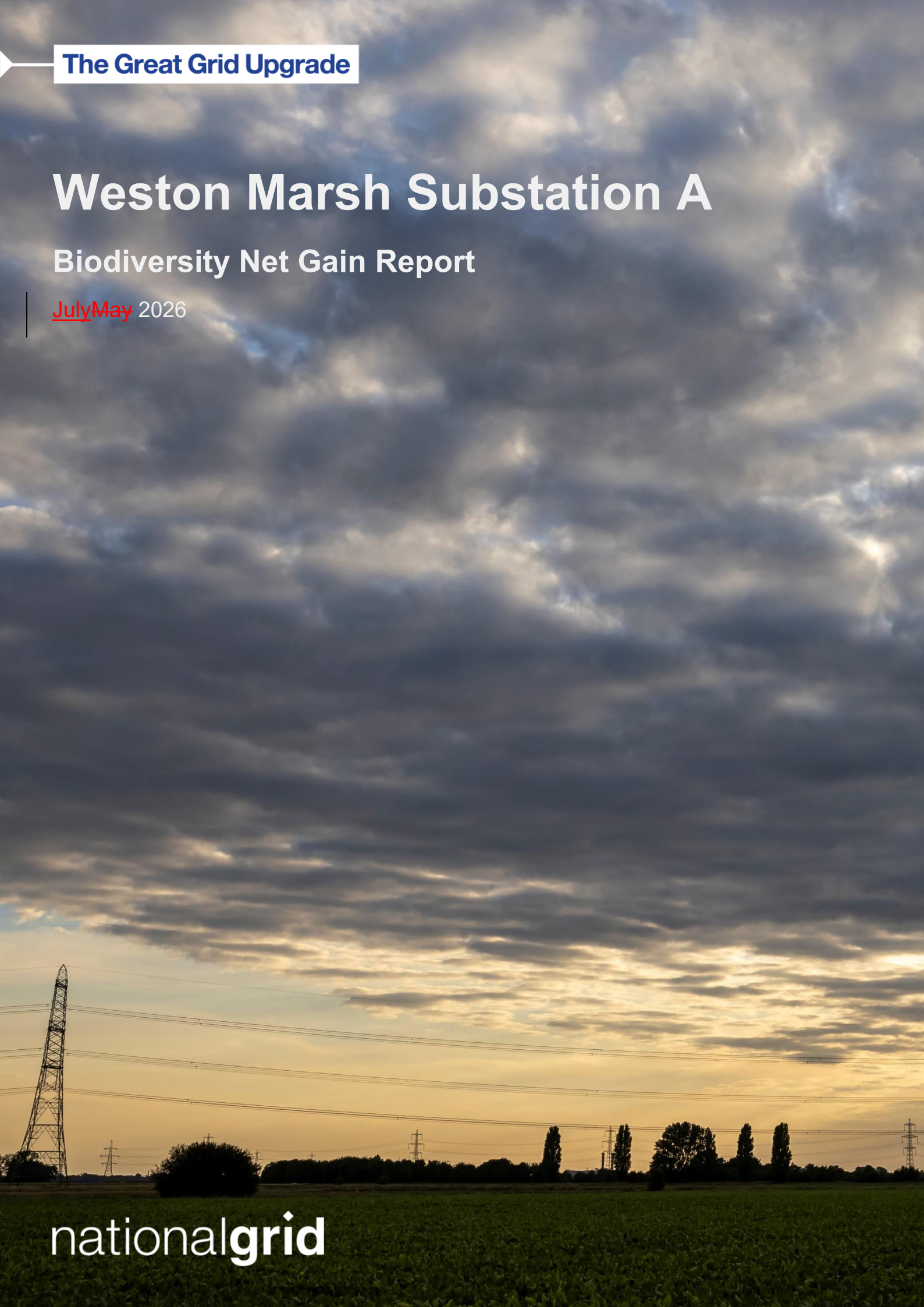
The Great Grid Upgrade

Weston Marsh Substation A

Biodiversity Net Gain Report

July~~May~~ 2026



nationalgrid

Weston Marsh Substation A
Document Control

Document Properties	
Organisation	Arup AECOM
Approved by	National Grid
Title	Biodiversity Net Gain Report
Document Register ID	GWNC-ARU-SS50-XXXXXX-RPT-ES-000015
Data Classification	Public

Version History

Document	Version	Status	Description / Changes
May 2026	1.0	Final	First Issue
July~~ne~~ 2026	1.1	Final	Minor updates following feedback received from TCPA responses

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1. Introduction

1.1 Overview

1.1.1 This Biodiversity Net Gain Report has been prepared on behalf of National Grid Electricity Transmission plc (National Grid).

