributaries of the Lark Downstream of Mill Street Bridge and Soham Lode. The crossings are provisionally located at TL 6687 7457 and TL 6380 6854, though finalised locations may be within 50m upstream and downstream of this point; therefore a conservative assessment considering the worst-case impacts has been undertaken. Access tracks will be 3.5m wide, but given there may be side slopes in addition to this, the crossings will be conservatively assessed as 7m. The crossings would have a very local footprint of 0.0013% of the Lark Downstream of Mill Street Bridge water body and 0.0004% of the Soham Lode WFD water body.	Direct loss of riparian habitat. Direct loss of bed and bank habitats. Interruption to floodplain and longitudinal connectivity and associated impacts on biological communities.	The WFD Mitigation and Enhancement Strategy (secured by the Framework CEMP) will consider the two proposed crossings for site access. Mitigation will include the appropriate design of each crossing and enhancement of the channel upstream and downstream on a 'length for length' basis. Compensatory channel enhancement will be delivered to a length equal to the crossing length upstream and downstream of the crossing location. For the crossing within the Lark Downstream of Mill Street Bridge water body, a clear span structure will be designed for the watercourse crossing by the access road, to minimise impacts to the channel bed, banks and watercourse continuity. There may be an option for an alternative access route, to avoid the watercourse or cross at a location further upstream, that will be considered during detailed design. For the crossing within the Soham Lode water body, which is assumed to be a culvert, there may be an option for an alternative crossing design, that will consist of a clear span structure to minimise impacts to the channel bed, banks and watercourse continuity, that will be considered during detailed design. If the crossing is designed as a culvert at detailed design, mitigation measures to minimise the impact of the culvert will include the following. a. The culvert bed level will be set below the existing bed level to allow for the natural excavated bed to be placed over the culvert base; b. The channel gradient will not be disrupted; there will be a

Pressure	Sub-pressure	Potential Impacts	Mitigation Measures
			smooth transition through the channel bed to the culvert bed; and c. Culvert capacity will be designed to ensure flow velocities are not impacted, and the culvert will be oversized to prevent backing up of higher flows.

5.2 Site Specific Assessment of The Proposed Scheme against WFD Quality Elements

5.2.1 The Scheme involves a number of cable crossings of water bodies. A list of the crossings within each WFD water body catchment, their likely location and the nature of the crossing is provided in **Table 21**, these crossings are shown on Figure 3-23, **Chapter 3: Scheme Description** of the Environmental Statement **[EN010106/APP/6.2.3-23]**. Whilst the nature of the watercourse crossing is not anticipated to change, the location of the crossings provided in **Table 21** may occur anywhere within Order limits along the cable route corridors. It is impractical to survey the entire length of all watercourses within this zone. However, the survey data that has been obtained is believed to be representative of each watercourse and sufficient for the prediction of effects. Site specific variances for final crossing locations will be surveyed as part of pre-works surveys and used to inform reinstatement (with enhancement where possible). With regards to watercourse crossings for access roads, only a slight change in location is anticipated and it is assumed that these may vary by 50 m upstream or downstream.

5.2.2 Generally, where intrusive cable crossings of water bodies are proposed, they are proposed for smaller channels, that may be ephemeral or artificial, agricultural field drains. Intrusive crossings are proposed to be carried out in dry weather where possible to minimise potential impacts. **Table 21** also states which aspects of the site-specific impact assessments of the Scheme on the biological, physico-chemical and hydromorphological quality elements are relevant for each water body. Although the cable crossings of water bodies may be classed as a construction activity, they are included within the assessment given they have the potential to impact WFD quality elements and impacts may not be temporary.

5.2.3 The site-specific impacts of the Scheme on the biological, physico-chemical and hydromorphological quality elements of the surface water bodies are provided in **Table 22**. Activities that are not expected to have an adverse effect on WFD quality elements have been omitted.

Table 21 Overview of cable crossings within each WFD water body catchment

WFD water body	Overview of cable crossings (crossing ID). Likely locations shown in Figure 3-23 of the Environmental Statement	WFD operational impact assessment
Kennett – Lee Brook (Lee Brook)	Non-intrusive crossing at TL 66131 73742 (W1) Non-intrusive crossing at TL 66219 73348 (W2)	Provided in **Table 22.** Impacts to this water body are from non-intrusive crossings.
Lark Downstream of Mill Street Bridge	Intrusive crossing of River Lark Tributary 1 at TL 69148 73054 (ICR W1)	Provided in **Table 22**. Impacts to this water body are from an intrusive crossing and a crossing for the access road.
Kennett-Lee Brook (River Kennett)	Non-intrusive crossing at TL 68546 70413 (W3)	Provided in **Table 22**. Impacts to this water body are from non-intrusive crossings.
Lee Brook	No crossings are required for this water body	Not required as no impacts are anticipated.
Soham Lode	Non-intrusive crossing of tributary drain to River Snail at TL 64239 68929 (W4) Non-intrusive crossing of tributary drain to River Snail at TL 63908 69017 (W5) Non-intrusive crossing of the River Snail at TL 63455 68938 (W6) Intrusive crossing of tributary drain to River Snail at TL 63328 69099 (W7)	Provided in **Table 22**. Impacts to this water body are from non-intrusive crossings, an intrusive crossing, and a culvert.
New River	Non-intrusive crossing of drain in New River catchment at TL 62455 69142 (W8) Non-intrusive crossing of drain in New River catchment at TL62158 69043 (W9) Non-intrusive crossing of New River at TL 62158 68802 (W10) Non-intrusive crossing of Tributary of New River at TL 61374 68646 (W11) Non-intrusive crossing of tributary drain to New River at TL 60923 68386 (W12)	Provided in **Table 22**. Impacts to this water body are from non-intrusive crossings and intrusive crossings.

WFD water body	Overview of cable crossings (crossing ID). Likely locations shown in Figure 3-23 of the Environmental Statement	WFD operational impact assessment
	Intrusive crossing of drain in New River catchment at TL 60273 68642 (W13) Intrusive crossing of drain in New River catchment at TL 60252 68652 (W14)	
Burwell Lode	Non-intrusive crossing of drain in Burwell Lode catchment at TL 59165 68849 (W15) Non-intrusive crossing of Catch Water Drain in Burwell Lode catchment at TL 59187 68804 (W16) Non-intrusive crossing of drain in Burwell Lode catchment at TL 58901 68748 (W17) Non-intrusive crossing of drain in Burwell Lode catchment at TL 58753 68508 (W18) Non-intrusive crossing of drain in Burwell Lode catchment at TL 58592 68467 (W19) Non-intrusive crossing of drain in Burwell Lode catchment at TL 58439 68445 (W20) Non-intrusive crossing of drain in Burwell Lode catchment at TL 58351 68229 (W21) Non-intrusive crossing of drain in Burwell Lode catchment at TL 58346 68204 (W22) Non-intrusive crossing of Burwell Lode at TL 58258 67875 (W23) Non-intrusive crossing of drain in Burwell Lode catchment at TL 58114 67602 (W24) Non-intrusive crossing of drain in Burwell Lode catchment at TL 58190 67221 (W25)	Provided in **Table 22**. Impacts to this water body are from non-intrusive crossings.

