Cottam Solar Project

Water Framework Directive Assessment

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Cottam
SOLAR PROJECT

Water Framework Directive Assessment

Cottam Solar Scheme

Presented to: Cottam Solar Project Limited

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Protecting people and planet

Report Details

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1.0 Introduction

1.1 Appointment

1.1.1 Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Cottam Solar Project Limited (the "Applicant") to carry out Water Framework Assessment for the Cottam Solar Project (the "Scheme").

1.1.2 The Scheme comprises a number of land parcels (the "Site" or "Sites") described as Cottam 1, 2, 3a and 3b for the solar arrays, grid connection infrastructure and energy storage; and the cable route corridors. For further details of the Scheme, please see Chapter 4 of the Environmental Statement (ES): Scheme Description.

1.1.3 Where a Site has multiple parcels these have been labelled as "Sub-Site [X]" in accordance with field numbering plans that are included within the ES. Cottam 1 is subdivided into three distinct smaller Sites (North, West and South) and therefore, the assessment of each area has been undertaken separately. Furthermore, Cottam 1 North and West are further divided into three Sub-Sites each with Cottam 1 North containing Sub-Sites A, B and C and Cottam 1 West containing Sub-Sites E, F and G.

1.2 Project Understanding

1.2.1 The aim of the WFD Assessment is to assess the impacts of the proposed works associated with the Scheme against the WFD parameters. The assessment includes a summary of the current local conditions, the potential for the Scheme to contribute towards WFD objectives and any likely alterations to the WFD classifications that could arise from the Scheme.

1.2.2 This WFD Assessment is required to demonstrate that the Scheme will not result in deterioration of the current quality status of the relevant WFD water bodies, and could provide improvements to the current status, in accordance with the objectives and measures set out in the Humber and Anglian River Basin District: River Basin Management Plans (RBMP).

1.2.3 This report has been produced in consultation with the Environment Agency and the Lead Local Flood Authority (LLFA).

1.3 Sources of Information

1.3.1 The following sources of information have been reviewed and assessed for the purpose of this FRA:

- EA Online Flood Maps[1];
- British Geological Society (BGS) Interactive Map[2];
- MAGIC Interactive Map[3];
- West Lindsey District Council Strategic Flood Risk Assessment (2009 SFRA);
- Lincolnshire County Council Preliminary Flood Risk Assessment (2011 PFRA);
- Nottinghamshire County Council Preliminary Flood Risk Assessment (2011 PFRA);
- The Planning Inspectorate. Advice Note eighteen: The Water Framework Directive (2017 TPI18)
- Bassetlaw District Council Strategic Flood Risk Assessment (2019 SFRA);

1 https://flood-map-for-planning.service.gov.uk/
2 http://mapapps.bgs.ac.uk/geologyofbritain/home.html
3 http://www.magic.gov.uk/

1.4 Project Limitations

1.4.1 The wider Delta-Simons limitations are contained within Appendix A.

2.0 Scheme Description

2.1.1 The aim of this section of the report is to outline key environmental information associated with the baseline environment.

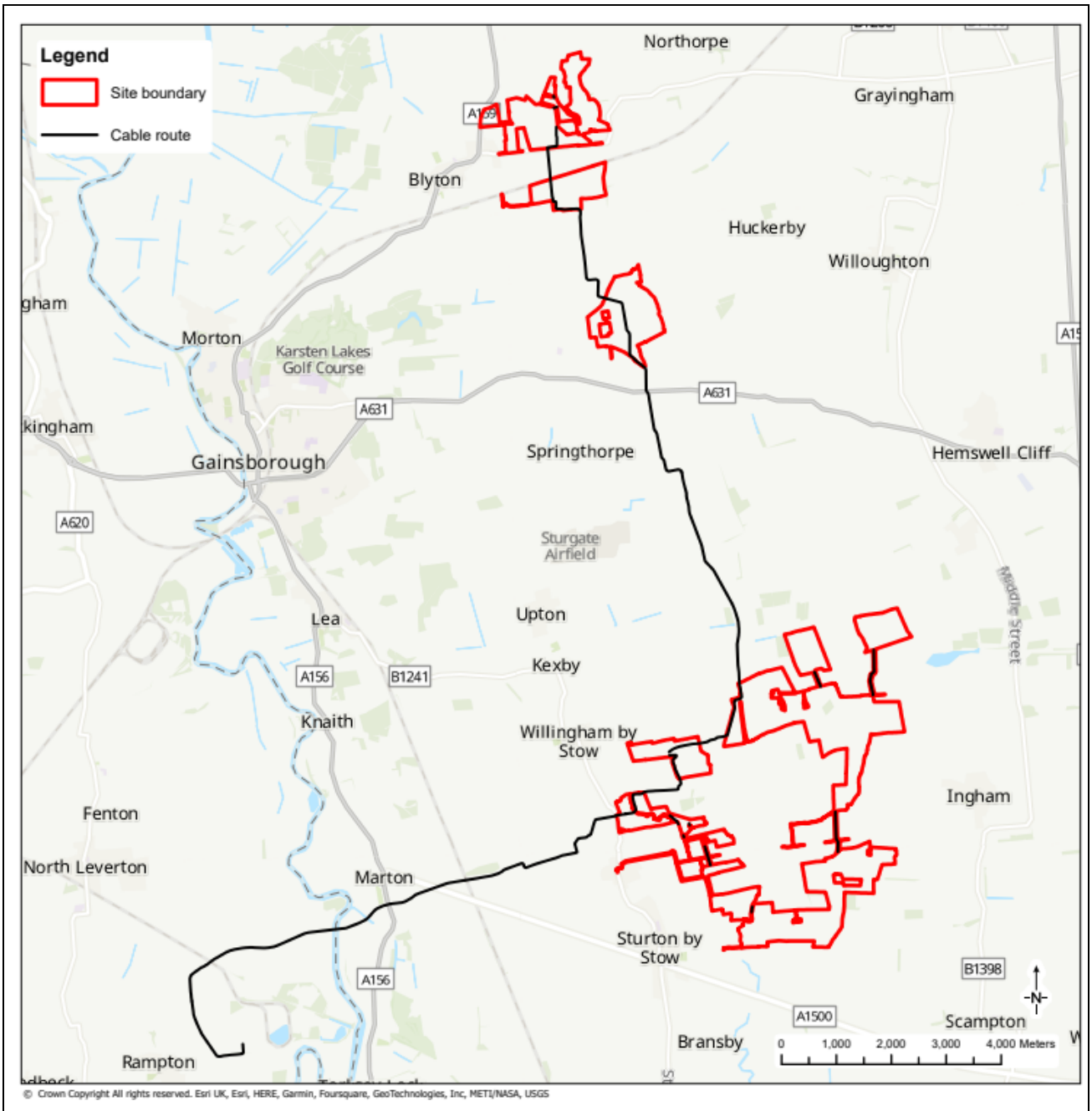


Figure 1: Scheme Location Plan

Co-ordinates	Extending from Approximately National Grid Reference 487929 , 397709 to 481300, 378910.	**Area (approx.)**	1,211 ha
Scheme Location and Description	The Scheme extends from Blyton, Gainsborough, DN21 3PF in the north to Cottam Power Station, Retford, DN22 0TF in the south. The Scheme is also approximately centred around Willingham by Stow, Gainsborough.		

	The Scheme is located in a rural to semi-rural region with mainly agricultural land bounding the Scheme. Residential properties associated with farms, villages and hamlets such as Stow, Willingham by Stow and Marton also bound the Scheme. The wider Cottam Power Station (ceased power production) is located adjacent to the Scheme in the western area. Discrete pockets of development comprising villages and farm buildings are present adjacent to the study area. In addition, Sturgate Airfield is located adjacent to the Scheme in the central area. Given the scale of the Scheme, existing Scheme conditions vary. Delta-Simons conducted a Site visit in July 2022, that visit combined with online mapping (including Google Maps / Google Streetview imagery (accessed October 2022) shows that the vast majority of the Scheme is greenfield comprising agricultural / arable fields. The proposed Cable Route crosses several watercourses and land drains.
Topography	Topographic levels to metres Above Ordnance Datum (m AOD) have been derived from a 1 m resolution Environment Agency (EA) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). A review of LiDAR ground elevation data shows the Scheme topography varies from approximately 24 m AOD in the north of the Site to 4 m AOD to the west of the Scheme near the River Trent. There are no significant breaks in slope with the exception of the river banks.
Hydrology	Given the scale of the scheme there are numerous watercourses that flow within and adjacent to it. The River Till flows in a generally southerly direction through the vicinity of the scheme. The upstream reach of Till flows from north to south-east through Sub-Sites E and F of Cottam 1 West. The watercourse also flows southwards through the western extent of Cottam 1 South. The River Trent flows in a southerly direction through the western extent of the cable route and therefore the Scheme. Both the River Trent and River Till are Main Rivers and is therefore the responsibility of the Environment Agency (EA) to maintain. Any watercourses that flow through the scheme which are not Main Rivers or within the Internal Drainage Board (IDB) IDB's catchment areas are designated as an Ordinary Watercourse (responsibility of the Lead Local Flood Authority (LLFA) to maintain). Over its length the cable route passes under a total of 31 watercourses including 21 Ordinary Watercourses as well as the River Trent and the River Till. The Scheme covers ten WFD surface water bodies, two River Basin Districts (RBDs) Anglian and Humber and two Management Catchments - (Lower Trent and Erewash and Witham); and two Operational Catchments (Trent and Tributaries and Upper Witham). According to the Envirocheck Report there are thirteen licenced surface water abstractions located on-Site in the western area associated with extraction from the River Trent/adjoining water course, listed for use in spray irrigation.
Geology	Reference to the BGS online mapping (1:50,000 scale) and the (1:50,000 Sheet Numbers 89 – Brigg, 101 – East Retford and 102 – Market Rasen) indicates the Scheme is underlain by superficial deposits including Till in the northern and central areas, Alluvium and the Holme Pierrepont Sand and Gravel Member in

	the southern areas and occasional discrete pockets of Glaciofluvial deposits in the south. The underling bedrock is generally Triassic sedimentary mudstones, siltstones and sandstones belonging to the Lias Group and noted to comprise the Charmouth Mudstone Formation in the most eastern area, the Scunthorpe Mudstone Formation in the central and northern areas and the Penarth and Mercia Mudstone Group in the west. The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a Site-specific basis. There are a number of BGS recorded boreholes[4] located within the cable corridor search area. Four boreholes Ref. SK89SE115-117 and SK89NE102 are located in the Pilham and Aisby area (between Cottam 2 and 3) and record a generalised sequence of Boulder Clay (Till) comprising of brown silt with occasional quartzite gravel. These boulder clay beds are interbedded by a bed of Glacial Sand and Gravel comprising of clayey sand with fine angular to rounded gravel. These superficial deposits were found to a maximum depth of 9.00 m below ground level (bgl) and are underlaid by dark grey mudstone from the Lower Lias. Groundwater was identified at 3.00 m bgl. South of Marton there are five boreholes in a linear trend moving northwest (Ref. SK88SW22 – 26) present on-Site. Additionally, borehole Ref. SK87NW41 is located adjacent to the A156 near Marton. Superficial material is generally granular up until the boreholes are in the vicinity of the River Trent, with slightly gravelly clayey sand found to completion of some boreholes at 12.00 m bgl. Bedrock comprising red mudstone was observed in SK88SW22 and SK87NW41 from 2.50 m bgl and 4.50 m bgl respectively. Boreholes Ref. SK88SW27 and SK88SW28 are present on the eastern and western banks of the River Trent respectively, within 50 m of the cable route boundary. The ground conditions generally comprising of silty clay and clayey silt with some sand (Alluvium). Granular material was found from 4.42 m bgl in SK88SW27 and 9.14 m bgl in SK88SW28. Bedrock comprising of stiff grey marl is found from 11.58 m bgl in SK88SW28 and no bedrock was identified in SK88SW27. Groundwater was generally identified at <2.00 m bgl. Three boreholes Ref. SW88SW17, SK87NW43, SK87NW44 and SK88SW8 are located to the north of Cottam Power Station and record a generalised sequence of light brown clay to a maximum depth of 1.10 m bgl. Underlain by clayey sand/sandy gravel to depths between 2.10 m bgl and 8.00 m bgl. Mudstone bedrock is recorded beneath the superficial deposits. SK87NW139, SK87NW108-109 and SK87NW45 are located on or to the south of Cottam Power Station. The ground conditions are recorded to comprise ash Made Ground in one location underlain by very dense slightly gravelly sand suggested to be a possible fill found to a maximum depth of 6.60 m bgl. Boreholes to the south record a thin layer of clay Alluvium underlain by medium dense sand and gravels to approximately 10.00 m bgl, followed by mudstone bedrock initially recorded as firm to stiff clay/silt. Groundwater was recorded between 3.00 – 4.00 m bgl.
Hydrogeology	According to the EA's Aquifer Designation data, obtained from MAGIC Map's online mapping [December 2022], indicates that the Alluvium, Holme Peirrepont Sand and Gravel Member and Glacio-fluvial deposits classify as