1.1.2 National Grid ~~are~~is proposing to undertake works to construct a new electricity substation, new sections of overhead line and modification of existing overhead lines west of the Spalding Tee-Point, within the administrative boundary of South Holland District Council (SHDC) in Lincolnshire.

1.2 Summary of the Scheme

1.2.1 In totality, the Scheme consists of four components, each planned to be progressed via separate consenting routes. These are summarised in **Table 1.1**.

Table 1.1 Components of the Scheme

Works Required	Consenting Regime
Construction of the new Air Insulated Substation (AIS) – 400 kV Weston Marsh Substation A, associated landscaping and environmental mitigation works, drainage, highways and other associated works	Town and Country Planning Act 1990 (TCPA) (Ref 1) Component referred to as the '**Substation Works'**
Construction of new sections of overhead line to connect the new substation into the existing 4ZM overhead line Removal of a section of the existing 4ZM overhead line Other associated works	Section 37 (S37) of the Electricity Act 1989 and deemed consent pursuant to section 90(2) of the Town and Country Planning Act 1990 (Ref 2~~Ref 2~~) Component referred to as '**4ZM Overhead Line Works**'
Construction of a new section of overhead line to connect the existing 2WS overhead line into the new substation. Removal of a section of the existing 2WS overhead line Other associated works	S37 of the Electricity Act 1989 and deemed consent pursuant to section 90(2) of the Town and Country Planning Act 1990 (Ref 2) Component referred to as '**2WS Overhead Line Works**'
Reconductoring works required on the existing 4ZM overhead line Two spans of temporary overhead lines	The Town and Country Planning (General Permitted Development) (England) Order 2015~~/~~ (Ref 3) and The Overhead Lines (Exemption) (England and Wales) Regulations 2009 (Ref 4) Component referred to as '**Exempt Overhead Line Works'**

1.2.2 The Substation Works will require consent from SHDC under the Town and Country Planning Act 1990 (Ref 1).

1.2.3 The 4ZM Overhead Line Works and 2WS Overhead Line Works (collectively referred to as 'the S37 Overhead Line Works') (Ref 4) will require consent from the Secretary of State for Energy Security and Net Zero under S37 of the Electricity Act 1989 (Ref 2).

1.2.4 The Exempt Overhead Line Works constitute permitted development under Part 15 Class B of the Town and Country Planning (General Permitted Development) (England) Order 2015 and The Overhead Lines (Exemption) (England and Wales) Regulations 2009 (Ref 4).

1.2.5 The Scheme in its totality is a standalone development to enable connection of the Outer Dowsing Offshore Wind Farm to the national electricity transmission system. Each component stated in **Table 1.1** above is required for the Scheme to fully function as part of the National Electricity Transmission System (NETS).

1.3 Purpose of this Report

1.3.1 This report has been prepared in support of the Pplanning Aapplication for the Substation Works under the TCPA (Planning Application) and has been informed by engagement between National Grid and pre-application consultation with SHDC. It is therefore specifically focussed on the Substation Works component.

1.3.2 The Substation Works Site Boundary is illustrated on **Figure 1**, which consists of the land required to construct and operate the Substation Works component of the Scheme.

1.3.3 This report forms part of a suite of consent applications required to deliver the Scheme in its entirety. The mandatory Biodiversity Net Gain (BNG) requirement under Schedule 7A of the Town and Country Planning Act 1990 (as inserted by the Environment Act 2021) applies only to the TCPA consenting regime, as such, this report and the accompanying Statutory Biodiversity Metric address the substation elements of the Scheme only (i.e. the Substation Works). **Table 1.1** sets out the full range of consent applications and their associated Scheme components, providing context for the wider consenting route of the Scheme.