WFD water body	Overview of cable crossings (crossing ID). Likely locations shown in Figure 3-23 of the Environmental Statement	WFD operational impact assessment
Cam and Ely Ouse Chalk Groundwater Body	Numerous crossings related to water bodies as outlined in this table, in addition to crossings of railways and roads.	Provided in **Table 23.**

Table 22 Operational impacts on the WFD quality elements of the surface water bodies screened into this assessment.

WFD Quality Element	Potential Impact	Mitigation
Biological Quality Elements		
Fish	**Intrusive crossing** Potential for loss of biological continuity resulting in interference with fish population movements and blocking the exchange of individuals among populations, reducing gene flow and disrupting the ability of "source" populations to support declining populations nearby, resulting from temporary blockages in longitudinal connectivity. It is not considered to be a significant impact given the localised, small scale, and temporary nature of the works, and the small nature of the water body at the crossing location that is unlikely to provide preferable habitat for fish. **Non-Intrusive crossing** Possible harm to fish from spillages or pollution from fine sediment, drilling fluids (water based) and chemicals used during construction (e.g. fuel and hydraulic oil). **Watercourse crossings for access roads**	**Intrusive crossing** Where possible, it is proposed to carry out the works for intrusive crossings in relatively dry weather, wherein it is expected that the smaller water bodies proposed to be crossed by intrusive methods may be expected to be dry, and it is unlikely fish will be present. If flow is present within the watercourse, this will be over-pumped which will reduce impact to flow dynamics. Fish surveys and rescues, if required at the time of construction, will be carried out prior to works; this will be detailed in the CEMP. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** **Non-Intrusive crossing** The CEMP and WMP will be followed which outlines measures which will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing watercourse. This will include storage of excavated material a minimum of 20m away from the watercourse on flat land. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].**

WFD Quality Element	Potential Impact	Mitigation
	Culverts can cause a blockage in longitudinal connectivity affecting fish movements, but for open span crossings the impact is minimal. The Soham Lode tributary is not expected to have enough flow year-round to present suitable habitat for most fish. The embedded mitigation of the design of an open span crossing for the tributary within the Lark Downstream of Mill Street Bridge water body will minimise any impacts to fish. It is therefore not expected that the crossings will cause any fragmentation in fish communities or habitats.	The CEMP and WMP will be followed which outlines measures to reduce the risk of spillages. Water-based drilling fluids will be used. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** Launch and receive pits will be located at least 10m away from the watercourse (edge of normal flow) to reduce the risk of pathways being created for runoff or pollutants to enter water bodies. **Watercourse crossings for access roads** Where a culvert is designed, a continuous bed will be maintained throughout the channel to the culvert, and a naturalised bed will be included within the culvert. This mitigation will be secured through the WFD Mitigation and Enhancement Strategy (secured by the Framework CEMP). For the crossing on the Lark Downstream of Mill Street Bridge water body, an open span crossing will be designed to minimise impact on longitudinal connectivity and fish passage. There may be an option for an alternative access route, to avoid the watercourse or cross at a location further upstream, that will be considered during detailed design. For the crossing within the Soham Lode water body, which is assumed to be a culvert, there may be an option for an alternative crossing design, that will consist of a clear span structure to minimise impacts on watercourse continuity, that will be considered during detailed design.
Invertebrates	**Intrusive crossing** Harm or direct mortality to invertebrates through excavation of the channel bed and bank. It is not considered to be a significant impact given the localised, small scale, and temporary nature of the works.	**Intrusive crossing** Extents of excavations will be limited to a maximum of 3.5m. **Non-intrusive crossing**

WFD Quality Element	Potential Impact	Mitigation
	Non-intrusive crossing Possible harm to invertebrates from spillages or pollution from fine sediment, drilling fluids (water based) and chemicals used during construction (e.g. fuel and hydraulic oil). **Watercourse crossings for access roads** Culverts, may cause mortality of invertebrates during construction or limit movement longitudinally through the watercourse following construction, but minimal impact is anticipated from the open span crossing on the tributary within the Lark Downstream of Mill Street Bridge water body. The crossings will respectively cover a footprint of 0.00013% and 0.0004% of the Lark Downstream of Mill Street Bridge and Soham Lode water bodies. These measurements relate to the length of WFD designated watercourse therefore the total channel length within the entire WFD water body catchment would be much higher. Therefore, given the mitigation proposed, impacts would not be significant at the water body scale.	The CEMP and WMP will be followed which outlines measures which will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing watercourse. This will include storage of excavated material a minimum of 20m away from the watercourse on flat land, other measures will be applied if this is not practicable. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** The CEMP and WMP will be followed which outlines measures to reduce the risk of spillages. Water-based drilling fluids will be used (See Framework CEMP in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].**. Launch and receive pits will be located at least 10m from the edge of the watercourse based on normal flow extents to reduce the risk of pathways being created for runoff or pollutants to enter water bodies. **Watercourse crossings for access roads** A continuous bed will be maintained throughout the channel to the culvert, and a naturalised bed will be included within the culvert which should improve conditions for invertebrate movements. The open span crossing will allow the existing bed to remain. This mitigation will be secured through the WFD Mitigation and Enhancement Strategy (secured by the Framework CEMP). For the crossing on the Lark Downstream of Mill Street Bridge water body, an open span crossing will be designed to minimise impact on longitudinal connectivity and fish passage. There may be an option for an alternative access route, to avoid the watercourse or cross at a location further upstream, that will be considered during detailed design.

WFD Quality Element	Potential Impact	Mitigation
		For the crossing within the Soham Lode water body, which is assumed to be a culvert, there may be an option for an alternative crossing design, that will consist of a clear span structure to minimise impacts on watercourse continuity, that will be considered during detailed design.
Macrophytes and phytobenthos combined	**Intrusive crossing** Possible removal of macrophytes and phytobenthos from excavation of the channel bed and bank. It is not considered to be a significant impact given the localised, small scale, and temporary nature of the works and the ephemeral or artificial nature of the water bodies subject to this activity. **Non-intrusive crossing** Possible smothering of macrophytes and phytobenthos from excessive fine sediment on construction runoff or drilling fluids or toxic effects from chemical pollutants that may be spilt on Site. **Watercourse crossings for access roads** Installation of the crossings may cause removal of macrophytes and phytobenthos, and shading may prevent macrophyte growth. Given the small footprint of the crossing lengths relative to water body length this impact is not significant at the water body scale.	**Intrusive crossing** The extent of excavations will be limited to a maximum of 3.5m longitudinally through the channel. The length and depth will be determined at each location depending on the channel form, with the cables to be located beneath the channel bed. **Non-intrusive crossing** The CEMP and WMP will be followed which outlines measures to reduce the risk of spillages. Water-based drilling fluids will be used. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** Launch and receive pits will be located at least 10m from the edge of the watercourse based on normal flow extents to reduce the risk of pathways being created for runoff or pollutants to enter water bodies. **Watercourse crossings for access roads** Enhancements will be delivered to water bodies elsewhere throughout the Site and to a length equal to the crossing length upstream and downstream of the crossing location. This mitigation will be secured through the WFD Mitigation and Enhancement Strategy secured through the Framework CEMP. For the crossing on the Lark Downstream of Mill Street Bridge water body, there may be an option for an alternative access route, to avoid the watercourse or cross at a location further upstream, that will be considered during detailed design.