4 bgs.ac.uk/viewer

	Secondary A Aquifers and the Till classifies as a Secondary (Undifferentiated) Aquifer. The underlying Scunthorpe Mudstone Formation and Mercia Mudstone bedrock classify as Secondary B Aquifers and the Charmouth Mudstone Formation and Penarth Group classify as a Secondary (Undifferentiated) Aquifers. Secondary A Aquifers are 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'. Secondary B Aquifers are 'predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers'. Secondary Undifferentiated Aquifers are assigned in 'cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type'. The EA's 'Source Protection Zones' data, obtained from MAGIC Map's online mapping [December 2022], indicates that the Scheme is not located in or within 1 km of a designated groundwater Source Protection Zone. According to the Envirocheck Report there are no licensed groundwater abstractions on-Site. Within the wider area abstractions relate to mineral washing (Rampton) and industrial processing (Cottam Power Station). The soils within the northern and south-western extent of the scheme (Trent and Tributaries Operational Catchment) are generally described by Soilscapes (Cranfield Soil and AgriFood Institute (CSAI)) as soil dominated by slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. The soils within the central and south-eastern extent of the scheme extents (Witham Upper Operational Catchment) are comprised of shallow, lime-rich soils to the east of the catchment and a higher proportion of slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils to the east.
Groundwater Levels and Flow Direction	The available BGS borehole information indicated the presence of shallow groundwater (<2.00 m bgl) adjacent to the River Trent. Drainage ditches are present across the Scheme, as such, perched groundwater may be present. Groundwater is expected to flow locally towards drainage channels and regionally towards the River Trent or River Till.
Local Drainage	Given the rural setting of the vast majority of the Scheme the presence of sewerage infrastructure is unlikely.
Ecological Receptors	From the information provided within the Envirocheck Report there are no statutory ecological receptors on or within 500 m of the Scheme.
Environmental Database Review	The Landmark Envirocheck® Report provides a database of environmental information held by various statutory bodies including the EA, Local Authority (LA), Health & Safety Executive (HSE) and Public Health England amongst others. A copy of the Envirocheck Report is provided in Appendix E of the Preliminary Geo-Environmental Risk Assessment produced by Delta-Simons and the most relevant information is summarised below.

	Features On-Site • Four Pollution Incidences to Controlled Water, all of which were categorised as minor and as such are not considered further; • A historical landfill site (Rampton Gravel Pit) located to the south east of Cottam Power Station. The first input date is listed as December 1993, no further information is provided; • Four Licensed Waste Management Facilities (Landfill Boundaries) listed as Cottam Ash Disposal, Rampton R2 (located adjacent to the power station), and Cottam Power Station; • A single Licensed Waste Management Facilities (Locations) entry for the use of lagoons at Cottam Power Station; and • Four Contemporary Trade Entries for Fertilisers, car breakers and agricultural engineers. The Scheme will be designed to avoid key features such as identified landfill sites. In addition, two underground electrical cables are noted on-Site in the area of Cottam Power Station. **Potentially Contaminative Features Off-Site** • Numerous records relating to Integrated Pollution Controls, Integrated Pollution Prevention and Control entries are listed for Cottam Power Station and activities relating to power generation; • Cottam Power Station is also recorded as a as a Control of Major Accident Hazards Site (COMAH) and operates under Planning Hazardous Substance Consent; • A Registered Landfill Site associated with the West Bank of the River Trent which is noted to have accepted river dredging waste and is also recorded as dormant; • Two Registered Waste Treatment or Disposal sites for very small (less than 10,000 tonnes per year) scrapyards with transfer stations. Operated by W J Furber Ltd located approximately 1.60 km south east of Springthorpe and G L Barker located approximately 800 m south of Blyton. G L Barker also has a surrendered Licensed Waste Management Facilities (Locations) entry listed for Metal recycling Sites the license was surrendered in November 2003; • A single Licensed Waste Management Facilities (Locations) operated by P.H. Europe Ltd for Household, Commercial and Industrial Transfer Stations which has been subsequently expired. P.H. Europe Ltd also has a Registered waster Transfer Sites listing for the same property with a small maximum input rate (equal or greater than 10,00 and less than 25,000 tonnes per year). The authorised waster is Meat and Bonemeal; and • Several Contemporary Trade Entries listed for Cottam Power Station site for cement manufacturers, electricity companies, lubrication services and engineering materials.
Proposed Scheme Conditions	The wider proposed development at the Scheme is for a ground mounted solar photo-voltaic plant and associated electrical equipment battery storage, cable route and access. The Scheme description is detailed in Chapter 4 'Scheme Description' of the Supporting Environmental Statement (ES).

3.0 Introduction to the Water Framework Directive

3.1.1 The Water Framework Directive (WFD) (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000) is a European Union Directive which committed member states to achieve good qualitative and quantitative status of all water bodies by 2015. Under the Directive water bodies are defined as all ground and surface waters, including rivers, lakes, transitional waters and coastal waters (up to one nautical mile from shore).

3.1.2 It was not possible to achieve good status of all water bodies by 2015 and therefore the outstanding water bodies have objectives set for 2021 or 2027.

3.1.3 The WFD is transposed into law in England and Wales by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (the 2017 Regulations).

3.2 Determination of Good Status

Surface Water

3.2.1 Good status is determined from the ecological and chemical status of surface waters. These statuses are assessed according to the following criteria:

- Biological quality (fish, benthic invertebrates, aquatic flora);
- Hydromorphological quality (e.g. riverbank structure, river continuity and substrate of the riverbed); and
- Physical-chemical quality (e.g. temperature, oxygenation and nutrient conditions).

3.2.2 The chemical quality refers to environmental quality standards for river basin specific pollutants. These standards specify maximum concentrations for specific water pollutants. The WFD operates on a 'one out, all out' basis, so if one such concentration is exceeded, then the water body will not be classed as having a good status. The pure chemical status of surface waters is therefore classified as either good or fail with the physical-chemical quality indicators being classified as either high, good, moderate, poor or bad.

3.2.3 The ecological status of surface waters is classified as being high, good, moderate, poor or bad, whilst water bodies that have been modified (e.g. canals or contain significant flood defences) are classed as 'Heavily Modified Water bodies' (HMWB) and have to reach at least good potential by their objective year.

Groundwater

3.2.4 The WFD stipulates that groundwater must achieve good quantitative status and good chemical status by their objective year. Groundwater bodies are classified as either good or poor. The quantity status considers elements such as impacts of saline intrusion, ability to serve groundwater and surface water abstractions, and ability to support groundwater dependent terrestrial ecosystems. The chemical status refers to the environmental quality standards for river basin specific pollutants and the priority substances specified under the WFD.

River Basin Management Plans

3.2.5 The WFD introduced RBDs in order to better manage watercourses without administrative and political boundaries. Each river basin is managed to achieve at least good status according to RBMPs, which provide a clear indication of how the objectives set for the river basin are to be reached within the required timescale.

4.0 Water Framework Directive Assessments

4.1.1 WFD Assessments are undertaken to demonstrate that proposed works (either at strategy level or detailed design/implementation stage) can be undertaken without impacting the status of water bodies or preventing future works to enable the water bodies to achieve good status/potential.

4.1.2 Determination of WFD compliance comprises a series of steps intended to establish the potential significant effects of the Proposed Scheme, at an appropriate level of detail, and then to examine whether the identified significant effects contravene the conditions of the WFD.

4.1.3 The following assessment objectives (derived from the Environmental Objectives of the Directive) are used to determine whether the Scheme, in and around the water environment, which is affected by the Scheme, complies with the overarching objectives of the WFD:

- Objective 1: To prevent deterioration in the ecological status of the water body;
- Objective 2: To prevent the introduction of impediments to the attainment of good WFD status for the water body;
- Objective 3: To ensure that the attainment of the WFD objectives for the water body are not compromised; and
- Objective 4: To ensure the achievement of the WFD objectives in other water bodies within the same catchment are not permanently excluded or compromised.

4.1.4 The assessment process is usually as follows:

- Screening of the Scheme against the ecological, chemical and quantitative status objectives and elements to determine if the project has any potential for impact on the criteria identified for any water bodies;
- Scope the assessment for those criteria where a potential adverse effect has been identified to determine the effects on quality elements;
- Identified significant effects are then considered in relation to the ecological and supporting chemical and hydromorphological status objectives;
- For HMWBs the preferred option is then also assessed against their relevant mitigation measures; and
- Article 4.7 test, if the preferred option is predicted to cause deterioration in water body status or prevent the water body from meeting any of its objectives, then assessment is required against the conditions listed in WFD Article 4.7, all of which must be met for the preferred option to proceed without contravening the WFD. The impact of the scheme on other water bodies within the River Basin District must also be considered (Article 4.8) and protection given by existing Community legislation to any Protected Areas must also be maintained (Article 4.9).

4.2 Assessment Methodology

4.2.1 Given the nature of the proposals (Solar Scheme) and low impact nature of the proposed construction techniques, the works were undertaken using the following methodology:

- Collection of baseline data to identify the current status as well as future baseline and ability of the water bodies within and in close proximity to the proposed works to meet the WFD objectives;
- Collection of proposed scheme baseline data;
- Consultation with relevant authorities; and

- Preliminary assessment of the potential significant effects to the identified surface water bodies; this involves identifying the significant effects that could improve the WFD status and / or affect the ability of the water bodies to meet the objectives of the WFD.