1.3.4 The purpose of this report is to complement and explain the finalised BNG calculation undertaken for the Substation Works. The report should be read in conjunction with the accompanying Statutory Biodiversity Metric (Ref 6), both of which form part of the Planning Application. The scope of this design stage report is to:

1) Summarise the biodiversity baseline which has been used to inform the BNG calculations;
2) Detail the methodology and assumptions used to undertake the BNG calculations;
3) Detail the anticipated loss of habitat as a result of the Substation Works;
4) Detail the post-construction habitat creation and enhancement measures proposed within the BNG calculation, in line with the **Indicative Landscape and Ecological Mitigation Proposals**; and
5) Define a draft schedule for management and monitoring to be undertaken to ensure post-construction BNG requirements are achieved.

1.3.5 This report has been prepared with reference to current guidelines for Natural England's Statutory Biodiversity Metric. The structure follows the guidance provided within the Chartered Institute of Ecology and Environmental Management (CIEEM) Biodiversity Net Gain Report & Audit Template (Ref 7).

1.4 Structure

1.4.1 The report is structured as follows:

1) Legislative and Policy Framework – This section provides an overview of the legislation and national, regional and local policy of relevance to this report;
2) Methodology – This section details the data collection that has informed the report, the approach to BNG and any assumptions and limitations;
3) Baseline Ecological Conditions – This section details the on-site habitat baseline as informed by the desk study and field surveys conducted in support of the Planning Application;
4) Proposed Design – This section summarises the key habitat losses and gains that will occur as a result of the construction of the Substation Works;
5) BNG Requirements and Principles – This section sets out the post-intervention biodiversity units, the proposed approach to achieving 10% BNG and the requirements and principles that have informed this approach;
6) Draft Habitat Management and Monitoring Plan – This section outlines the draft long-term management measures and monitoring requirements for the proposed habitat creation and enhancement measures that contribute to BNG; and
7) Conclusion and Next Steps – This section provides a summary of the outcomes of the report and next steps.

2. Legislative and Policy Framework

2.1.0 Legislation and national and local planning policy relevant to the Scheme is described in the **Planning, Design and Access Statement**. Key legislation and policy specifically relevant to BNG is summarised in the following sections.

2.1 Legislation

2.1.1 The following section describes BNG legislation and policy in England. The delivery of 10% BNG does not negate the requirement to ensure compliance with other relevant ecological legislation and policy (as described within the **Ecological Impact Assessment (EcIA) Report** for the Scheme).

2.1.2 In 2018, the Government published 'A Green Future: Our 25 Year Plan to Improve the Environment' (Ref 8). This policy document set out the Government's goals for improving the environment within the United Kingdom (UK). The measures include embedding an 'environmental net gain' principle within development proposals, including specific reference to strengthening the planning system such that BNG is more than an aspirational target.

2.1.3 The Environment Act 2021 (Ref 9) is a key mechanism for delivering on these goals. The Environment Act includes the mandatory requirement for new developments to provide BNG. This requires planning applicants to demonstrate that proposals will achieve at least a 10% increase in biodiversity (as measured by biodiversity units) after the development, when compared to the level of biodiversity pre-development. This mandate came into effect in England on 12 February 2024 through an amendment to the TCPA 1990 by inclusion of Schedule 7A. Delivery of 10% BNG is therefore now mandatory for developments requiring planning permission (unless exempt).

2.1.4 The Environment Act includes provision to exempt irreplaceable habitats from the mandatory BNG requirement. The Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024 (Ref 10) provides a list and clear definitions of what constitutes an irreplaceable habitat, which includes: blanket bog, lowland fens, limestone pavements, coastal sand dunes, ancient woodland, ancient and veteran trees, Spartina saltmarsh swards and Mediterranean saltmarsh scrub.

2.1.5 Guidance is also provided to explain that irreplaceable habitats require separate consideration which must comply with relevant policy and legislation, including compensation requirements (Ref 11). Mandatory BNG does not change the existing protections and compensation requirements for these habitats in planning policy. The Environment Act therefore makes provision for 'modifying or excluding' the application of the biodiversity gain condition in relation to development where the on-site habitat includes irreplaceable habitats.

2.2 Policy

2.2.1 The revised National Planning Policy Framework (NPPF) (Ref 12) was published in December 2024 and further amended in February 2025. It is a material consideration for planning decisions. The Framework establishes a presumption in favour of sustainable development (paragraph 11) as its central principle and requires the planning system to pursue three mutually supportive overarching objectives (economic, social and environmental objectives (paragraph 10).