WFD Quality Element	Potential Impact	Mitigation
		For the crossing within the Soham Lode water body, which is assumed to be a culvert, there may be an option for an alternative crossing design, that will consist of a clear span structure to minimise impacts to the channel banks and habitats, that will be considered during detailed design.
Physico-chemical Quality Elements		
Thermal Conditions	**Intrusive crossing** No anticipated impacts **Non-intrusive crossing** No anticipated impacts. **Watercourse crossings for access roads** No anticipated impacts.	**Intrusive crossing** No mitigation required. **Non-intrusive crossing** No mitigation required. **Watercourse crossings for access roads** No mitigation required.
Oxygenation conditions	**Intrusive crossing** Possible increase in fine sediment and organic material delivered to water body from excavation activities. **Non-intrusive crossing** Possible reduction in levels of dissolved oxygen from excavation activities for launch and receive pits, which may create a source and pathway for the delivery of fine sediments and organic material to the water body. **Watercourse crossings for access roads** No anticipated impacts.	**Intrusive crossing** Where possible, it is proposed to carry out the works for intrusive crossings in relatively dry weather, wherein it is expected that the smaller water bodies proposed to be crossed by intrusive methods may be expected to be dry. If flow is present within the watercourse, this will be over-pumped which will reduce impact to flow dynamics. Reinstated banks will be covered with biodegradable matting and seeded as soon as practicable to reduce risk of bank erosion and delivery of fine sediment and organic material to water bodies. **Non-intrusive crossing** The CEMP will be followed which outlines measures which will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing watercourse. This will include storage of excavated material a minimum of 20m away from the watercourse on flat land, other measures will be applied if this is not practicable. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].**

WFD Quality Element	Potential Impact	Mitigation
		Launch and receive pits will be located at least 10m from the edge of the watercourse based on normal flow extents to reduce the risk of pathways being created for runoff or pollutants to enter water bodies. **Watercourse crossings for access roads** No mitigation required.
Nutrient Conditions	**Intrusive crossing** Possible increase in fine sediment and nutrients delivered to water body from excavation activities. At crossings W13 and W14 of the drains within the New River catchment, shown on Figure 3-2, **Chapter 3: Scheme Description** of the Environmental Statement **[EN010106/APP/6.3]**., this water body was observed to be dry during a site visit in January 2019 and in October 2021 therefore it is assumed the water body is ephemeral with a limited pathway connectivity to New River. Therefore, potential impacts to New River from crossings W13 and W14 are minimal. **Non-intrusive crossing** Possible increase in nutrient levels from excavation activities for launch and receive pits, which may create a source and pathway for delivery of nutrients to the water body. **Watercourse crossings for access roads** No anticipated impacts.	**Intrusive crossing** Where possible, it is proposed to carry out the works for intrusive crossings in relatively dry weather, wherein it is expected that the smaller water bodies proposed to be crossed by intrusive methods may be expected to be dry. If flow is present within the watercourse, this will be over-pumped which will reduce impact to flow dynamics. Reinstated banks will be covered with biodegradable matting and seeded as soon as practicable to reduce risk of bank erosion and delivery of fine sediment and organic material to water bodies, and prevention of pathways for agricultural runoff to enter the water body. This mitigation will be secured through the Framework CEMP. **Non-intrusive crossing** The CEMP and WMP will be followed which outlines measures which will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing watercourse. This will include storage of excavated material a minimum of 20m away from the watercourse on flat land, other measures will be applied if this is not practicable. Launch and receive pits will be located at least 10m from the edge of the watercourse based on normal flow extents to reduce the risk of pathways being created for runoff or pollutants to enter water bodies.

WFD Quality Element	Potential Impact	Mitigation
		A temporary drainage system will be implemented to ensure that construction site runoff is carefully managed and excess fine sediments, that may be a vector for nutrients, are removed prior to any water being discharged to a watercourse. A Water Activity Permit from the Environment Agency may be required. **Watercourse crossings for access roads** No mitigation required.
Hydromorphological Quality Elements		
River Continuity	**Intrusive crossing** Temporary obstruction to river continuity whilst excavation takes place. This is not considered to present a significant impact given the temporary nature and small scale of the barrier and the ephemeral or artificial nature of the water bodies subject to this activity. **Non-Intrusive crossing** No anticipated impact **Watercourse crossings for access roads** The structures can present a localised interruption to continuity. Given the proposed mitigation, and existing fragmented continuity of the baseline conditions at the locations of the proposed culvert, and the open span crossing for the tributary within the Lark Downstream of Mill Street Bridge water body, this impact is not significant at the water body scale.	**Intrusive crossing** Where possible, it is proposed to carry out the works for intrusive crossings in relatively dry weather, wherein it is expected that the smaller water bodies proposed to be crossed by intrusive methods may be expected to be dry. If flow is present within the watercourse, this will be over-pumped which will reduce impact to flow dynamics. This mitigation will be secured through the Framework CEMP. **Non-intrusive crossing** No mitigation required. **Watercourse crossings for access roads** A continuous bed will be maintained throughout the channel to the culvert, and a naturalised bed will be included within the culvert to maintain bed continuity. For the open span crossing the existing bed will be retained. Crossings will be appropriately sized so that flood flows are not impounded. Compensatory channel enhancement will be delivered to a length equal to the culvert length upstream and downstream of the crossing location. This will be outlined through the WFD Mitigation and Enhancement Strategy, secured through the Framework CEMP.
River Depth and Width Variation	**Intrusive crossing**	**Intrusive crossing**

WFD Quality Element	Potential Impact	Mitigation
	Possible changes to channel profile upon reinstatement of the channel. This is not expected to present a significant impact given the existing modified nature of the water bodies subject to this activity. **Non-Intrusive crossing** No anticipated impact. **Watercourse crossings for access roads** Culverts, and to an extent open span crossings, will present a uniform, unchangeable section of channel. Given the small nature of the culvert footprint compared to the water body length, this is not anticipated to be significant at the water body scale.	The WFD Mitigation and Enhancement Strategy (secured by the Framework CEMP) will specify that a pre-works condition survey will be carried out to inform reinstatement of the channel and avoid negative impacts to this quality element. Reinstatement, as outlined in Table 20, will include further enhancements for a longer length of the watercourse than the length disturbed. Reinstatement mitigation works will be limited by the Order limits and width of easements that will apply across the cable route. Channel and riparian enhancements beyond the easement will be considered where appropriate for a distance extending 5-10m upstream and downstream of the extents of the crossing width. However, the delivery of any enhancements on land not owned by the Applicant will be subject to landowner agreement. The Applicant may not have control over this land following completion of the works. **Non-intrusive crossing** No mitigation required **Watercourse crossings for access roads** The WFD Mitigation and Enhancement Strategy (secured through the Framework CEMP) will specify that compensatory channel enhancement will be delivered to a length equal to the crossing length upstream and downstream of the crossing location.
Structure and Substrate of the River Bed	**Intrusive crossing** Possible changes to bed substrate upon reinstatement of the channel. **Non-Intrusive crossing** No anticipated impact. **Watercourse crossings for access roads**	**Intrusive crossing** Bed material, including any gravels and cobbles will be retained on site for reinstatement to the watercourse. Material will be cleaned of fine sediment where appropriate prior to reinstatement. The reinstatement of the channel, as outlined in Table 20, will include further enhancements for a longer length of the watercourse which may involve improvements to this quality element; this will be secured through the WFD Mitigation and Enhancement Strategy, secured through the Framework CEMP.