5.0 Baseline Desk Study

5.1 Catchment characteristics

5.1.1 The Scheme covers Ten WFD surface water bodies. The Ten waterbodies are separated over two RBDs the Anglian and Humber; two Management Catchments - (Lower Trent and Erewash and Witham); and two Operational Catchments (Trent and Tributaries and Upper Witham). It should be noted that previously the River Till Operational Catchment was separated into the Till (Witham) and Lower Till. The WFD water bodies and Operational Catchments are provided as Figure 2 included as Appendix B and in Table 1 below:

Figure 2: Waterbody Catchments

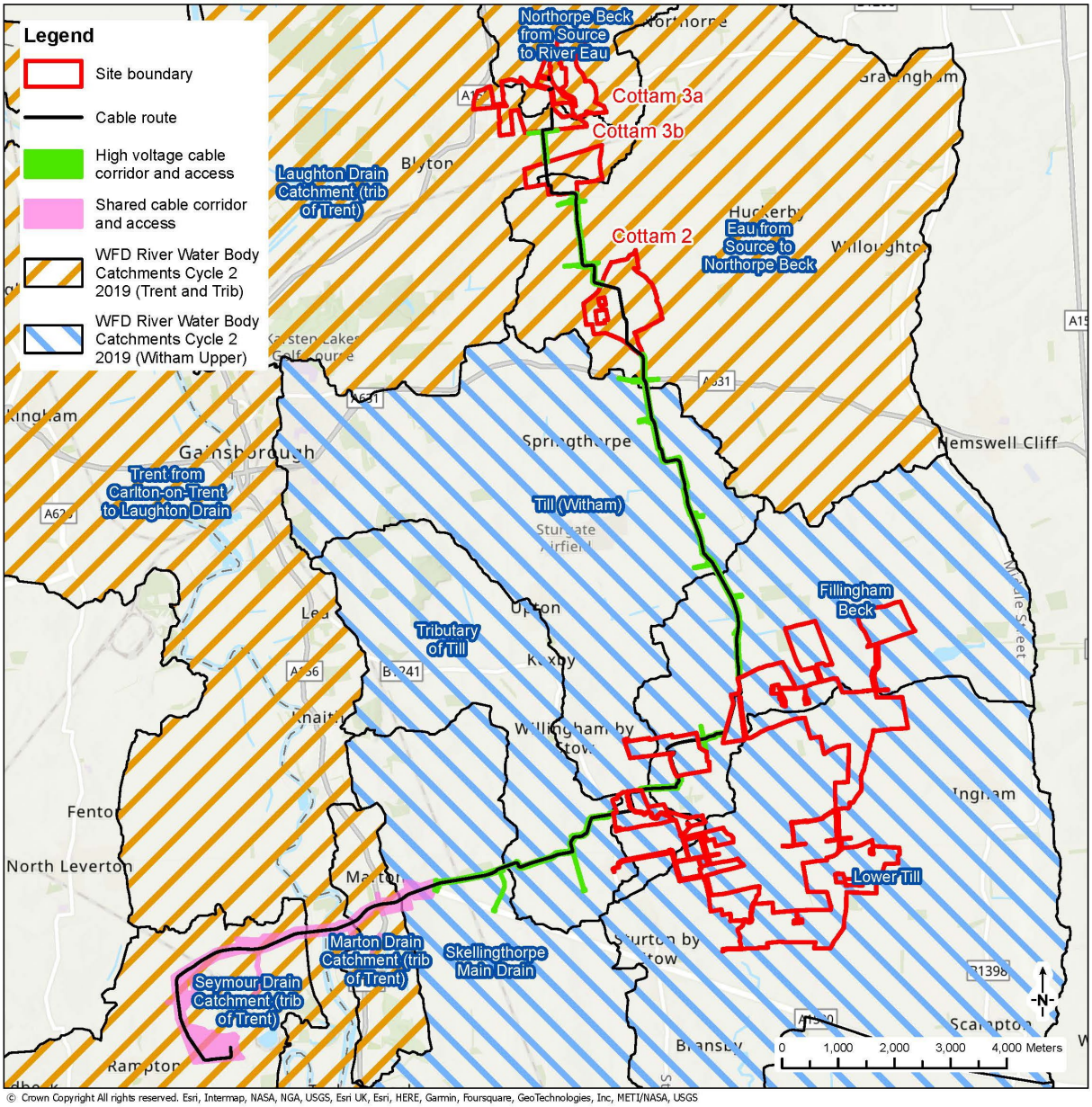


Table 1: Waterbody Catchments

River Basin District	Management Catchment	Operational Catchment	Water Body
Anglian	Witham	Upper Witham	Fillingham Beck
			Skellingthorpe Main Drain
			River Till
			Tributary of the Till
Humber	Trent Lower and Erewash	Trent and tributaries	Marton Drain Catchment (trib of Trent)
			Eau from Source to Northorpe Beck
			Northorpe Beck from source to River Eau
			Laughton Drain Catchment
			Trent from Carlton-on-Trent to Laughton Drain
			Seymour Drain Catchment (trib of Trent)

5.1.2 The ten identified WFD water bodies all have very similar characteristics; therefore, broad description of their host Operational Catchment is provided below and where they differ. The individual WFD status tables are included as Appendix C.

5.1.3 The Scheme falls within two WFD groundwater bodies. The north and south-western extents fall within the Lower Trent Erewash – Secondary Combined groundwater body (GB40402G990300) whilst the central eastern extent falls within the Witham Lias groundwater body (GB40502G401400) see Appendix D.

5.2 General characteristics

Upper Witham

5.2.1 The Upper Witham catchment has a maximum elevation of around 150-160 m AOD, the catchment generally falls south to north, before flowing eastwards towards its confluence with The Haven.

5.2.2 The Scheme is located in the northern extent of the catchment which feeds into the River Till and tributaries which generally flows in a southerly direction. The vast majority of the catchment comprises arable farmland and improved grassland. This strong agricultural influence along with low lying land managed by IDB's has resulted in a heavily modified and artificial surface water drainage network.

Trent and Tributaries

5.2.3 The Trent and Tributaries water body is a sizeable catchment which generally flows north with a topographical high of around 90 m AOD. The catchment eventually feeds into the River Humber east of Goole, East Riding of Yorkshire. The Scheme occupies a small portion of the catchment, most of which is comprised of the proposed Cable Route Corridor. Similarly, the catchment is heavily dominated by agricultural land which influences the character and planform of the surface water network therein.

5.2.4 The main River Trent is designated as 'Artificial' under the WFD due to extensive modification required to maintain it as a navigable waterway.

5.3 Catchment Hydrology

Upper Witham

The Upper Within Catchment has poor coverage of readily available hydrology data with just one National River Flow Archive gauge situated in the uppermost region of the catchment: no data are available for the screened-in WFD water bodies. Annual average rainfall for the region of the catchment upstream of 30001 - Witham at Claypole Mill[5] is 632 mm and 615 mm for the periods 1941- 1970 and 1961-1990 respectively. River flow is reflective of the catchment's fairly small (297 km^2) area, with mean flow of 1.9m^3/s, baseflow (Q95) of 0.4 m^3/s and peak flow of 38 m^3/s.

Trent and Tributaries

3.7 The Trent and Tributaries catchment similarly has poor coverage of readily available hydrology data, with just one National River Flow Archive gauge situated in the uppermost region of the catchment: no data are available for the screened-in WFD water bodies. Nevertheless, annual average rainfall for the portion of the catchment upstream of the 28022 - Trent at North Muskham2[6] is 756 mm and 747 mm for the periods 1941-1970 and 1961-1990 respectively. River flow is reflective of the sizeable (8231 km2) catchment area upstream of the gauge, with mean flow of 90 m^3/s, baseflow (Q95) of 29 m^3/s and peak flow of over 1000 m^3/s.

5.4 Catchment Geology and Soils

Upper Witham

5.4.1 A description of the underlying geology is included in Section 2.0 above.

5.4.2 Superficial geology within the Upper Witham Operational catchment is largely underlain alluvial deposits adjacent to river terrace deposits. Bedrock geology is comprised of Triassic sedimentary mudstones, siltstones and sandstones belonging to the Lias Group; while soils are comprised of shallow, lime-rich soils to the east of the catchment and a higher proportion of slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils to the east.

Trent and Tributaries

5.4.3 Superficial geology in the Trent and Tributaries Operation Catchment is similarly comprises deposits of alluvium bordered by older river terrace deposits, with aeolian sand deposits and glacial till comprising the remainder of the catchment area. Bedrock geology is dominated by Triassic sandstone, mudstones and siltstones (BGS, 2022) while soil is dominated by slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.

5.5 Historical Channel Change

Upper Witham

5.5.1 Analysis of the historical mapping record (NLS, 2022) reveals very little channel change over long-term and more recent timeframes respectively. This is because modifications to watercourses and excavation of land drains for agriculture took place many centuries before the emergence of formal mapping. However, given the topographic character of the catchment, and its generally low-lying elevation, its pre-modified state probably resembled a system of extensive wetland and bog habitats with strong lateral connectivity to the Witham and its tributaries, and vertical connectivity with underlying groundwater.

5 https://nrfa.ceh.ac.uk/data/station/info/30001
6 https://nrfa.ceh.ac.uk/data/station/info/28022

Trent and Tributaries

5.5.2 Historical mapping reveals very little channel change due to modifications predating formal Ordnance Survey (OS) mapping in the 19th Century. The Trent has a well-developed extremely dysfunctional and poorly connected floodplain that once occupied a complex network of riparian wetlands and floodplain bog. This has been lost to extensive land drainage, giving rise to the straightened and probably over-deepened surface water arrangement that comprises its contemporary drainage network.

5.6 WFD Status

5.6.1 The most recent (2019) WFD status of the ten screened-in surface water bodies and ground water bodies are provide in Table 2 overleaf:

	Surface Water									
Operational catchment	**Witham**				**Trent and Tributaries**					
Water bodies	**Fillingham Beck**	**Skellingthorpe Main Drain**	**Till (Witham)**	**Tributary of Till**	**Eau from Source to Northorpe Beck**	**Marton Drain Catchment (trib of Trent)**	**Seymour Drain Catchment (trib of Trent)**	**Laughton Drain Catchment (trib of Trent)**	**Northorpe Beck from Source to River Eau**	**Trent from Carlton-on-Trent to Laughton Drain**
Water Body ID	**GB105030062490**	**GB105030062390**	**GB105030062500**	**GB105030062480**	**GB104028057970**	**GB104028057840**	**GB104028058340**	**GB104028058120**	**GB104028057980**	**GB104028058480**
	Overall Water body status									
Artificial or Heavily Modified Water Body?	**Heavily modified**	**Heavily modified**	**Heavily modified**	**No**	**No**	**Heavily modified**	**Heavily modified**	**Heavily modified**	**No**	**Artificial**
Overall Ecological Status	**Moderate**	**Moderate**	**Moderate**	**Poor**	**Moderate**	**Moderate**	**Moderate**	**Moderate**	**Moderate**	**Moderate**
Biological quality elements	**Bad**	**Moderate**	**Good**	**Poor**	**Moderate**	**Good**	**Moderate**	**Moderate**	**Moderate**	**Bad**
Physico-chemical	**Moderate**	**Moderate**	**Moderate**	**High**	**Moderate**	**Moderate**	**Moderate**	**Moderate**	**Good**	**Moderate**
Hydromorphological Supporting Elements	**Supports Good**	**Supports Good**	**Supports Good**	**Supports Good**	**Supports Good**	**Supports Good**	**Supports Good**	**Supports Good**	**Supports Good**	**Supports Good**
Specific Pollutants	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Chemical	**Fail**	**Fail**	**Fail**	**Fail**	**Fail**	**Fail**	**Fail**	**Fail**	**Fail**	**Fail**
Priority Hazardous	**N/A**	**N/A**	**N/A**	**N/A**	**Good**	**Fail**	**Fail**	**Fail**	**Fail**	**Fail**
Other Pollutants	**Does not require assessment**	**Does not require assessment**	**Does not require assessment**	**Does not require assessment**	**Does not require assessment**	**Does not require assessment**	**Does not require assessment**	**Does not require assessment**	**Does not require assessment**	**Good**
	Groundwater									
Water Body	**Witham Lias Water Body (GB40502G401400)**				**Lower Trent Erewash - Secondary Combined (GB40402G990300)**					
Overall Water Body	**Good**				**Good**					
Quantitative	**Good**				**Good**					
Quantitative Status element	**Good**				**Good**					

Quantitative Dependent Surface Water Body Status	**Good**	**Good**
Quantitative GWDTEs test	**Good**	**Good**
Quantitative Saline Intrusion	**Good**	**Good**
Quantitative Water Balance	**Good**	**Good**
Chemical (GW)	**Good**	**Good**
Chemical Status element	**Good**	**Good**
Chemical Dependent Surface Water Body Status	**Good**	**Good**
Chemical Drinking Water Protected Area	**Good**	**Good**

6.0 WFD Screening

6.1.1 The purpose of the WFD screening is to determine the area of influence of the Scheme and to determine whether that influence has the potential to adversely impact upon WFD water body receptors. 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. Water body receptors that are screened out are not carried forward and thus do not require further consideration, justification is provided.