2.2.2 NPPF Paragraph 187 (d) refers to 'minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures which support priority or threatened species such as swifts, bats and hedgehogs'.

2.2.3 In order to deliver 10% BNG, there is a legal obligation to monitor, manage and maintain any created and/or enhanced habitats for at least 30 years to achieve the target condition (Ref 13). In England, on-site BNG measures would be secured through planning condition, conservation covenant or S106 agreement, and preparation of a Habitat Management and Monitoring Plan (HMMP) that would set out how the habitat will be maintained, who is responsible for creating or enhancing the habitats and who is responsible for maintenance, management and monitoring for the 30 year period. The 10% BNG requirement can also be achieved through habitat creation or enhancement measures on land 'offsite', i.e. purchase of off-site biodiversity units from third-parties. As a last resort statutory biodiversity credits can be purchased from the government to meet a project's 10% BNG target.

2.2.4 South East Lincolnshire Plan 2011-2036 (Ref 14) Policy 28 sets out requirements for consideration of the natural environment when preparing development proposals. This includes a requirement for all development proposals to provide an overall net gain in biodiversity, by:

1) Protecting the biodiversity value of land, buildings and trees (including veteran trees) minimising the fragmentation of habitats;
2) Maximising the opportunities for restoration, enhancement and connection of natural habitats and species of principal importance;
3) Incorporating beneficial biodiversity conservation features on buildings, where appropriate; and maximising opportunities to enhance green infrastructure and ecological corridors, including water space; and
4) Conserving or enhancing biodiversity or geodiversity conservation features that will provide new habitat and help wildlife to adapt to climate change, and if the development is within a Nature Improvement Area (NIA), contributing to the aims and objectives of the NIA.

3. Methodology

3.1 Baseline ecological data

3.1.1 Baseline ecological information for the Scheme is presented within the **EcIA Report**, comprising relevant desk study and field survey methods and results relating to the wider Scheme Site Boundary. The methodologies relevant to the collection of data that is used within the BNG assessment for the Substation Works are summarised below. As described further in **Paragraph 3.2.5**, the BNG calculation is based solely on the Substation Works Site Boundary.

Desk Study

3.1.2 Information regarding statutory designated sites of international importance, including Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites, were obtained from the government's Multi-Agency Geographic Information for the Countryside (MAGIC) website (Ref 15) for an area within 20 km of the Substation Works Site Boundary.

3.1.3 Information regarding statutory sites of national importance e.g. Sites of Special Scientific Interest (SSSIs), within 5 km of the Substation Works Site Boundary was obtained from MAGIC (Ref 15). For SSSIs designated for their bird interest the search area was extended to 20 km. MAGIC was also used to identify areas of Priority Habitat and ancient woodland within and adjacent to the Substation Works Site Boundary. All information obtained from MAGIC was accessed in February 2026.

3.1.4 Information regarding relevant protected and/or notable species and non-statutory designated sites was obtained from the Greater Lincolnshire Nature Partnership (GLNP) who were contacted in February 2026 to obtain desk study data within 2 km of the Substation Works Site Boundary. The ancient and veteran tree inventory (Ref 16) was used to obtain data regarding ancient and veteran trees relevant to the Substation Works Site Boundary.

3.1.5 Aerial photographs (Ref 17) were also reviewed to provide an indication of the habitat types likely to occur on adjacent land and the ecological connectivity of the Substation Works Site Boundary to areas of semi-natural habitats. Historic aerial imagery (Ref 18) was reviewed to assess recent land use change and potential degradation of the habitat baseline prior to field surveys, within the context of the BNG assessment.

Field Surveys

3.1.6 Field surveys were conducted across various dates from May 2024 to September 2025, with the vast majority of survey effort falling within the optimal period for botanical identification. Please see the **Habitat Classification Survey Report** for details.

3.1.7 Each survey was completed by survey teams consisting of two ecologists, with lead ecologists all experienced with botanical species identification required for habitat

classification. Handheld electronic devices were utilised to capture geospatial data for individual habitat parcels accurately from the field.