WFD Quality Element	Potential Impact	Mitigation
	Culverts can present an interruption to the natural bed substrate. The open span crossing will not affect this element. Given the mitigation proposed, this impact will not be significant at the water body scale.	**Non-intrusive crossing** No mitigation required. **Watercourse crossings for access roads** The WFD Mitigation and Enhancement Strategy (secured through the Framework CEMP) will detail design principals for the culvert: a natural bed will be reinstated through the culvert, and the culvert will not present an interruption to the channel gradient so there will be no abrupt transitions in the bed between open channel and structure.
Structure of the Riparian Zone	**Intrusive crossing** Loss of riparian habitat at the location of the excavation for the cable crossing. It is not considered to be a significant impact given the small scale of the works, any impacts will not be permanent given vegetation will be reinstated. **Non-intrusive crossing** Loss of riparian habitat at the location of the launch and receive pits. **Watercourse crossings for site access** Crossings would present a local removal and disconnection of the channel from the riparian zone. Given the enhancements provided elsewhere and to the water bodies where the crossings are located, and limited nature of the riparian zone at the crossing locations this impact will not be significant at the water body scale.	**Intrusive crossing** Secured through the WFD Mitigation and Enhancement Strategy (secured through the Framework CEMP), the channel will be re-instated to baseline conditions, with enhancements, as outlined in Table 20, which will include the reinstatement of riparian vegetation and opportunities to increase geomorphic diversity and biodiversity. **Non-intrusive crossing** Prescribed through the CEMP (a Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2])**, pits will be located at least 10m away from the edge of the watercourse based on normal flow extents, at this distance the vegetation assemblage will likely be a factor of the agricultural land use rather than riparian habitat. Pits will be kept minimal through use of specialised machinery; likely dimensions of the pits near water bodies would be a maximum of 8m by 4m and 2m deep. **Watercourse crossings for access roads** The WFD Mitigation and Enhancement Strategy (secured through the Framework CEMP) will specify that compensatory channel enhancement will be delivered to a length equal to the crossing length upstream and downstream of the crossing location.

5.2.4 The site-specific impacts of the Scheme on the WFD quality elements of the groundwater body are provided in **Table 23**.

Table 23 Operational impacts on the WFD quality elements on the Cam and Ely Ouse Chalk (GB40501G400500) groundwater body. Activities that are not expected to have an adverse impact on each quality element receptor are omitted

WFD Quality Element	Potential Impact	Mitigation
Quantitative Status Elements		
Quantitative Saline Intrusion	**Non-intrusive crossings** No anticipated impact.	**Non-intrusive crossings** No mitigation required.
Quantitative Water Balance	**Non-intrusive crossings** Potential groundwater ingress to excavations for installation of cable crossing. Non-intrusive crossing sites around Burwell and the northern sites at Sunnica East Site A may experience temporary groundwater ingress during excavation of send and receiving pits. These sites are underlain by alluvium, which considering their permeability and very low water table gradient, the flow rates would be low if they were to enter the excavation. Overall, the risk of impacts are low, localised and will be temporary at each location, and are therefore not considered to be significant at the water body scale. Please refer to **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1.9]**, for further details.	**Non-intrusive crossings** Excavations for watercourse crossings and programmed so that works are completed in the most efficient and timely manner possible. This will be detailed in the CEMP (a Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2])**. Installation of the cables will be short term, temporary, transient and phased. Sides of excavations will be shored, the nature of which will depend on ground conditions, size, depth and purpose of excavation, which will further minimise groundwater ingress.
Quantitative GWDTEs test	**Non-intrusive crossings** Chippenham Fen is considered to be fed by chalk groundwater. There is no anticipated impact to the hydrology of Chippenham Fen given any ingress to excavations is anticipated to be minimal and / at a slow rate, and not likely to cause an impact at the water body scale. No groundwater ingress is predicted in sites upgradient of Chippenham Fen. **Installation of cables for rail and A11 crossing**	**Non-intrusive crossings** Excavations for watercourse crossings and programmed so that works are completed in the most efficient and timely manner possible. Installation of the cables will be short term, temporary, transient and phased.

WFD Quality Element	Potential Impact	Mitigation
	The cable duct will be installed to approximately 10m depth for the rail crossing and is intended to be 10m depth for the A11 crossing, but potentially up to a maximum of 20m depth. The cables are anticipated to be below the water table and may form a potential obstruction within the Chalk aquifer, however the thickness of the cables, with a profile thickness of 440mm, is small compared to the aquifer thickness. In addition, the aquifer is considered to be sufficiently permeable, it is not expected that groundwater flow will be impeded around the ducts. Deeper cable ducts to the maximum design depth are not expected to increase the risk of impeding groundwater flow, as at greater depth the quantity of groundwater flow is typically less than in the shallower chalk. Therefore, no impacts to groundwater flow at the groundwater body scale, or to the hydrology of Chippenham Fen are anticipated. Please refer to **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1.9]**, for further details.	Sides of excavations will be shored, the nature of which will depend on ground conditions, size, depth and purpose of excavation, which will further minimise groundwater ingress. These measures will be secured through the CEMP A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2]**).
Quantitative Dependent Surface Water Body Status	**Non-intrusive crossings** There is no anticipated impact to surface water bodies given any groundwater ingress to excavations is anticipated to be minimal and / or at a slow rate, and not likely to cause an impact at the water body scale. If required, water could be returned to the watercourse following treatment to maintain flows. **Installation of cables for rail and A11 crossing**	**Non-intrusive crossings** Excavations for watercourse crossings and programmed so that works are completed in the most efficient and timely manner possible. Installation of the cables will be short term, temporary, transient and phased. Sides of excavations will be shored, the nature of which will depend on ground conditions, size, depth and purpose of excavation, which will further minimise groundwater ingress. These measures will be secured through the CEMP. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2]**).

WFD Quality Element	Potential Impact	Mitigation
	The cable duct will be installed to approximately 10m depth for the rail crossing and is intended to be 10m depth for the A11 crossing, but potentially up to a maximum of 20m depth. The cables are anticipated to be below the water table and may form a potential obstruction within the Chalk aquifer, however the thickness of the cables, with a profile thickness of 440mm, is small compared to the aquifer thickness. In addition, the aquifer is considered to be sufficiently permeable, it is not expected that groundwater flow will be impeded around the ducts. Deeper cable ducts to the maximum design depth are not expected to increase the risk of impeding groundwater flow, as at greater depth the quantity of groundwater flow is typically less than in the shallower chalk. Therefore, no impacts to groundwater flow at the groundwater body scale, or to the baseflow of surface water bodies are anticipated.	
Chemical Status Elements		
Chemical Drinking Water Protected Area	**Non-intrusive crossings** Excavations for installation of cable crossings may introduce pollutants to groundwater from equipment leaks/spills. Sites around Burwell and Sunnica East Site A may encounter groundwater in excavations. Overall, the risk of impacts are low, localised and will be temporary at each location, and are therefore not considered to be significant at the water body scale. In addition, the nearest Drinking Water Protected Area, Cut-off Channel (GB205033000040) is Currently Not at Risk (Ref 5), and the Scheme is not anticipated to impact this status. **Piling for foundations of BESS and substations** Potential for spills of construction materials or pollutants to reach groundwater.	**Non-intrusive crossings** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** Installation of the cables will be short term, temporary, transient and phased. The Framework CEMP will include measures specifying that sides of excavations will be shored, the nature of which will depend on ground conditions, size, depth and purpose of excavation, which will minimise groundwater ingress. Groundwater will be removed and treated prior to discharge to ground or a watercourse (if suitable to do so and a permit is obtained from the Environment Agency of required) or removed from the site by tanker for disposal at a licenced waste facility.