6.1.2 Certain activities on or near waterbodies are exempt from the requirement for Environmental Permits for Flood Risk Activities, and hence would unlikely require WFD assessments, as summarised in Table 3, below.

Table 3: Flood Risk Activity Exemptions

Activity	Type of Modification
Low impact maintenance activities (encourage removal of obstructions to fish/eel passage)	Re-pointing (block work structures)
	Void filling ('solid' structures)
	Re-positioning (rock or rubble or block work structures)
	Replacing elements (not whole structure)
	Re-facing
	Skimming/ covering/ grit blasting
	Cleaning and/or painting of a structure
Temporary works	Temporary scaffolding to enable bridge re-pointing
	Temporary clear span bridge with abutments set-back from bank top
	Temporary cofferdam(s) (if eel/ fish passage not impeded)
	Temporary flow diversion (if fish/ eel passage not impeded) such as flumes and porta-dams
	Repair works to bridge or culvert which do not extend the structure, reduce the cross-section of the river or affect the banks or bed of the river, or reduce conveyance
	Excavation of trial pits of boreholes in byelaw margin
	Structural investigation works of a bridge/ culvert/ flood defence such as intrusive tests, non-intrusive surveys
Footbridges	Footbridge over a main river not more than 8m wide from bank to bank
	Bridge deck/ parapet replacement/ repair works
Service crossing	Service crossing below the river bed, installed by directional drilling or micro tunnelling if more than 1.5 m below the natural bed line of the river

	Service crossing over a river. This includes those attached to the parapets of a bridge or encapsulated within the bridge's footpath or road
	Replacement, installation or dismantling of service crossing/ high voltage cable over a river
Other structures	Fishing platforms
	Fish/ eel pass on existing structure (where <2% water body length is impacted)
	Cattle drinks
	Mink rafts
	Fencing (if open panel/ chicken wire) in byelaw margin
	Outfall to a river ≤300 mm diameter

6.2 Screening of WFD surface water bodies

6.2.1 The Scheme interacts with a number of WFD surface water bodies. WFD Screening of these water bodies is provided in Table 4.

Table 4: Screening of WFD surface water bodies potentially impacted by the Scheme

Water Body	Screen In / Out
Fillingham Beck	In
Skellingthorpe Main Drain	In
River Till	In
Tributary of the Till	In
Marton Drain Catchment (trib of Trent)	In
Eau from Source to Northorpe Beck	In
Northorpe Beck from source to River Eau	In
Laughton Drain Catchment	In
Trent from Carlton-on-Trent to Laughton Drain	In
Seymour Drain Catchment (trib of Trent)	In

6.2.2 The footprint of the Scheme interacts with these water bodies and therefore there is a risk to WFD quality elements and the ecological and chemical status of each receptor water body. Therefore, these water bodies are screened in for further assessment below.

6.3 Screening of WFD groundwater bodies

6.3.1 The Scheme interacts with a number of WFD groundwater bodies. WFD Screening of these water bodies is provided in Table 5.

Table 5: Screening of WFD groundwater bodies

Water Body	Screen In / Out
Lower Trent Erewash - Secondary Combined	In
Witham Lias	In

6.3.2 The WFD ground water bodies underlay the Scheme and therefore may be impacted depending on the depth of foundations/excavations and thickness of overlying superficial deposits. Therefore, these water bodies are screened in for further assessment. However, this is based on a precautionary assessment due to limitations on available scheme information. It is possible that once further scheme information is known this initial screening decision could be altered.

6.4 Screening of Activities

6.4.1 The Scheme comprises a number of activities that present a potential risk to the WFD status of the water body identified in the previous section. The screening assessment of activities pertaining to the Scheme is provided in Table 6.

Table 6: Screening of WFD groundwater bodies

Activity	Type of Modification
Proposed development including ground mounted solar photo-voltaic plant and associated electrical equipment battery storage and access.	The Scheme falls within Fillingham Beck, River Till, Eau from Source to Northorpe Beck, Northorpe Beck from source to River Eau, Laughton Drain Catchment, Trent from Carlton-on-Trent to Laughton Drain Catchments. Construction, decommissioning and operation phases pose a potential risk to WFD receptors or may prevent the identified water bodies from reaching their objectives. This is however a conservative assessment and potential mitigations are considered below.
Proposed Cable Corridor	The indicative Cable Route Corridor sits with the Fillingham Beck, Skellingthorpe Main Drain, River Till, Tributary of the Till, Marton Drain Catchment (trib of Trent), Eau from Source to Northorpe Beck, Laughton Drain Catchment, Trent from Carlton-on-Trent to Laughton Drain, Seymour Drain Catchment (trib of Trent) WFD water bodies. This is however a conservative assessment and potential mitigations are considered below.

7.0 Potential Significant Effects

7.1.1 An assessment of the potential likely significant effects of the Scheme during the Construction, Decommissioning and Operational Phases has been undertaken in Chapter 10 of the ES.

7.1.2 The potential likely significant effects of the Scheme during decommissioning are likely to be the same and no worse than (i.e. a worst case scenario basis) as those encountered during the construction phase. Therefore, those effects considered for construction below are similarly expected during the decommissioning phase.

Table 10.5: Summary of likely significant effects and receptors at risk if left unmitigated

Likely Significant Effect	Description
Construction / Decommissioning Phase	
Mud and Debris Blockages	There is the potential for mud and debris arising from the construction / decommissioning works to enter the existing surface water / land drainage system, causing blockages and restricting flow. This could result in localised flooding on Scheme, especially after heavy or prolonged rainfall. As the Scheme is at present predominantly agricultural the initial effect is considered to be limited. However, given the scale and phased nature of the scheme as construction progresses the likelihood of potentially significant construction effects could increase without mitigation.
Temporary Increase in Impermeable Area	Temporary increase in impermeable area during construction / decommissioning has the potential to increase flooding both on and off Scheme. Temporary hardstanding or compacted areas could result in rapid surface water runoff to local watercourses or cause an increase in overland flow. As the Scheme is Greenfield at present there is potential for overland flows to be created and for localised flooding to occur. Increased, un-regulated discharges into local watercourses could also increase the risk of flooding downstream.
Compaction of Soils	Construction of access tracks and movement of construction / decommissioning traffic, in the absence of construction good practice, can lead to compaction of the soil. This can reduce soil permeability, potentially leading to increased run-off rates and increased erosion. The superficial geology underlying the Scheme is generally of low permeability and is in agricultural use, so the effects of compaction would not result in a substantial increase in runoff from existing conditions.
Silt-laden Runoff	During the construction / decommissioning phases of the Scheme, there are a number of activities which have the potential to negatively affect the local water environment. Activities such as potential dewatering of excavations, concreting, earthworks, and use of heavy plant can lead to significant quantities of silty runoff that may also be contaminated with oil, fuel and/or other construction materials, all of which have potential to cause pollution of the water environment and negatively affect the ecology it supports. Pollutants could be mobilised to watercourses or infiltrate to ground. The Scheme will involve construction of temporary access tracks to the Scheme. Access roads will be constructed with compacted self-binding aggregate fill materials. Shallow excavation of vegetation and soils would be necessary for placement of road surfaces. Access roads would form long linear features that, in the event of rainfall, could provide temporary drainage routes for surface water during the construction / decommissioning phase of

	the Scheme. With the potential for soil erosion and consequent liberation of sediment from shallow road excavations it would be necessary to ensure that pollution prevention measures within the Site are adequate to prevent migration of silt to surface watercourses and groundwater bodies.
Spillages, Leakages and Pollutants	During construction / decommissioning, fuel, hydraulic fluids, solvents, grouts, paints and detergents and other potentially polluting substances will be stored and / or used on the Scheme. Leaks and spillages of these substances could pollute groundwater bodies through infiltration as well as the surface watercourses within the Scheme and those nearby if their use is not carefully controlled and spillages enter existing flow pathways. In order to ensure statutory compliance including with the Water Resources Act 1991, measures to control the storage, handling and disposal of such substances will need to be in place prior to and during construction / decommissioning. The construction compound locations have not been determined, nor has it been confirmed at this stage whether concrete will be batched off-site. Therefore, it has been assumed that these could be sited next to existing flow pathways.
Inappropriate Wastewater Disposal from Welfare Facilities	In the absence of nearby public foul water sewers to which foul water from welfare facilities could be connected, suitably sized self-contained welfare should be provided by a specialist Contractor.
Operational Phase	
Increase in Permanent Impermeable Area	Given the nature of the Scheme, the increase in permanent impermeable area on the Site will be negligible, however equipment such as the proposed substations and energy storage areas will generate increased surface water runoff when compared to the current use of the Scheme. This could potentially increase localised pluvial flooding on the Scheme, as well as increase flood risk to people and property in the immediate surrounding area and downstream.
Increase in Discharge to Local Watercourses.	An increase in the volume of water discharged to local watercourses has the potential to increase the flood risk to areas downstream of the Scheme.
Blockage of Drainage Networks	There is the potential for mud and debris arising from the construction / decommissioning works to enter the existing surface water / land drainage system, causing blockages and restricting flow. This could result in localised flooding on the Scheme, especially after heavy or prolonged rainfall. As the Scheme is at present predominantly agricultural the initial effect is considered to be limited. Given the scale of the scheme as construction progresses the likelihood of significant construction effects increases.
Diffuse Pollution Contained in Urban Runoff	The operation of the Scheme may negatively effect upon the local water environment. Urban runoff from the Scheme, along with the associated infrastructure, could contain diffuse urban pollutants such as hydrocarbons, heavy metals, and nutrients as well as debris and silt which could ultimately be discharged to the nearby watercourses via surface water runoff or infiltrate to ground. Without mitigation this could have a moderate adverse effect on water quality.
Diffuse Pollution Contained in Fire Water Runoff	Given the nature of the Scheme there is a potential risk of fire which may negatively effect upon the local water environment. Runoff from the Scheme, along with the associated infrastructure, following a fire could contain diffuse urban pollutants such as hydrocarbons, heavy metals, as well as debris and

	silt which could ultimately be discharged to the nearby watercourses via surface water runoff or infiltrate to ground. Without mitigation this could have a moderate adverse effect on water quality.
Increase in Highway Routine Runoff	Traffic on existing roads to and from the Scheme will increase albeit negligibly as a result of the Scheme. Any increase in traffic flows could lead to the introduction of new sources (or changed discharges) of highway runoff into receiving watercourses. Surface water runoff from roads can contain pollutants such as hydrocarbons, heavy metals and inert particulates which can cause chronic pollution of the water environment if allowed to enter watercourses without the appropriate treatment.
Increase in Highway Spillage Risk	Spillages of pollutants (e.g. oil) on highways can be transported to watercourses via runoff, where they could impact upon ecological life, or infiltrate to ground.
Increased Demand on Water Supply	Due to the nature of the Scheme there is no demand for water. This is not directly considered to be a surface water quality effect, as it is unlikely that any required water would be sourced from local surface waters, and it is presumed that the Scheme would not proceed unless potable water was available from elsewhere.. Water consumption for any future Site users should be minimised through water efficiency measures.
Disposal of Surface and Foul Water from the Scheme	Access to the solar PV array during construction and operation will be taken from grassed/permeable tracks and existing farm tracks accessed from the wider highway network, limiting the requirement for new hardstanding.