3.1.8 Habitats were mapped using UK Habitats (UKHab) classification for use with the Statutory Biodiversity Metric, where UKHab classifications do not directly align with habitat types in the Statutory Biodiversity Metric, habitat categorisation was converted accordingly using professional judgement. UKHab is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas of land based on the vegetation communities present and context of the feature. All accessible areas of the site were walked, and the relevant habitat types classified. UKHab secondary codes were added to record supplementary information for specific habitat parcels, where relevant. Classified habitats were mapped digitally using Arc Geographic Information System (GIS) Pro FieldMaps to calculate the area or length of each feature.

3.1.9 The area of any individual trees was calculated using the 'tree helper' tool on the main menu tab of the Statutory Biodiversity Metric, whereby the number of each size tree (small, medium, large and very large) input generates a total area. Individual trees are considered to overlap any habitat parcel beneath them. As such, the area generated for trees is added to the area of other habitat parcels within the Statutory Biodiversity Metric, and the total habitat area of the site, as defined by the Statutory Biodiversity Metric, will be greater than the land area of the two-dimensional planning boundary.

3.1.10 Any evidence of invasive non-native plant species (INNPS) listed on Schedule 9 of the Wildlife and Countryside Act (WCA) 198 (Ref 19) and The Invasive Alien Species (Enforcement and Permitting) Order 2019 (Ref 20) and subject to strict legal control, such as Japanese knotweed *Reynoutria japonica*, Himalayan balsam *Impatiens glandulifera* and giant hogweed *Heracleum mantegazzianum* was also recorded.

3.1.11 Condition assessments were also conducted for all watercourses where the watercourse itself or the riparian zone (10 m buffer from the bank top[1] for rivers/streams/canals and 5 m buffer for ditches) fell within the Substation Works Site Boundary, following MoRPh survey methodology (Ref 21) where necessary (described further in **Appendix A**). Condition assessments for all non-watercourse habitats followed methodology provided in the Statutory Biodiversity Metric Condition Assessments spreadsheet (Ref 22).

Baseline Biodiversity Units

3.1.12 The baseline of the Substation Works was established on the date of the field surveys (various dates between May 2024 – September 2025). A review of historic aerial imagery on Google Earth Pro, indicates that no significant changes to habitat types or site usage have occurred on-site in the past five years. The field surveys dates are therefore considered to be suitable for the baseline assessment.

[1] The linear boundary where there is a break in slope between the river channel and surrounding landscape.

3.2 Approach to BNG

Design

3.2.1 The approach to consideration and incorporation of BNG into the design at each stage of the Scheme aligns with the BNG Good Practice Principles for Development (Ref 23), produced by Construction Industry Research and Information Association (CIRIA), CIEEM and the Institute of Environmental Management and Assessment (IEMA)[2]. This includes application of the mitigation hierarchy to avoid and minimise the loss of habitats wherever possible, particularly where these habitats are of higher ecological value or may be difficult to reinstate.

3.2.2 Full details of how the design and construction of the Substation Works has aligned with the BNG Good Practice Principles are provided throughout **Section 6.4**.

Mapping

3.2.3 All baseline habitats were mapped using ESRI ArcMap Geographic Information System (GIS) to calculate the area/length of each habitat. A minimum mappable unit of three decimal places was used for mapping (0.001 ha, 10 m^2), deemed appropriate given the scale of the Substation Works. Any habitats present under this threshold would be subsumed into the appropriate adjacent habitat. For example, a patch of scrub of 5 m^2 within grassland would not be mapped and would be considered part of the grassland, but this scrub would be considered for the habitat condition assessment of the grassland.

3.2.4 These mapped habitats, along with on-site condition assessments, were used in the Statutory Biodiversity Metric to establish the baseline biodiversity units for area based and linear habitats. A series of data cleaning and quality assurance checks were undertaken to ensure the GIS polygons did not overlap and that there were no significant gaps within the data.

Calculation

3.2.5 For the purposes of the BNG calculation, the Substation Works Site Boundary has been utilised for the baseline area, herein referred to as ‘on-site’. This boundary has been developed in consultation with the Substation Works designers, client and contractors in order to encompass all areas to be impacted by construction. There are no areas classified as ‘off-site’, at this stage of the BNG calculations.