WFD Quality Element	Potential Impact	Mitigation
	Overall, the risk of impacts are low, localised and will be temporary at each location, and are therefore not considered to be significant at the water body scale. In addition, the nearest Drinking Water Protected Area, Cut-off Channel (GB205033000040) is Currently Not at Risk (Ref 5), and the Scheme is not anticipated to impact this status. **Installation of cables for rail and A11 crossing** Cables are anticipated to be installed below the water table. Potential for spills of construction materials or pollutants to reach groundwater, and potential for turbidity to be generated from installation. Overall, the risk of impacts are low, localised and will be temporary at each location, and are therefore not considered to be significant at the water body scale. In addition, the nearest Drinking Water Protected Area, Cut-off Channel (GB205033000040) is Currently Not at Risk (Ref 5), and the Scheme is not anticipated to impact this status.	**Piling for foundations of BESS and substations** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** **Installation of cables for rail and A11 crossing** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].**
General Chemical test	**Non-intrusive crossings** Excavations for installation of cable crossings may introduce pollutants to groundwater from equipment leaks/spills. Sites around Burwell and Sunnica East Site A may encounter groundwater in excavations. Overall, the risk of impacts are low, localised and will be temporary at each location, and are therefore not considered to be significant at the water body scale. **Piling for foundations of BESS and substations** Potential for spills of construction materials or pollutants to reach groundwater, and potential for turbidity to be generated from auguring. Overall, the risk of impacts are low, localised and will be temporary at each location, and are therefore not considered to be significant at the water body scale.	**Non-intrusive crossings** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** Installation of the cables will be transient and phased. Sides of excavations will be shored, the nature of which will depend on ground conditions, size, depth and purpose of excavation, which will minimise groundwater ingress. Groundwater will be removed and treated. **Piling for foundations of BESS and substations**

WFD Quality Element	Potential Impact	Mitigation
	Installation of cables for rail and A11 crossing Cables are anticipated to be installed below the water table. Potential for spills of construction materials or pollutants to reach groundwater, and potential for turbidity to be generated from installation. Risk of impacts are low, localised and will be temporary, and are not likely to cause an impact to surface water bodies considering dilution in the aquifer.	The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** **Installation of cables for rail and A11 crossing** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].**
Chemical GWDTEs test	**Non-intrusive crossings** No impact anticipated. Sites upgradient of Chippenham Fen are not expected to encounter groundwater. **Piling for foundations of BESS and substations** Potential for spills of construction materials or pollutants to reach groundwater, and potential for turbidity to be generated from auguring. Overall, the risk of impacts are low, localised and will be temporary at each location, and are therefore not considered to be significant at the water body scale. **Installation of cables for rail and A11 crossing** Cables are anticipated to be installed below the water table. Potential for spills of construction materials or pollutants to reach groundwater, and potential for turbidity to be generated from installation. Risk of impacts are low, localised and will be temporary, and are not likely to cause an impact to surface water bodies considering dilution in the aquifer.	**Non-intrusive crossings** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** **Piling for foundations of BESS and substations** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** **Installation of cables for rail and A11 crossing** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].**

WFD Quality Element	Potential Impact	Mitigation
Chemical Dependent Surface Water Body Status	**Non-intrusive crossings** There is no anticipated impact to surface water bodies given any groundwater ingress to excavations is anticipated to be minimal and CEMP and WMP in operation to minimise risk of pollution, and any affected groundwater not likely to cause an impact to stream baseflow at the water body scale. **Piling for foundations of BESS and substations** Potential for spills of construction materials or pollutants to reach groundwater, and potential for turbidity to be generated from auguring. Risk of impacts are low, localised and will be temporary, and are not likely to cause an impact to surface water bodies considering dilution in the aquifer. **Installation of cables for rail and A11 crossing** Cables are anticipated to be installed below the water table. Potential for spills of construction materials or pollutants to reach groundwater, and potential for turbidity to be generated from installation. Risk of impacts are low, localised and will be temporary, and are not likely to cause an impact to surface water bodies considering dilution in the aquifer.	**Non-intrusive crossings** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** **Piling for foundations of BESS and substations** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].** **Installation of cables for rail and A11 crossing** The CEMP and WMP will be followed which outlines measures which will be taken to prevent leaks and spills and clean up procedures in case of leaks/spills. A Framework CEMP is provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2].**
Chemical Saline Intrusion	**Non-intrusive crossings** No anticipated impact. **Piling for foundations of BESS and substations** No anticipated impact.	**Non-intrusive crossings** No mitigation required. **Piling for foundations of BESS and substations** No anticipated impact.

5.3 Construction impacts

Potential construction phase risks

5.3.1 In addition to construction impacts specific to the Scheme assessed in **Table 22** and **Table 23**, there are a number of more general adverse impacts which may occur from construction activity, including:

a. Impacts on surface water quality due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals, or through mobilisation of contamination following disturbance of contaminated ground or groundwater, or through uncontrolled site run-off;

b. Potential changes in on-site flow pathways, affecting the rate and flow of surface water runoff through the construction site, which could mobilise pollutants into water bodies;

c. Construction activities such as earth works, excavations, site preparation, levelling and grading operations result in the disturbance of soils. Exposed soil is more vulnerable to erosion during rainfall events due to loosening and removal of vegetation to bind it, compaction and increased runoff rates. Surface runoff from such areas can contain excessive quantities of fine sediment, which may eventually be transported to watercourses where it can result in adverse impacts on water quality, flora and fauna. Construction works within, along the banks and across watercourses can also be a direct source of fine sediment mobilisation;

d. Contamination of surface waters, groundwater and soil could result from leakage and spills of fuels, oils, chemicals and concrete during construction affecting watercourses indirectly via site runoff or directly where works are close to and within a water body. Contamination may reduce water quality and impact aquatic fauna and flora; and

e. Any construction works that impede on the floodplain have the potential to increase rate and volume of runoff and increase risk of blockages in watercourses that could lead to flow being impeded, and a potential rise in flood risk. Earthworks may also alter flow pathways and the compaction of the ground and vegetation clearance will also increase the rate and volume of runoff.

Construction Mitigation

5.3.2 The construction will take place under a CEMP. The CEMP details the measures that would be undertaken during construction to mitigate the temporary effects on the water environment. A Framework CEMP (refer to **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2]**) has been developed will be finalised in advance of construction works following receipt of the DCO consent.

5.3.3 The CEMP will comprise good practice methods that are established and effective measures to which the development will be committed through the development consent. The measures within the document will focus on managing the risk of pollution to surface waters and the groundwater environment. It will also consider the management of activities within floodplain areas (i.e. kept to a minimum and with temporary land take required for construction to be located out of the floodplain as far as reasonably practicable).

5.3.4 The CEMP will be standard procedure for the Scheme and will describe the principles for the protection of the water environment during construction. The CEMP will be supported by a WMP that will provide greater detail regarding the

mitigation to be implemented to protect the water environment from adverse effects during construction.

5.3.5 Good Practice Guidance is summarised in **Chapter 9: Flood Risk, Drainage and Water Resources** of the Environmental Statement **[EN010106/APP/6.1]**, which includes information on:

a. Permissions and Consents;
b. Management of Construction Site Runoff;
c. Management of Construction Site Spillage Risk; and
d. Management of Flood Risks.