8.0 Mitigation

8.1 Embedded Mitigation

8.1.1 Cognisant of the WFD requirements and the potential significant effects of the development on the environment the following measures have been identified and adopted within the Scheme design and are considered to be embedded mitigation.

- 8m easements have been established around all watercourses, including Main Rivers and Ordinary Watercourses and 9 m from IDB assets.
- Beyond this, the separation of construction/decommissioning groundworks from drainage ditches has been maximised, particularly from the IDB maintained ditches onsite.
- Existing access tracks, where possible, will be retained, limiting the requirement to develop new access which can disturb soils and lead to compaction. Where new access tracks are required they have been designed to avoid crossing drainage ditches, where possible.
- The Outline Construction Environment Management Plan (CEMP) accompanying the application, describes water management measures to control surface water run-off and drain hardstanding and other structures during the construction, operation and decommissioning of the Scheme. This will form part of a Pollution Prevention Plan (PPP) to be implemented for the Scheme.
- The easements embedded into the design for watercourses, in conjunction with the CEMP, will avoid potential effects on the local receptors. However where the cable route cannot avoid crossing of watercourses Horizontal Directional Drilling Techniques will be employed. This is addressed in the Crossing Schedule [EN010133/APP/C7.17].
    - HDD techniques will require a launch pit to be excavated at the starting point for the machinery to drill from, to a 'reception pit' to be excavated at the end point where the machinery will drill to. These launch pits and reception pits will be up to 2m deep, 8m in length and 4m wide. Both launch and reception pits will be a minimum distance of 10m from a watercourse and will be backfilled and reinstated following installation of the cables. The precise location and dimensions of the launch and reception pits will be determined during detailed design.
- Access to the Scheme during construction, operation and decommissioning will be taken from permeable and existing farm tracks accessed from the local highway network. This limits the potential for increased surface water runoff rates and sedimentation effects during construction / decommissioning.

8.2 Mitigation Measures

8.2.1 Table 10.5 below details the mitigations incorporated into the scheme to mitigate the potential Significant impacts.

Table 10.5: Summary of likely significant effects and receptors at risk if left unmitigated

Likely Significant Effect	**Mitigation**
Construction / Decommissioning Phase	
Mud and Debris Blockages	Where necessary a temporary drainage network will be installed prior to the commencement of construction and a robust maintenance plan, confirmed through a Construction Environmental Management Plan (CEMP), should be maintained throughout the duration of construction works on the Scheme.

	This is a precautionary and safeguarding approach to reduce the risk to the workers and help reduce the likelihood of the above significant effects. Similarly, during decommissioning a Decommissioning Environmental Management Plan (DEMP), should be maintained. An Outline Construction Environment Management Plan [EN010133/APP/C7.1] and Outline Decommissioning Statement [EN010133/APP/C7.2] are submitted in support of the DCO application. Following the implementation of mitigation measures the residual effect of mud and debris entering the surface water / land drainage system is considered Negligible.
Temporary Increase in Impermeable Area	Construction mitigation guidance should be adhered to, for example ensuring that the impermeable area on the Scheme is increased as little as possible and where necessary installing a temporary surface water drainage system during construction. This effect should lessen as the Scheme progresses and the overall impermeable area increases with surface water drainage networks installed to deal with this effect. The residual effect, following the implementation of a temporary construction / Decommissioning drainage network, is considered to be Negligible.
Compaction of Soils	Construction mitigation guidance should be adhered to, for example ensuring that heavy equipment is only used where necessary to avoid ground compaction. Topsoil should be cultivated in-line with BS 3882: 2015 to a minimum depth of 400mm over all planting areas or to a fine tilth over all areas to be seeded and include basic levelling with levels graded to fall. No cultivation should take place in wet/ waterlogged conditions and within the root protection areas of existing trees as defined by BS5837:2012. Where necessary, imported topsoil should be sustainably sourced and must be compliant with the BS 3882: 2015. The residual effect, following the implementation of a temporary construction / Decommissioning works, is considered to be Negligible.
Silt-laden Runoff	The following mitigation measures will be incorporated into the CEMP and DEMP for silt management and control: • Works that are likely to generate silt-laden runoff (e.g. earthworks and excavations) will be done preferentially during the drier months of the year; • During the construction / decommissioning phases, ideally easements of 10 m (where possible) should be preserved adjacent to all receptors to ensure that there is a sufficient buffer from the sensitive receptor to the construction stages of development; • Site compounds and stockpiles will be located as far as possible (ideally at least 30 m) away from receptors; • A drainage system will be developed to prevent silt-laden runoff from entering surface water drains, watercourses and ponds without treatment (e.g. earth bunds, silt fences, straw bales, or proprietary treatment) under any circumstances; • Earth stockpiles will be seeded as soon as possible, covered with geotextile mats or surrounding by a bund;

	• Mud will be controlled at entry and exits to the Site using wheel washes and / or road sweepers; • Tools and plant will be washed out and cleaned in designated areas within Site compound where runoff can be isolated for treatment before discharge to watercourse under appropriate consent; • Debris and other material will be prevented from entering receptors; and • Construction / decommissioning SuDS (such as temporary attenuation) to be used during construction / decommissioning if necessary. Following the implementation of mitigation measures the residual effect is considered to be Negligible.
Spillages, Leakages and Pollutants	Measures to control the storage, handling and disposal of chemicals, fuels/oils and other substances will need to be put in place prior to and during construction / decommissioning. The following key mitigation measures relating to the control of spillages and leaks have been included in the CEMP. • Fuel will be stored and used in accordance with the Control of Substances Hazardous to Health Regulations 2002, and the Control of Pollution (Oil Storage) (England) Regulations 2001; • Fuel and other potentially polluting chemicals are to be stored in a secure impermeable and bunded area; • Refuelling of plant to take place off the Site if possible, or only in a designated area at the Site compound ideally at least 20 m from receptors; • Any plant / machinery / vehicles will be regularly inspected and maintained to ensure they are in good working order and clean for use in a sensitive environment. This maintenance is to take place off the Site if possible or only at designated areas in the Site compound; • All fixed plant used on the Site to be self-bunded; • Mobile plant to be in good working order, kept clean and fitted with drip trays where appropriate; • An Emergency Response Plan will be prepared and included in the CEMP. Spill kits and oil absorbent material to be carried by mobile plant and located at vulnerable locations on the Site. Construction workers will receive spill response training; • The Site is to be kept secure to prevent vandalism that could lead to a pollution incident; • Construction / decommissioning waste / debris are to be prevented from entering any water body; • Surface water drains on roads, other watercourse crossings or the core scheme compound area will be identified and where there is a risk that silt laden runoff could enter them they will be protected (e.g. covers or sand bags); and • Concrete wash water will be adequately contained and removed from the Site. Following the implementation of the mitigation measures the residual effect is considered to be Negligible.

Inappropriate Wastewater Disposal from Welfare Facilities	In the absence of nearby public foul water sewers to which foul water from welfare facilities could be connected, suitably sized self-contained welfare should be provided by a specialist Contractor.
Operational Phase	
Increase in Permanent Impermeable Area	Given the nature of the Scheme, the increase of permanent impermeable area on the Scheme will be negligible, however equipment such as the proposed substations and battery / energy storage areas will generate increased surface water runoff when compared to the current undeveloped nature of the Scheme. There can be no off-site detriment in terms of surface water runoff rates and volumes and therefore it is proposed to maintain the predevelopment surface water regime post development. This will be achieved through: • Utilising permeable surfacing (Type 2 aggregate) for the Site access, ensuring that surface water is retained where it falls and is allowed to infiltrate to subsoils as per the existing situation. • Installation of linear infiltration trenches around Critical infrastructure (the substations and energy storage compounds) or any other required hardstanding such as concrete bases. Infiltration trenches will ensure that any surface water generated by hardstanding is retained adjacent to the infrastructure, allowing it to infiltrate to subsoils as per the existing situation. • The solar panels have the potential to concentrate rainfall under the leeward edge of the panels themselves. Research in the United States by Cook & McCuen , suggested this increase would not be significant however, there is a potential increase in silt ladened runoff. With the implementation of suitable planting (such as a wildflower or grass mix) the underlying ground cover is strengthened and is unlikely to generate surface water runoff rates beyond the baseline scenario.
Increase in Discharge to Local Watercourses.	Maintaining the existing surface water run-off regime by utilising permeable surfacing for the Site access, linear infiltration trenches around any proposed infrastructure (substations and batteries) and wildflower planting at the leeward edge of solar panels will ensure that the Scheme is unlikely to generate surface water runoff rates beyond the baseline scenario. The management train of any proposed SuDS will be designed appropriately so as not to exacerbate surface water risk from the Scheme. Suitability of the SuDS components will be determined in the detailed drainage design for the Scheme.
Diffuse Pollution Contained in Urban Runoff	The Scheme is likely to have a very-low pollution risk and so the management train should normally have one or two treatment stages. Generally, two treatment stages for run-off from access and one treatment stage for run-off from roofs are sufficient. Where practical, at detailed design stage runoff from equipment and access tracks will be directed to permeable SuDS features with contributions being made from permeable surfacing, wildflower planting and linear infiltration trenches. Inclusion of aforementioned features would provide sufficient treatment. An overview of possible SuDS features and possible future maintenance are provided in the Drainage Strategy sections of the Flood Risk Assessment and Drainage Strategy included as Appendix 10.1 and the supporting Annexes.

Diffuse Pollution Contained in Fire Water Runoff	Given the nature of the energy storage within the scheme, there is a potential risk of fire which could result in the mobilisation of pollution within surface water run-off. Where practical, at detailed design stage it is recommended that runoff from the energy storage area will be contained by local bunding and attenuated within gravel subgrade of lined permeable SuDS features prior to being passed forward to the local land drainage network. In the event of a fire a system of automatically self-actuating valves at the outfalls from the battery storage areas will be closed, isolating the battery storage areas drainage from the wider environment. The water contained by the valves will be tested and either treated and released or tankered off-site as necessary and in consultation with the relevant consultees at the time. Local fire water provision has also been provided adjacent to the battery storage sites as requested by the fire department. Inclusion of aforementioned features should provide sufficient mitigation should a fire event occur. An overview of possible SuDS features and possible future maintenance are provided in the Drainage Strategy sections of the Flood Risk Assessment and Drainage Strategy included as Appendix 10.1 and the supporting Annexes.
Increase in Highway Routine Runoff	No mitigation required beyond what is proposed in ES Chapter 14 Transport and Access [EN010133/APP/C6.2.14] is required. Mitigation may include adaptations porous surfacing or similar; this would be confirmed at detailed design.
Increase in Highway Spillage Risk	
Increased Demand on Water Supply	The increased demand on water supply from the Scheme is considered to have an effect of Negligible magnitude (i.e. to locations where potable water supply is obtained from). The significance of effect is therefore Negligible.
Disposal of Surface and Foul Water from the Scheme	Currently there is no known existing foul network on the Scheme or adjacent. Waste water associated with welfare facilities at the substations will be contained in a septic tank to be emptied as and when required by tanker as there will be no foul drainage network associated with the Site.