3.2.6 The Statutory Biodiversity Metric guidance (Ref 30) states that where a Local Nature Recovery Strategy (LNRS) (Ref 24) for an area has been published, the baseline strategic significance values for habitat parcels in that area should always be scored as low. The public consultation on the Greater Lincolnshire Local Nature Recovery Strategy (LNRS) ended in March 2026 and is due to be adopted in June 2026. In lieu of the finalised LNRS, strategic significance of baseline and post-intervention habitats within the Statutory Biodiversity Metric has been determined through alignment with the draft LNRS (Ref 24) and areas identified by the Greater Lincolnshire Nature

[2] The Institute of Environmental Management and Assessment (IEMA) has recently become the Institute of Sustainability and Environmental Professionals (ISEP).

Partnership as of particular importance for biodiversity: such habitats are classified as 'within local plans'.

3.2.7 All habitat areas or lengths entered into the Statutory Biodiversity Metric have been rounded to two decimal places.

Implementation

3.2.8 Target habitat type and condition for post-construction habitats are provided as a realistic estimate of what is considered achievable. Justification for the target habitat condition is provided in **Section 6**. The management and monitoring of these habitats is expected to be conditioned as part of the Planning Application. This will be detailed within a HMMP.

Evidence of technical competence

3.2.9 Steven Mills is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). He holds an MSc in Wildlife Conservation and Management from the University of Newcastle (2008) and has 13 years of professional ecological consultancy experience working across various sectors. Steven attended several training courses, and webinars run by Natural England and CIEEM on the implementation of Defra Biodiversity Metrics. Steven has led the terrestrial habitat data collection for this Scheme which has informed the BNG calculation.

3.2.10 Mike Ashford is a Chartered Ecologist (CEcol) and a full member of the of the Chartered Institute of Ecology and Environmental Management (MCIEEM). He holds an MSc in Ecology and Management of the Natural Environment from the University of Bristol and has 14 years of professional ecological consultancy experience working across various sectors. Mike has attended several training courses on the implementation of Defra Biodiversity Metrics and has experience implementing BNG in various worked project scenarios. Mike has led on BNG strategy and delivery on the Substation Works, coordinating BNG calculation and preparation of this report.

3.2.11 Holly Potter holds an MSc in Biodiversity and Conservation from the University of Leeds and has 4 years of professional ecological consultancy experience working across various sectors. Holly has completed the River Condition Assessment training with Cartographer and has supported BNG surveys and metric assessments for various projects. Holly has led on Aquatic BNG data collection and watercourse BNG calculation for the Substation Works.

3.2.12 Bridey Callingham is a qualifying member of the Chartered Institute of Ecology and Environmental Management (Qualifying CIEEM). She holds an MSc in Conservation and Ecosystem Management from the University of Newcastle (2022) and has 3 years of professional ecological consultancy experience working across ecology and Biodiversity Net Gain. Bridey has coordinated between the ecology and Geographic Information Systems (GIS) technical teams in delivery of the BNG calculation for the Substation Works.

3.3 Assumptions and Limitations (Baseline)

3.3.1 The baseline findings presented in this report represent those at the time of survey and reporting, and data collected from available sources. Ecological surveys can be limited by factors affecting the presence of plants and animals, such as the time of

year, migration patterns and behaviour. The absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

3.3.2 The majority of the Substation Works Site Boundary has been surveyed with the exception of an area to the east of Marsh road and south of Lord's Drain, and an area along Stone Gate to north of Weston, where access was not available. In these instances the habitats were mapped using aerial imagery and opensource habitat data for input into the BNG baseline calculation.

3.3.3 Individual hedgerow trees have not been mapped as part of the hedgerow survey. These have been mapped for the purposes of the BNG calculation using the Bluesky National Tree Map (Ref 25) data, which is based on high resolution national aerial photography, terrain and surface data, and colour infrared imagery.

4. Baseline ecological conditions

4.1 Desk study

4.1.1 Three internationally important designated sites fall within the Study Area and are located approximately 5.6 km north east of the Substation Works Site Boundary: The Wash Special Protection Area (SPA), The Wash Ramsar site and The Wash and North Norfolk Coast Special Area of Conservation (SAC). The Wash SPA and Ramsar site is designated for its saltmarsh, intertidal sand and mud flat and estuarine habitats and bird assemblage including those with large foraging ranges. The Wash and North Norfolk Coast SAC is designated for a range of habitats including mudflats, sandbanks, coastal lagoons and reefs and populations of otter *Lutra lutra* and grey seal *Halichoerus grypus*. The Wash is also designated as a SSSI for its bird assemblage.