5.3.6 It is anticipated that all WFD construction risks could be adequately mitigated with appropriate planning and management.

5.4 Assessment of the Scheme against WFD Objectives

Assessment Against Water Body Mitigation Measures

5.4.1 The EA identifies mitigation measures for water bodies, which are actions that can be implemented to protect and improve the water environment and help achieve the objectives for each RBMP. This section of the assessment considers the nature of the measures identified by the EA for each water body and assesses whether the Scheme may prevent such measures being implemented.

5.4.2 There are currently no mitigation measures identified by the Environment Agency as applicable for the Kennett – Lee Brook (Lee Brook), which have not yet been implemented. In addition to this, within the Sunnica East Site A, land over the left bank floodplain of the Kennett – Lee Brook (Lee Brook) has been designated for ecological mitigation. Therefore, it is considered that the Scheme will not prevent the Environment Agency's WFD mitigation measures for Kennett – Lee Brook (Lee Brook) being carried out.

5.4.3 A number of Environment Agency mitigation measures for the Lark 'Downstream of Mill Street Bridge' WFD water body have been identified. These are presented in **Table 24** alongside an appraisal of whether the Scheme may prevent the measures being achieved.

Table 24 Environment Agency Mitigation measures identified for the Lark Downstream of Mill Street Bridge

WFD mitigation measure	Appraisal of the Scheme
Removal of obsolete structure	No obsolete structures were observed on the River Lark Tributary 1 or the tributary to be crossed by the access road, therefore this measure is not applicable to the River Lark Tributary 1 and therefore the Scheme will not impact the implementation of this measure.

WFD mitigation measure	Appraisal of the Scheme
Alter culvert channel bed	No activities associated to the Scheme are anticipated to prevent implementation of this measure.
Set back embankments	This measure is not applicable to the River Lark Tributary 1 or the tributary to be crossed by the access road as no set back embankments were observed. Therefore, the Scheme will not impact the implementation of this measure.
Enhance ecology	An area of land within the Site local to the River Lark Tributary 1 has been designated for ecological mitigation, therefore it is likely the Scheme will help facilitate implementation of this measure.
Changes to locks etc	This measure is not applicable to the River Lark Tributary 1 or the tributary to be crossed by the access road and therefore the Scheme will not impact the implementation of this measure.
Vegetation control	No activities associated to the Scheme are anticipated to prevent implementation of this measure.
Invasive species techniques	No activities associated to the Scheme are anticipated to prevent implementation of this measure.
Retain habitats	No activities associated to the Scheme are anticipated to prevent implementation of this measure; all infrastructure will be located at least 10m from water bodies. Where intrusive crossings will be undertaken riparian vegetation will be reinstated. The open span crossing for the access road will minimise disruption to habitats compared to more intrusive designs.
Sediment management strategy	No activities associated to the Scheme are anticipated to prevent implementation of this measure; all infrastructure will be located at least 10m from water bodies. Potentially, in fields where livestock are present and poaching of river banks occurs, or crop fields that are ploughed/tilled/left fallow, the Scheme may locally reduce erosion of fine sediment into watercourses.
Maintenance- prevent sediment transfer	It is likely this measure is not applicable to the River Lark Tributary 1 and therefore the Scheme will not impact the implementation of this measure.
Water level management	It is likely this measure is not applicable to the River Lark Tributary 1 or the tributary to be crossed by the access road and therefore the Scheme will not impact the implementation of this Environment Agency mitigation measure.

WFD mitigation measure	Appraisal of the Scheme
Educate landowners	It is likely this measure is not applicable to the River Lark Tributary 1 or the tributary to be crossed by the access road and therefore the Scheme will not impact the implementation of this measure.

5.4.4 There are currently no mitigation measures identified as applicable for Kennett–Lee Brook which have not yet been implemented. Therefore, it is considered that the Scheme will not prevent mitigation measures for Kennett – Lee Brook (Lee Brook) being carried out.

5.4.5 There are currently no mitigation measures identified as applicable for Lee Brook which have not yet been implemented. Therefore, it is considered that the Scheme will not prevent mitigation measures for Lee Brook being carried out.

5.4.6 The following mitigation measures have been identified as applicable to Soham Lode, but have not yet been implemented:

a. Avoid the need to dredge;
b. Sediment management strategy;
c. Maintenance – minimise habitat impact; and
d. Maintenance – prevent sediment transfer.

5.4.7 Within Sunnica West Site B, an ecological mitigation area has been designated over the right bank floodplain of the River Snail (Soham Lode WFD water body). This mitigation area has the potential to help achieve mitigation measures related to sediment control. The Scheme is not anticipated to have any influence on maintenance or dredging regimes and therefore will not prevent the implementation of these measures. Potentially, in fields where livestock are present and poaching of river banks occurs, or crop fields that are ploughed/tilled/left fallow, the Scheme may locally reduce erosion of fine sediment into watercourses.

5.4.8 The following mitigation measures have been identified as applicable to New River, but have not yet been implemented:

a. In channel morphological diversity;
b. Floodplain connectivity;
c. Fish passes;
d. Educate landowners; and
e. Enhance ecology (recreation).

5.4.9 Lengths of New River located within the Site are limited given the only interaction of the water body with the Scheme are the cable crossings of the water body. Therefore, land use surrounding New River will generally not be affected by the Scheme and it is unlikely the Scheme will prevent the mitigation measures being implemented. Likewise, the Scheme should present no barrier to in-channel

improvements such as in channel morphological diversity or fish passes being implemented, especially given the cables will be installed 2m below the river bed.

5.4.10 Preserve or restore habitats is the only mitigation measure identified as appropriate to Burwell Lode that has not yet been implemented. The interaction of the Scheme with Burwell Lode is limited to the cable crossings of the water body and the Burwell National Grid Substation extension, and it is unlikely the Scheme will present a barrier to the mitigation measure being implemented.

5.4.11 Overall, the Scheme will not present a barrier to the implementation of mitigation measures identified for each of the WFD water bodies scoped into this assessment. In addition, a number of high level enhancement opportunities within and local to the Scheme have been identified, and are presented in Section 6.

Assessment Against WFD Objectives

5.4.12 The compliance of the Scheme is determined based upon an assessment against the following objectives relating to WFD quality elements, including biological, physico-chemical and hydromorphological quality elements:

a. Whether the Scheme will cause deterioration in the Ecological Potential or Status of a water body;

b. Whether the Scheme will compromise the ability of a water body to achieve Good Ecological Status or Potential;

c. Whether the Scheme will cause a permanent exclusion or compromise achievement of the WFD objectives (e.g. mitigation measures) in other water bodies within the same RBD; and

d. Whether the Scheme will contribute to the delivery of the WFD objectives (e.g. mitigation measures).