8.2.2 The method by which the proposed mitigation measures are secured are summarised as Table 10.7 below.

Table 10.7: Mitigation

Ref	**Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects**	**How measure would be secured**	
		By Design	**By DCO Requirement**
	Maintaining the existing surface water run-off regime by utilising permeable surfacing for the Scheme access, linear infiltration trenches around any proposed infrastructure (substations and batteries) and wildflower planting at the leeward edge of solar panels	X	

	Where necessary install temporary drainage network prior to the commencement of construction / decommissioning and robust maintenance plan should be maintained throughout the duration of construction works on the Scheme.		X
	Any proposed drainage features such as permeable surfacing, infiltration trenches and wildflower planting should be designed to good practice standards and a robust maintenance plan should be implemented.	X	X
	Include silt management and control measures in the CEMP.		X
	Ensure measures to control the storage, handling and disposal of pollutants are put in place prior to and during construction included in the CEMP and during decommissioning in the DEMP.		X

9.0 Summary and Conclusions

9.1.1 This WFD Assessment has assessed the potential significant impacts of the proposed works associated with the Scheme against the WFD parameters, including the methods used to assess the effects; the baseline conditions currently existing at the Scheme and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.

9.1.2 In summary, the main potential significant effects to the WFD waterbodies at the Scheme revolve around managing surface water risk at the Scheme and the potential for silt laden runoff, spillages, leaks and pollutants during the construction / decommissioning stage and diffuse pollution contained in urban runoff during the operation phase from a water quality / resource perspective.

9.1.3 Mitigation includes completion of a CEMP and DEMP which will include details of mitigation measures to prevent adverse impacts occurring to controlled waters and simple SuDS measures to mitigate the surface water risk. Generally, the Scheme is likely to have a very low pollution risk and so the management train should normally have one or two treatment stages to mitigate this.

9.1.4 Inclusion of permeable surfacing for the Scheme access, linear infiltration trenches around any proposed infrastructure (substations and batteries) and wildflower planting at the leeward edge of solar panels should in general provide sufficient treatment as well as the attenuation required to maintain existing runoff rates.

9.1.5 The Scheme would be acceptable with the mitigation measures identified which would ensure there would be no significant effects.

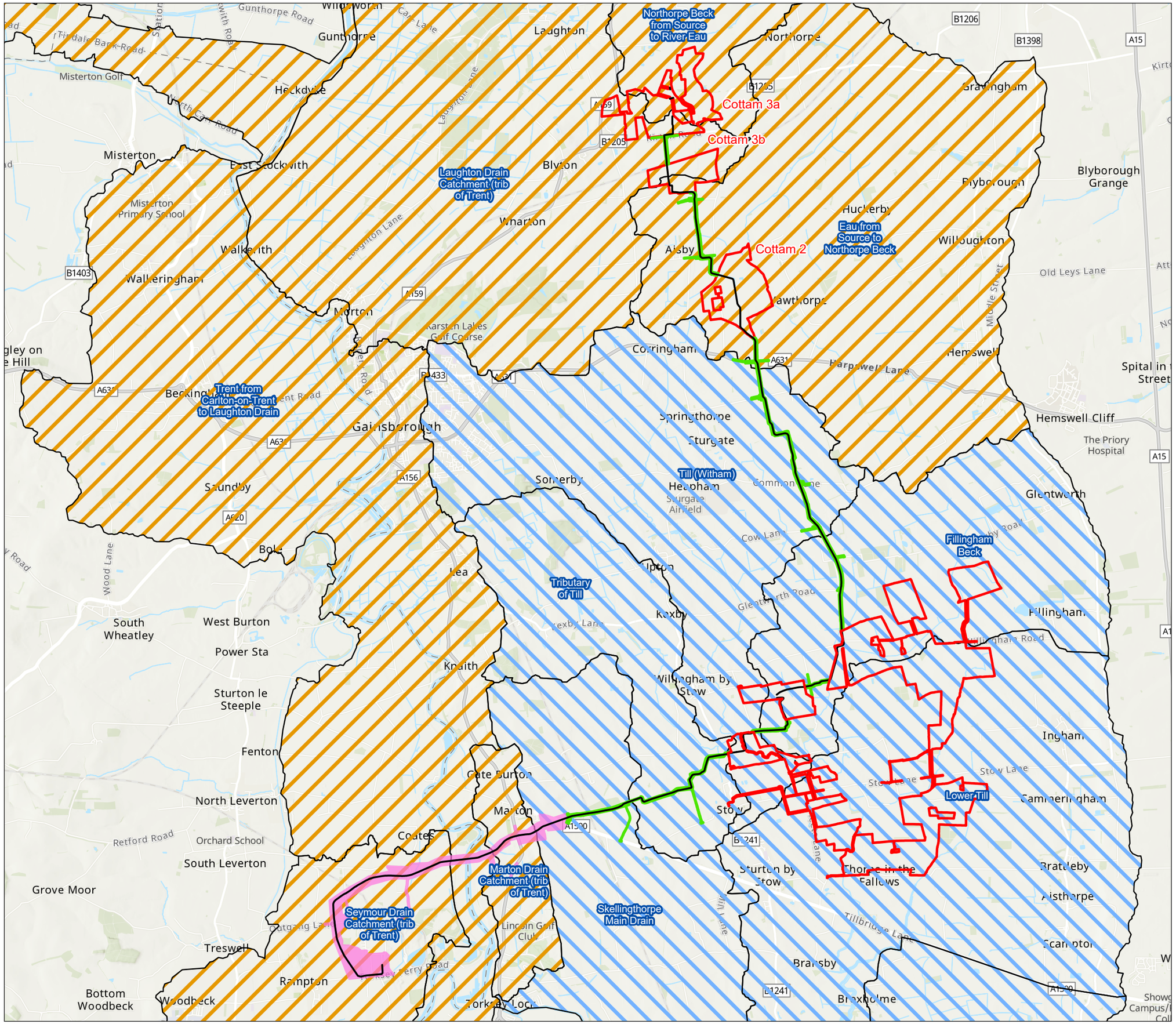
Appendix A – Limitations

Limitations

The recommendations contained in this Report represent Delta-Simons professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant.

Delta-Simons obtained, reviewed and evaluated information in preparing this Report from the Client and others. Delta-Simons conclusions, opinions and recommendations has been determined using this information.

Appendix B – WFD Surface Water Body Map



Legend

- Site boundary
- WFD River Water Body Catchments Cycle 2 2019 (Trent and Trib)
- WFD River Water Body Catchments Cycle 2 2019 (Witham Upper)
- Shared cable corridor and access
- High voltage cable corridor and access
- Cable route

Figure	WFD Surface Waterbody Catchments		
Job	Cottam		
Client	Island Green Power		
Annex: C	Revision: A	Date: 06/01/2023	
Drawn: BB	Checked: JR	Scale: 1:70,000 @ A3	
Job No.: 21-1088.01		Central GR: 485466E 387794N	

DO NOT SCALE.
NOT FOR CONSTRUCTION.

DeltaSimons

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Appendix C – Tabulated WFD Status

Classification Item	Cycle 2 2016 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Biological quality elements	Good	Moderate	Good	2015	
Invertebrates	Good	Good	Good	2015	
Macrophytes and Phytobenthos Combined	Good	Moderate	Good	2015	
Physico-chemical quality elements	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Ammonia (Phys-Chem)	High	Good	Good	2015	
Dissolved oxygen	High	High	Good	2015	
Phosphate	Poor	Poor	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Temperature	High	High	Good	2015	
pH	High	High	Good	2015	
Hydromorphological Supporting Elements	Supports good	Supports good	Supports good	2015	
Hydrological Regime	High	High	Supports good	2015	
Supporting elements (Surface Water)	N/A		Not assessed	2015	
Specific pollutants	N/A		Not assessed	2015	
Chemical	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority hazardous substances	Does not require assessment	Fail	Good	2063	Natural conditions: Chemical status recovery time
Benzo(a)pyrene		Good	Good	2015	
Dioxins and dioxin-like compounds		Good	Good	2015	
Heptachlor and cis-Heptachlor epoxide		Good	Good	2015	
Hexabromocyclododecane (HBCDD)		Good	Good	2015	
Hexachlorobenzene		Good	Good	2015	

Hexachlorobutadiene		Good	Good	2015	
Mercury and Its Compounds		Fail	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)		Good	Good	2015	
Polybrominated diphenyl ethers (PBDE)		Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority substances	Does not require assessment	Good	Good	2015	
Cypermethrin (Priority)		Good	Good	2015	
Fluoranthene		Good	Good	2015	
Other Pollutants	Does not require assessment	Does not require assessment	Does not require assessment	2015	

Classification Item	Cycle 3 2019 Classification	Cycle 3 Objectives		
	Status	Status	Year	Reasons
Ecological	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens; Good status prevented by A/HMWB designated use: Action to get biological element to good would have significant adverse impact on use
Biological quality elements	Moderate	Moderate	2015	Disproportionately expensive: Disproportionate burdens; Good status prevented by A/HMWB designated use: Action to get biological element to good would have significant adverse impact on use
Invertebrates	Moderate	Moderate	2015	Good status prevented by A/HMWB designated use: Action to get biological element to good would have significant adverse impact on use
Macrophytes and Phytobenthos Combined		Not assessed	2015	Disproportionately expensive: Disproportionate burdens
Physico-chemical quality elements	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Ammonia (Phys-Chem)	High	Good	2015	
Dissolved oxygen	High	Good	2015	
Phosphate	Poor	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Temperature	High	Good	2015	
pH	High	Good	2015	
Hydromorphological Supporting Elements	Supports good	Supports good	2015	
Hydrological Regime	Supports good	Supports good	2015	
Supporting elements (Surface Water)	Good	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Mitigation Measures Assessment	Good	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Specific pollutants		Not assessed	2015	
Chemical	Good	Good	2063	Natural conditions: Chemical status recovery time

Priority hazardous substances	Does not require assessment	Good	2063	Natural conditions: Chemical status recovery time
Benzo(a)pyrene		Good	2015	
Dioxins and dioxin-like compounds		Good	2015	
Heptachlor and cis-Heptachlor epoxide		Good	2015	
Hexabromocyclododecane (HBCDD)		Good	2015	
Hexachlorobenzene		Good	2015	
Hexachlorobutadiene		Good	2015	
Mercury and Its Compounds		Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)		Good	2015	
Polybrominated diphenyl ethers (PBDE)		Good	2063	Natural conditions: Chemical status recovery time
Priority substances	Does not require assessment	Good	2015	
Cypermethrin (Priority)		Good	2015	
Fluoranthene		Good	2015	
Other Pollutants	Does not require assessment	Does not require assessment	2015	