4.1.2 Surfleet Lows SSSI is located 3.1 km to the west of the Substation Works Site Boundary. The SSSI represents one of the few remaining wet alluvial meadows in Lincolnshire that has not been subject to agricultural improvement.

4.1.3 Vernatts Local Nature Reserve (LNR) is located 4.3 km to the south west of the Substation Works Site Boundary. The LNR is a council and volunteer run nature reserve comprising woodland on former brownfield land.

4.1.4 There are 12 sites that are non-statutorily designated for their biodiversity value as Local Wildlife Sites (LWSs) within 2 km of the Substation Works Site Boundary. The closest of which are Surfleet Seas End Saltmarsh LWS, Vernatt's Drain LWS and Surfleet Bank LWS, each located within 0.2 km of the Substation Works.

4.1.5 Habitats of Principal Importance including coastal saltmarsh, mudflats, coastal and floodplain grazing marsh (CFGM) and rivers are present within the Scheme Site Boundary along the River Welland. These habitats are located outside of the Substation Works Site Boundary.

4.1.6 No ancient, veteran, notable trees, or notable plants, or invasive non-native plant species were identified from the desk study within the Substation Works Site Boundary.

4.1.7 Full details of the desk study results for all designated sites, species and habitats within the Study Area are provided in the **Ecological Impact Assessment Report**.

4.2 Field survey

4.2.1 The baseline habitats on-site are summarised in **Table 4.1**, **Table 4.2**, **Table 4.3** and shown within **Figure 2.1** and **2.2**. Please note the figures reported in **Tables 4.1** – **4.3** are taken from the Statutory Biodiversity Metric but rounded to 2 decimal points, the totals reported in the paragraphs after each table reflect the unrounded results directly from the Statutory Biodiversity Metric. Full descriptions of the habitat types and individual condition scoring criteria of these habitats are provided in the **Appendix B** for terrestrial habitats, and **Appendix A** for watercourses.

Table 4.1 Summary of the habitat baseline

Baseline habitat type	Distinctiveness	Baseline area (ha)	Baseline habitat units
Cropland - Cereal crops	2	73.44	146.89
Cropland – Non-cereal crops	2	14.76	29.53
Grassland - Other neutral grassland	4	0.06	0.24
Urban - Developed land; sealed surface	0	1.12	0
Urban – Bare ground	2	0.003	0.01
Urban – Built linear features	0	0.003	0
Individual trees – Rural tree	4	0.51	4.10

4.2.2 This provides a total of 180.76 habitat units as the baseline, across an area of 89.91 ha.

Table 4.2 Summary of the hedgerow baseline

Baseline habitat type	Distinctiveness	Baseline length (km)	Baseline hedgerow units
Line of trees	2	0.006	0.01
Ecologically valuable line of trees	4	0.355	1.59
Native hedgerow	2	0.59	2.63
Native hedgerow with trees – associated with bank or ditch	6	0.002	0.02

4.2.3 This provides a total of 4.26 hedgerow units as the baseline, across a length of 0.95 km.

Table 4.3 Summary of the watercourse baseline.

Baseline habitat type	Distinctiveness	Baseline length / km	Baseline watercourse units
Other rivers and streams	6	2.33	10.49
Ditches	4	2.00	10.80
Culvert	2	0.02	0.03

4.2.4 This provides a total of 21.32 watercourse units as the baseline, across a length of 4.35 km.

5. Proposed Design

5.1.0 This section summarises the key habitat losses and gains that will occur because of the construction of the Substation Works. The design of the Substation Works has focused on minimising impacts to key habitats (Medium distinctiveness or above) through option identification, appraisal, selection and refinement. In summary, predominantly arable farmland, with small areas of other neutral and modified grassland, boundary ditches and hedgerow, and broadleaved woodland, will be converted into buildings and hard standing, other broadleaved woodland, scrub and other neutral grassland.