5.4.13 The WFD compliance assessment for the proposed Scheme is summarised in **Table 25**.

Table 25 Compliance assessment of the Scheme regarding WFD status

Compliance elements	Water Body	Ground water body
Water body name and ID	*Kennett – Lee Brook (Lee Brook)(GB105033043020); Lark Downstream of Mill Street Bridge (GB105033043052); Kennett-Lee Brook (River Kennett) (GB105033042990); Lee Brook (GB105033042970); Soham Lode (GB105033042860); New River (GB105033042780); and Burwell Lode (GB105033042720)*	*Cam and Ely Ouse Chalk (GB40501G400500)*

Compliance elements	Water Body	Ground water body
Deterioration in the status/ potential of the water body	The Scheme is not anticipated to cause a deterioration in potential.	The Scheme is not anticipated to cause a deterioration in status.
Ability of the water body to achieve Good Ecological Potential / Status	The Scheme and associated mitigation would not prevent the implementation of WFD mitigation measures towards Good Ecological Potential.	The Scheme and associated mitigation would not prevent the water body reaching Good Status.
Impact on the WFD objectives of other water bodies within the same RBD	No downstream or upstream impacts are anticipated associated with the Scheme and the mitigation measures proposed	No wider impacts are anticipated associated with the Scheme and the mitigation measures proposed.
Ability to contribute to the delivery of the WFD objectives	The Scheme is committed to provide enhancement of watercourses within the Order limits. This will be delivered through a WFD Mitigation and Enhancement Strategy that is secured in the DCO through the Framework CEMP. Initial options for possible enhancement are described in Section 6.	The Scheme does contribute to the delivery of WFD objectives.

5.4.14 **Table 25** demonstrates that the Scheme is anticipated to be compliant with the objectives of the WFD.

6 Enhancement opportunities

6.1.1 A number of high-level enhancement opportunities have been considered for the water bodies within this assessment and are presented in **Table 26**. The opportunities consider the baseline conditions of the water bodies, mitigation measures where designated, and the reasons for not achieving good for each water body.

6.1.2 A number of the water bodies within this assessment are crossed by the cable corridor and are only within the Order limits for a short length. Therefore, the implementation of enhancement opportunities may be limited to water bodies where a significant length of the watercourse is within the Order limits, such as the Kennett – Lee Brook (Lee Brook), River Lark Tributary 1 (Lark Downstream of Mill Street Bridge WFD water body), Lee Brook, and River Snail (i.e. Soham Lode WFD water body).

Table 26 Potential enhancement opportunities

WFD water body	Specific water body within WFD designated water body	Enhancement opportunities
Kennett – Lee Brook	Kennett – Lee Brook (Lee Brook)	Create local in-channel morphological diversity, potentially through the use of inset berms or woody material. Reconnect the channel to the floodplain locally, potentially through inset floodplain areas, this will increase diversity in wetted habitat. Improve buffer strips and implement riparian planting.
Lark Downstream of Mill Street Bridge	River Lark Tributary 1	Channel is considered to be artificial and for drainage purposes only. If applicable, channel could be mostly filled in to create a wider seasonal wetland area. Reduce maintenance of grass and plant appropriate vegetation.
Kennett-Lee Brook	Kennett-Lee Brook (River Kennett)	Re-naturalisation of planform where appropriate, improve floodplain connectivity and allow connectivity to palaeo channels. Site access to this water body was limited, so enhancement opportunities may require further investigation.
Lee Brook	Lee Brook	Flood map outlines suggest flow spills out of bank towards the north east extent of Sunnica West Site A. Measures to enhance floodplain connectivity and diversify habitats such as creation of inset floodplain areas and riparian planting may be appropriate.
Soham Lode	River Snail	The change in land use at the Sunnica West Site B should reduce sediment inputs to the channel from poaching, otherwise fencing is recommended.

WFD water body	Specific water body within WFD designated water body	Enhancement opportunities
		Local channel narrowing with appropriate features to reduce siltation of the channel bed and improve morphological and flow diversity. Improve floodplain connectivity, which may be achievable through the creation of inset floodplain areas. Riparian planting.
New River	Tributary of New River and New River	Channels are currently extremely over-deep, and it may not be feasible to raise the bed of the water bodies. Bank lowering and inset floodplain creation will enable some connectivity to the floodplain. Riparian planting and ensuring a robust buffer zone along the river banks is maintained would be beneficial to ensure agricultural runoff to the water bodies is minimal.
Burwell Lode	Catch Water Drain, numerous land drains, and Burwell Lode	Improve buffer zones of water bodies through riparian planting.

6.1.3 The design of reinstatement proposals and enhancement opportunities will be undertaken during detailed design post-consent. This will be undertaken as part of a WFD Mitigation and Enhancement Strategy that is secured in the DCO through the Framework CEMP (provided in **Appendix 16C** of the Environmental Statement **[EN010106/APP/6.2]**).

7 Conclusion

7.1.1 This WFDa assesses the impacts and identifies appropriate mitigation measures for the proposed works, built components and activities associated with the construction, operation and decommissioning of the Scheme.

7.1.2 This assessment concludes that the Scheme would not impact on the WFD status or objectives of any associated surface water or groundwater bodies in close proximity to the Scheme.

7.1.3 Furthermore, the Scheme would not prevent the achievement of the wider WFD objectives in the Anglian RBMP and is not predicted to have an impact on any other water body within the Anglian RBD or mitigation measures developed to achieve good status.

8 References

Ref. 1 Official Journal of the European Communities (2000) Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy

Ref. 2 The Water Environment (Water Framework Directive) (England Wales) Regulations (2016)

Ref. 3 Environment Agency (2016) Water Framework Directive risk assessment: How to assess the risk of your activity.

Ref. 4 The Planning Inspectorate (2017) The Water Framework Directive - Advice note eighteen: The Water Framework Directive.

Ref. 5 Ordnance Survey Mapping

Ref. 6 British Geological Survey Borehole and online mapping

Ref. 7 Bing Maps

Ref. 8 Historic mapping: National Library of Scotland

Ref. 9 Environment Agency Catchment Data Explorer website

Ref. 10 National River Flow Archive website

Ref. 11 The Met Office Website

Ref. 12 Environment Agency Ecology Data Explorer

Ref. 13 Soilscapes website

Ref. 14 CIRIA (2015) The SuDS Manual 2nd Eds

Ref. 15 Environment Agency (2015) Anglian River Basin Management Plan.

Ref. 16 The Habitats Directive

Ref. 17 Natural Environment and Rural Communities Act 2006

Annex 1

560000 565000 570000

275000 270000 265000

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order limits
- 1km Scheme Buffer
- Direction of Flow
- Main Rivers
- Ordinary Watercourse
- Flood Defences
- Indicative Rated Area
- County Boundary
- Flood Zone 2
- Flood Zone 3
- Waterbodies
- Areas Benefiting from Flood Defences
- River Flow Direction
- Discharge Permit
- Surface Water Abstraction License

WFD Status and Hydromorphological Designation

- Moderate, Artificial
- Moderate, Heavily Modified

Lodes-Granta Scheme

- Flow Site
- Groundwater Support Borehole
- Outfall
- Pipeline

NOTES:
a. Ponds and small lakes are not shown at this scale
b. Please see Figure 2-1 for nature conservation sites
c. Entire study area is within a Surface Water Nitrate Vulnerable Zone
d. No Surface Water Drinking Water Safeguard Zones in the study area
e. Study area is within a Surface Water Drinking Water Protected Area

NOTE:
Document Reference: EN010106/APP/6.3
APFP Regulation 5(2)(a) and 5(2)(i)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 1
SURFACE WATER BODIES AND THEIR ATTRIBUTES

Drawn	Checked	Approved	Date
LL	DW	NC	12/10/2021

AECOM Internal Project No. 60589004
Scale @ A3 1:52,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number 60589004_ES_AP_WAT_001
Rev 0