Classification Item	Cycle 2 2016 Classification	Cycle 2 2019 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	Moderate	Moderate	Ecological	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Biological quality elements	Moderate	Moderate	Biological quality elements	Moderate	2015	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Invertebrates	Moderate	Moderate	Invertebrates	Moderate	2015	Disproportionately expensive: Unfavourable balance of costs and benefits
Macrophytes and Phytobenthos Combined	Moderate	Moderate	Macrophytes and Phytobenthos Combined	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens

Macrophytes Sub Element	High	High	Physico-chemical quality elements	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Phytobenthos Sub Element	Moderate	Moderate	Acid Neutralising Capacity	Good	2015	
Physico-chemical quality elements	Moderate	Moderate	Ammonia (Phys-Chem)	Good	2015	
Acid Neutralising Capacity	High	High	Dissolved oxygen	Good	2015	
Ammonia (Phys-Chem)	Good	High	N/A	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Biochemical Oxygen Demand (BOD)	High		N/A	Good	2015	
Dissolved oxygen	Moderate	Poor	Phosphate	Good	2015	
Phosphate	Poor	Poor	Temperature	Supports good	2015	
Temperature	High	High	pH	Supports good	2015	
pH	High	High	Hydromorphological Supporting Elements	Good	2015	
Hydromorphological Supporting Elements	Supports good	Supports good	Hydrological Regime	Good	2015	
Hydrological Regime	Supports good	Supports good	Supporting elements (Surface Water)	Not assessed	2015	
Supporting elements (Surface Water)	Good	Good	Mitigation Measures Assessment	Good	2063	Natural conditions: Chemical status recovery time
Mitigation Measures Assessment	Good	Good	Specific pollutants	Good	2063	Natural conditions: Chemical status recovery time

Chemical	Good	Fail	Chemical	Good	2015	
Priority hazardous substances	Does not require assessment	Fail	Priority hazardous substances	Good	2015	
Benzo(a)pyrene		Good	Benzo(a)pyrene	Good	2015	
Dioxins and dioxin-like compounds		Good	Dioxins and dioxin-like compounds	Good	2015	
Heptachlor and cis-Heptachlor epoxide		Good	Heptachlor and cis-Heptachlor epoxide	Good	2015	
Hexabromocyclododecane (HBCDD)		Good	Hexabromocyclododecane (HBCDD)	Good	2015	
Hexachlorobenzene		Good	Hexachlorobenzene	Good	2040	Natural conditions: Chemical status recovery time
Hexachlorobutadiene		Good	Hexachlorobutadiene	Good	2015	
Mercury and Its Compounds		Fail	Mercury and Its Compounds	Good	2063	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)		Good	Perfluorooctane sulphonate (PFOS)	Good	2015	
Polybrominated diphenyl ethers (PBDE)		Fail	Polybrominated diphenyl ethers (PBDE)	Good	2015	
Priority substances	Does not require assessment	Good	Priority substances	Good	2015	
Cypermethrin (Priority)		Good	Cypermethrin (Priority)	Does not require assessment	2015	
Fluoranthene		Good	Fluoranthene			
Other Pollutants	Does not require assessment	Does not require assessment	Other Pollutants			

Classification Item	Cycle 2 2016 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Biological quality elements	Good	Good	Good	2015	
Invertebrates	Good	Good	Good	2015	
Macrophytes and Phytobenthos Combined			Not assessed	2015	
Physico-chemical quality elements	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Ammonia (Phys-Chem)	High	High	Good	2015	
Dissolved oxygen	Good	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Phosphate	Moderate	Good	Good	2021	Disproportionately expensive: Disproportionate burdens
Temperature	High	High	Good	2015	
pH	High	High	Good	2015	
Hydromorphological Supporting Elements	Supports good	Supports good	Supports good	2015	
Hydrological Regime	Supports good	Supports good	Supports good	2015	
Supporting elements (Surface Water)	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Mitigation Measures Assessment	Moderate or less	Moderate or less	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Specific pollutants			Not assessed	2015	
Arsenic					
Chlorothalonil					
Chromium (VI)					
Copper					
Iron					
Manganese					
Pendimethalin					
Zinc					
Chemical	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority hazardous substances	Does not require assessment	Fail	Good	2063	Natural conditions: Chemical status recovery time
Benzo(a)pyrene		Good	Good	2015	
Dioxins and dioxin-like compounds		Good	Good	2015	
Heptachlor and cis-Heptachlor epoxide		Good	Good	2015	
Hexabromocyclododecane (HBCDD)		Good	Good	2015	
Hexachlorobenzene		Good	Good	2015	
Hexachlorocyclohexane			Good	2015	
Mercury and Its Compounds		Fail	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)		Good	Good	2015	
Polybrominated diphenyl ethers (PBDE)		Fail	Good	2063	Natural conditions: Chemical status recovery time

Priority substances	Does not require assessment	Good	Good	2015	
Cypermethrin (Priority)		Good	Good	2015	
Fluoranthene		Good	Good	2015	
Other Pollutants	Does not require assessment	Does not require assessment	Does not require assessment	2015	

Classification Item	Cycle 2 2016 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	Moderate	Moderate	Good	2015	
Biological quality elements	Moderate	Moderate	Good	2015	
Invertebrates	Good	Good	Good	2015	
Macrophytes and Phytobenthos Combined	Moderate	Moderate	Good	2015	
Physico-chemical quality elements	Good	Good	Good	2015	
Ammonia (Phys-Chem)	High	High	Good	2015	
Dissolved oxygen	Good	Good	Good	2015	
Phosphate	Good	High	Good	2015	
Temperature	High	High	Good	2015	
pH	High	High	Good	2015	
Hydromorphological Supporting Elements	Supports good	Supports good	Supports good	2015	
Hydrological Regime	High	High	Supports good	2015	
Supporting elements (Surface Water)	NA	NA	Not assessed	2015	
Mitigation Measures Assessment	NA	NA	NA		
Specific pollutants	NA	NA	Not assessed	2015	
Arsenic	NA	NA	NA		
Chlorothalonil	NA	NA	NA		
Chromium (VI)	NA	NA	NA		
Copper	NA	NA	NA		
Iron	NA	NA	NA		
Manganese	NA	NA	NA		
Pendimethalin	NA	NA	NA		
Zinc	NA	NA	NA		
Chemical	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority hazardous substances	Does not require assessment	Fail	Good	2063	Natural conditions: Chemical status recovery time
Benzo(a)pyrene	NA	Good	Good	2015	
Dioxins and dioxin-like compounds	NA	Good	Good	2015	
Heptachlor and cis-Heptachlor epoxide	NA	Good	Good	2015	

Hexabromocyclododecane (HBCDD)	NA	Good	Good	2015	
Hexachlorobenzene	NA	Good	Good	2015	
Hexachlorocyclohexane	NA	Good	Good	2015	
Mercury and Its Compounds	NA	Fail	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)	NA	Good	Good	2015	
Polybrominated diphenyl ethers (PBDE)	NA	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority substances	Does not require assessment	Good	Good	2015	
Cypermethrin (Priority)	NA	Good	Good	2015	
Fluoranthene	NA	Good	Good	2015	
Other Pollutants	Does not require assessment	Does not require assessm	Does not require assessme	2015	

Classification Item	Cycle 2 2016 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Biological quality elements	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Invertebrates	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Macrophytes and Phytobenthos Combined			Not assessed	2015	Disproportionately expensive: Disproportionate burdens
Physico-chemical quality elements	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Ammonia (Phys-Chem)	High	High	Good	2015	
Dissolved oxygen	Poor	Poor	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Phosphate	Poor	Poor	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Temperature	High	High	Good	2015	
pH	High	High	Good	2015	
Hydromorphological Supporting Elements	Supports good	Supports good	Supports good	2015	
Hydrological Regime	Supports good	Supports good	Supports good	2015	
Supporting elements (Surface Water)	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Mitigation Measures Assessment	Moderate or less	Moderate or less	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Specific pollutants	High	High	High	2015	
Arsenic	High	High	High	2015	
Chlorothalonil					
Chromium (VI)		High	High	2015	
Copper	High	High	High	2015	
Iron	High	High	High	2015	
Manganese	High	High	High	2015	
Pendimethalin	High	High			
Zinc	High	High	High	2015	
Chemical	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority hazardous substances	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time
Benzo(a)pyrene	Good	Good	Good	2015	
Dioxins and dioxin-like compounds		Good	Good	2015	
Heptachlor and cis-Heptachlor epoxide		Good	Good	2015	
Hexabromocyclododecane (HBCDD)		Good	Good	2015	
Hexachlorobenzene		Good	Good	2015	
Hexachlorocyclohexane					
Mercury and Its Compounds	Good	Fail	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)		Good	Good	2015	
Polybrominated diphenyl ethers (PBDE)	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority substances	Good	Good	Good	2015	
Cypermethrin (Priority)		Good	Good	2015	
Fluoranthene		Good	Good	2015	

Other Pollutants	Does not require assessment	Does not require assessment	Does not require assessment	2015	

Classification Item	Cycle 2 2016 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	Moderate	Moderate	Moderate	2015	Disproportionately expensive: Disproportionate burdens;Disproportionately expensive: Unfavourable balance of costs and benefits;Technically infeasible: No known technical solution is available
Biological quality elements	Moderate	Moderate	Moderate	2015	Disproportionately expensive: Unfavourable balance of costs and benefits;Technically infeasible: No known technical solution is available
Invertebrates	Moderate	Moderate	Moderate	2015	Disproportionately expensive: Unfavourable balance of costs and benefits;Technically infeasible: No known technical solution is available
Macrophytes and Phytobenthos Combined	NA	NA	Not assessed	2015	
Physico-chemical quality elements	Moderate	Moderate	Moderate	2015	Disproportionately expensive: Disproportionate burdens;Disproportionately expensive: Unfavourable balance of costs and benefits;Technically infeasible: No known technical solution is available
Ammonia (Phys-Chem)	High	High	Good	2015	
Dissolved oxygen	Bad	Bad	Poor	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens;Disproportionately expensive: Unfavourable balance of costs and benefits;Technically infeasible: No known technical solution is available
Phosphate	High	High	Good	2015	
Temperature	High	High	Good	2015	
pH	High	High	Good	2015	
Hydromorphological Supporting Elements	Supports good	Supports good	Supports good	2015	
Hydrological Regime	Supports good	Supports good	Supports good	2015	
Supporting elements (Surface Water)	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Mitigation Measures Assessment	Moderate or less	Moderate or less	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Specific pollutants	NA	NA	Not assessed	2015	
Arsenic	NA	NA	NA	NA	
Chlorothalonil	NA	NA	NA	NA	
Chromium (VI)	NA	NA	NA	NA	
Copper	NA	NA	NA	NA	
Iron	NA	NA	NA	NA	
Manganese	NA	NA	NA	NA	
Pendimethalin	NA	NA	NA	NA	
Zinc	NA	NA	NA	NA	
Chemical	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority hazardous substances	Does not require assessment	Fail	Good	2063	Natural conditions: Chemical status recovery time
Benzo(a)pyrene	NA	Good	Good	2015	
Dioxins and dioxin-like compounds	NA	Good	Good	2015	
Heptachlor and cis-Heptachlor epoxide	NA	Good	Good	2015	
Hexabromocyclododecane (HBCDD)	NA	Good	Good	2015	
Hexachlorobenzene	NA	Good	Good	2015	
Hexachlorocyclohexane	NA		Good	2015	
Mercury and Its Compounds	NA	Fail	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)	NA	Good	Good	2015	
Polybrominated diphenyl ethers (PBDE)	NA	Fail	Good	2063	Natural conditions: Chemical status recovery time

Priority substances	Does not require assessment	Good	Good	2015	
Cypermethrin (Priority)	NA	Good	Good	2015	
Fluoranthene	NA	Good	Good	2015	
Other Pollutants	Does not require assessment	Does not require assessment	Does not require assessment	2015	

Classification Item	Cycle 2 2016 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Biological quality elements	Bad	Bad	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Invertebrates	Bad	Bad	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Macrophytes and Phytobenthos Combined	Good	Good	Good	2015	
Physico-chemical quality elements	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Ammonia (Phys-Chem)	High	High	Good	2015	
Dissolved oxygen	High	High	Good	2015	
Phosphate	Poor	Poor	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Temperature	High	High	Good	2015	
pH	High	High	Good	2015	
Hydromorphological Supporting Elements	Supports good	Supports good	Supports good	2015	
Hydrological Regime	Supports good	Supports good	Supports good	2015	
Supporting elements (Surface Water)	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Mitigation Measures Assessment	Moderate or less	Moderate or less	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Specific pollutants	High	High	High	2015	
Arsenic	High	High	High	2015	
Chlorothalonil		High	High	2015	
Chromium (VI)		High	High	2015	
Copper	High	High	High	2015	
Iron	High	High	High	2015	
Manganese	High	High	High	2015	
Pendimethalin		High	High	2015	
Zinc	High	High	High	2015	
Chemical	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time;Technically infeasible: No known technical solution is available
Priority hazardous substances	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time;Technically infeasible: No known technical solution is available
Benzo(a)pyrene	Good	Good	Good	2015	
Dioxins and dioxin-like compounds		Good	Good	2015	
Heptachlor and cis-Heptachlor epoxide		Good	Good	2015	
Hexabromocyclododecane (HBCDD)		Good	Good	2015	
Hexachlorobenzene		Good	Good	2015	
Hexachlorocyclohexane	Good	Good	Good	2015	

Mercury and Its Compounds	Good	Fail	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)		Fail	Good	2039	Technically infeasible: No known technical solution is available
Polybrominated diphenyl ethers (PBDE)		Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority substances	Good	Good	Good	2015	
Cypermethrin (Priority)		Good	Good	2015	
Fluoranthene	Good	Good	Good	2015	
Other Pollutants	Good	Good	Good	2015	

Classification Item	Cycle 2 2016 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	Poor	Poor	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens;Technically infeasible: Cause of adverse impact unknown
Biological quality elements	Poor	Poor	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens;Technically infeasible: Cause of adverse impact unknown
Invertebrates	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens;Technically infeasible: Cause of adverse impact unknown
Macrophytes and Phytobenthos Combined	Poor	Poor	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens;Technically infeasible: Cause of adverse impact unknown
Physico-chemical quality elements	Moderate	High	Good	2015	
Ammonia (Phys-Chem)	High	High	Good	2015	
Dissolved oxygen	Moderate	High	Good	2015	
Phosphate	High	High	Good	2015	
Temperature	High	High	Good	2015	
pH	High	High	Good	2015	
Hydromorphological Supporting Elements	Supports good	Supports good	Supports good	2015	
Hydrological Regime	High	High	Supports good	2015	
Supporting elements (Surface Water)	NA	NA	Not assessed	2015	
Mitigation Measures Assessment	NA	NA			
Specific pollutants	NA	NA	Not assessed	2015	
Arsenic	NA	NA			
Chlorothalonil	NA	NA			
Chromium (VI)	NA	NA			
Copper	NA	NA			
Iron	NA	NA			
Manganese	NA	NA			
Pendimethalin	NA	NA			
Zinc	NA	NA			
Chemical	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority hazardous substances	Does not require assessment	Fail	Good	2063	Natural conditions: Chemical status recovery time
Benzo(a)pyrene		Good	Good	2015	
Dioxins and dioxin-like compounds	NA	Good	Good	2015	
Heptachlor and cis-Heptachlor epoxide	NA	Good	Good	2015	
Hexabromocyclododecane (HBCDD)	NA	Good	Good	2015	
Hexachlorobenzene	NA	Good	Good	2015	
Hexachlorocyclohexane	NA		Good	2015	
Mercury and Its Compounds	NA	Fail	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)	NA	Good	Good	2015	
Polybrominated diphenyl ethers (PBDE)	NA	Fail	Good	2063	Natural conditions: Chemical status recovery time

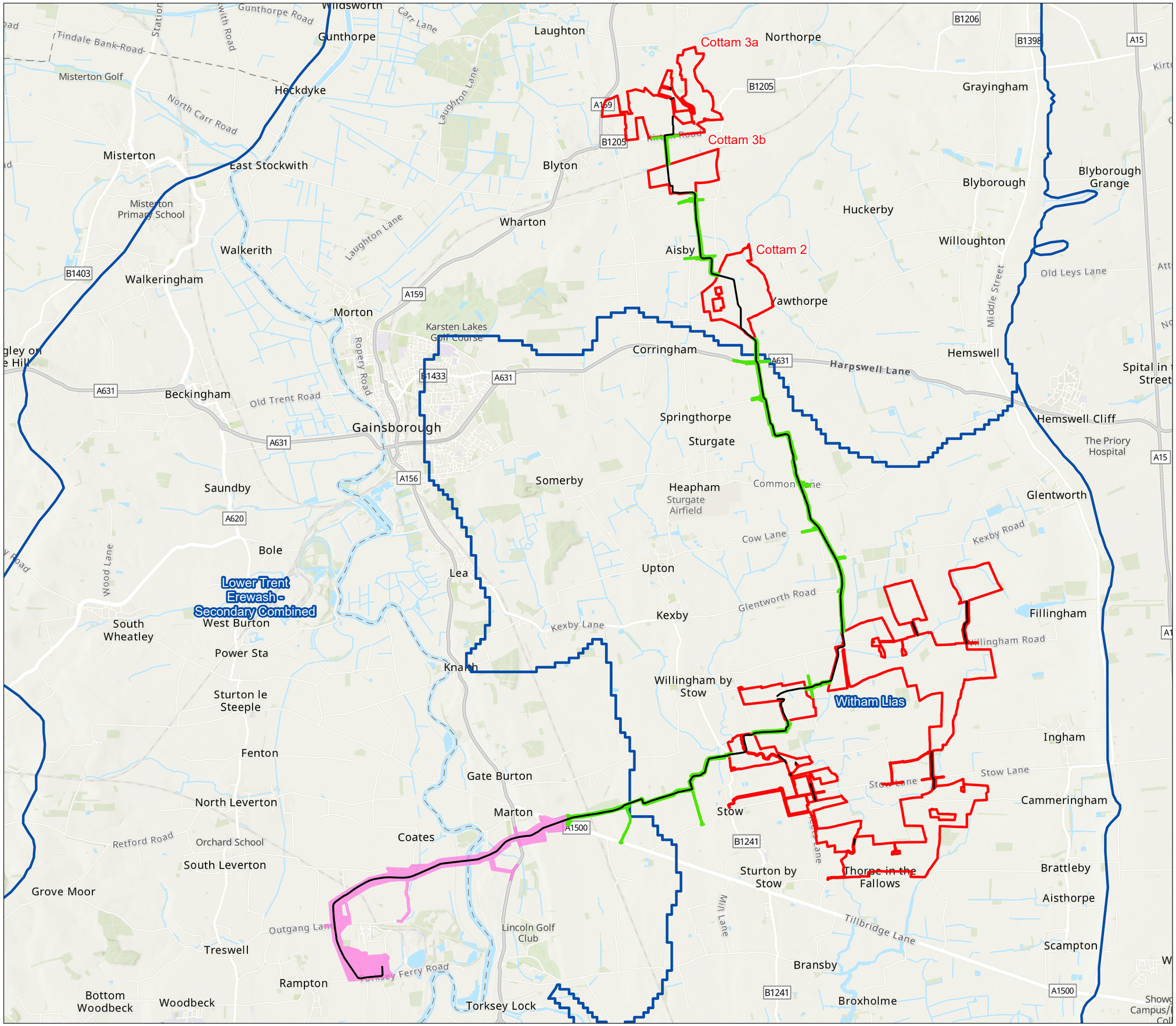
Priority substances	Does not require assessment	Good	Good	2015	
Cypermethrin (Priority)	NA	Good	Good	2015	
Fluoranthene	NA	Good	Good	2015	
Other Pollutants	Does not require assessment	Does not require assessment	Does not require assessment	2015	

Classification Item	Cycle 2 2019 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	N/A	Moderate	Moderate	2015	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Biological quality elements	N/A	Poor	Moderate	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Fish	N/A	Poor	Moderate	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Invertebrates	N/A	Good	Good	2015	
Macrophytes and Phytobenthos Combined	N/A		Not assessed	2015	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Physico-chemical quality elements	N/A	Moderate	Moderate	2015	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Acid Neutralising Capacity	N/A	High	Good	2015	
Ammonia (Phys-Chem)	N/A	High	Good	2015	
Dissolved oxygen	N/A	Poor	Good	2015	
Phosphate	N/A	Poor	Moderate	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Temperature	N/A	High	Good	2015	
pH	N/A	High	Good	2015	
Hydromorphological Supporting Elements	N/A	Supports good	Supports good	2015	
Hydrological Regime	N/A	Supports good	Supports good	2015	

Supporting elements (Surface Water)	N/A	Good	Good	2015	
Mitigation Measures Assessment	N/A	Good	Good	2015	
Specific pollutants	N/A	High	High	2015	
Copper	N/A	High	High	2015	
Mecoprop	N/A	High	High	2015	
Chemical	N/A	Fail	Good	2063	Natural conditions: Chemical status recovery time; Technically infeasible: No known technical solution is available
Priority hazardous substances	N/A	Fail	Good	2063	Natural conditions: Chemical status recovery time; Technically infeasible: No known technical solution is available
Benzo(a)pyrene	N/A	Good	Good	2015	
Dioxins and dioxin-like compounds	N/A	Good	Good	2015	
Heptachlor and cis-Heptachlor epoxide	N/A	Good	Good	2015	
Hexabromocyclododecane (HBCDD)	N/A	Good	Good	2015	
Hexachlorobenzene	N/A	Good	Good	2015	
Hexachlorobutadiene	N/A	Good	Good	2015	
Mercury and Its Compounds	N/A	Fail	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)	N/A	Fail	Good	2039	Technically infeasible: No known technical solution is available
Polybrominated diphenyl ethers (PBDE)	N/A	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority substances	N/A	Good	Good	2015	
Cypermethrin (Priority)	N/A	Good	Good	2015	
Fluoranthene	N/A	Good	Good	2015	

Other Pollutants	N/A	Does not require assessment	Does not require assessment	2015	

Appendix D – WFD Ground Water Body Map



Legend

- Site boundary
- WFD Groundwater Bodies Cycle 2 intersect cable
- Shared cable corridor and access
- High voltage cable corridor and access
- Cable route

0 1,000 2,000 3,000 Meters

N

Figure	WFD Surface Waterbody Catchments		
Job	Cottam		
Client	Island Green Power		
Annex: D	Revision: A	Date: 06/01/2023	
Drawn: BB	Checked: JR	Scale: 1:70,000 @ A3	
Job No.: 21-1088.01		Central GR: 485466E 387794N	

DO NOT SCALE.
NOT FOR CONSTRUCTION.

DeltaSimons

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