N

0 1,000 2,000m

File Name:\\eu.aecomnet.com\UKUKCBG1\Jobs\PR.334327_Sunnica_Energy_Farm\400_Technical\434_Technical Disciplines\17. GIS\Layout\ES\Appendix\Chapter 9 - Appendix 9B WFD\210504_SunnicaEnergyFarm_Fig1_SurfaceWaterBodies_andAttributes.mxd

560000 565000 570000

275000 270000 265000

Cam and Ely Ouse Woburn Sands

Cam and Ely Ouse Chalk

G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 G11 G12 G13 G14 G15 G16 G17 G19 G18 G20 G21 G22 G23 G24 G25 G26 G27 G28 G29 G30 G31 G32 G33 G34 G35 G36 G37 G38 G39 G40 G41 G42 G43 G44 G45 G46 G47 G48 G49 G50 G51 G52 G53 G54 G55 G56 G57 G58 G59 G60 G61 G62 G63 G64 G65 G66 G67 G68 G69 G70 G71 G72 G73 G74 G75 G76 G77 G78 G79 G80 G81

0 1,000 2,000m

N

File Name:\\eu.aecomnet.com\UK\UKCBG1\Jobs\PR-334327_Sunnica_Energy_Farm\400_Technical\434_Technical Disciplines\17. GIS\Layout\ES\Appendix\Chapter 9 - Appendix 9B WFD\210504_SunnicaEnergyFarm_Fig2_GroundwaterFeatures.mxd

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order limits
- 1km Scheme Buffer
- River
- Groundwater Abstraction License
- Private Water Supplies
- Groundwater Nitrate Vulnerable Zone

Groundwater WFD Body

- Poor Status

Source Protection Zones

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Lodes-Granta Scheme

- Flow Site
- Groundwater Support Borehole
- Outfall
- Pipeline

NOTES:
a. Ponds and small lakes are not shown at this scale
b. Please see Figure 2-1 for nature conservation sites
c. No Groudwater Water Drinking Water Safeguard Zones in the study area

NOTE:
Document Reference: EN010106/APP/6.3
APFP Regulation 5(2)(a) and 5(2)(l)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title
sunnica energy farm

Drawing Title
FIGURE 2
GROUNDWATER FEATURES

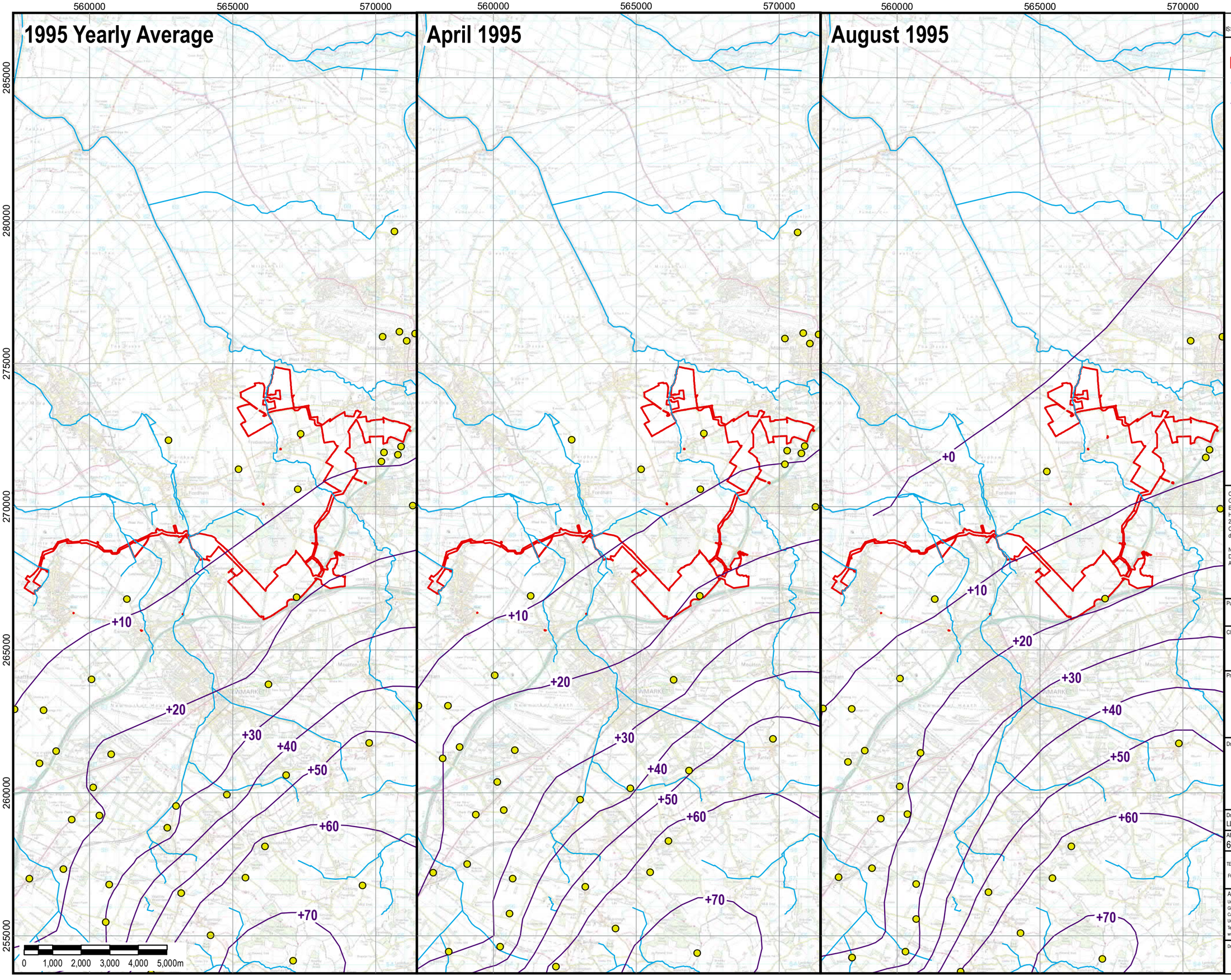
Drawn	Checked	Approved	Date
LL	DW	NC	12/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:52,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

AECOM

Drawing Number	Rev
60589004_ES_AP_WAT_002	0



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- The Order limits
- Main River
- Chalk Groundwater Contour
- Groundwater Observation Borehole included in Contouring

NOTE:
Document Reference: EN010106/APP/6.3
APFP Regulation 5(2)(a) and 5(2)(l)

Purpose of Issue
FOR DCO SUBMISSION

Client
SUNNICA LTD

Project Title

Drawing Title
FIGURE 3
CHALK GROUNDWATER CONTOURS

Drawn	Checked	Approved	Date
LL	DW	NC	12/10/2021

AECOM Internal Project No.	Scale @ A3
60589004	1:120,000

AECOM
Unit 1 Wellbrook Court,
Girton,
Cambridge, CB3 0NA
United Kingdom
Telephone (01223) 488000
www.aecom.com

Drawing Number	Rev
60589004_ES_AP_WAT_003	0

File Name:\\eu.aecomnet.com\UKUKCBG1\Jobs\PR-334327_Sunnica_Energy_Farm\400_Technical\434_Technical Disciplines\17. GIS\Layout\ES\Appendix\Chapter 9 - Appendix 9B \WFD\210504_SunnicaEnergyFarm_Fig3_ChalkGroundwaterContours.mxd