5.1 Assumptions and Limitations (Associated with Post-Intervention Assessment)

5.1.1 It is important to note the assumptions applied in the post-intervention BNG calculations, as follows:

1) Target conditions for post-intervention habitats were determined based on what would be feasibly achievable and practical based on management techniques as defined within the Draft HMMP (**Section 7**), then comparing against the relevant condition criteria for the selected habitat type. Assumptions were made using professional judgement regarding the achievable condition of habitats (detailed in **Appendix D**);

2) Construction is anticipated to occur between Quarter 1 2028 and Quarter 3 2031. As a reasonable worst-case scenario, it is assumed that all habitat creation would occur at the end of construction. The temporal multiplier for delay in habitat creation has therefore been set to four years within the Statutory Biodiversity Metric, noting the metric requires rounding to the nearest whole number. This may require adjustment at later stages of the Scheme when the construction programme is defined. Options could be explored to front-load some habitat creation, in order to increase the number of units delivered by the Substation Works;

3) There may be a marginal difference in the habitat areas/lengths reported in the proposed planting specification versus the habitat areas established within ArcGIS Pro, due to how the proposed planting specification habitat types align with and were converted into UKHab classifications; and

4) Maintenance and management prescriptions for each on-site habitat type are defined within the Draft HMMP for the Substation Works Pplanning Aapplication, which may be subject to minor changes at later stages of the Scheme (e.g., upon purchase of off-site units, design refinements). It has been assumed that any required changes would still ensure that the relevant habitat type definition and relevant habitat condition criteria will be met as needed (further details provided in **Section 7** and **Appendix D**), as informed by the Scheme's ecologist at the time. Tailored management and monitoring of on-site habitats would be the responsibility of National Grid or appointed contractors. The management and monitoring of off-site units purchased from third party providers would be the responsibility of those providers.

5.2 Habitat Losses and Retention

5.2.1 The majority of existing on-site habitats will be considered lost either to permanent structures associated with the new Weston Marsh Substation A, or considered temporarily lost and reinstated due to the duration of construction (c.3.5 years). **Figure 3.1** and **Figure 3.2** display lost and retained habitats. Habitats including cropland, ditches, other neutral grassland, native hedgerows and lines of trees will be lost to facilitate the creation of the buildings and associated infrastructure such as haul road and permanent access, road widening and watercourse diversions, for the Substation Works. Habitat losses, including reasons, are summarised in **Table 5.1**. Please note the figures have been taken from the Statutory Biodiversity Metric, amalgamated and rounded to 2 decimal places, the totals have been taken from the Statutory Biodiversity Metric directly so there may be some slight discrepancy.

Table 5.1 Summary of lost and retained habitats, hedgerows and watercourses

Metric Habitat Type	Baseline area / units	Lost area / units	Retained area / units	Reason for Loss / Retention
Cropland - Cereal crops	73.44 ha / 146.89	41.97 ha / 83.94	31.47 ha / 62.95	Lost to construction of the substation. This includes permanent loss to the substation and temporary loss to facilitate construction activities and subsequent reinstatement to cropland but after 2 years therefore considered lost within the metric. Retained areas are those included within the Substation Works Site Boundary for the purposes of farmland bird mitigation, and areas temporarily impacted by construction but able to be reinstated within 2 years therefore considered retained within the metric.
Cropland – Non-cereal crops	14.76 ha / 29.53	6.26 ha / 12.52	8.5 ha / 17.01	Lost temporarily during construction for construction of satellite compound and haul road. Temporary loss also associated with works to third party services. Reinstatement to cropland post construction however this will be after 2 years

Metric Habitat Type	Baseline area / units	Lost area / units	Retained area / units	Reason for Loss / Retention
				therefore considered lost within the metric. Retained areas are those included within the Substation Works Site Boundary for the purposes of farmland bird mitigation.
Grassland - Other neutral grassland	0.06 ha / 0.24	0.06 ha / 0.24	0 ha / 0	Temporary loss associated with works to third party services. Habitat to be reinstated on completion of works however assumed would be greater than 2 years until reinstatement, therefore considered lost within the metric.
Urban - Developed land; sealed surface	1.12 ha / 0	0 ha / 0	1.12 ha / 0	Retained and incorporated into wider area of developed land; sealed surface.
Urban – Bare ground	0.003 ha / 0.01	0 ha / 0	0.003 ha / 0.01	Retained alongside Marsh Road.
Individual trees – Rural trees	0.513 ha / 4.10	0 ha / 0	0.513 ha / 4.10	14 x rural trees retained within areas of farmland bird mitigation and landscape screening, and alongside Marsh Road.
Total for habitats	**89.91 ha / 180.76**	**48.29 ha / 96.70**	**41.62 ha / 84.06**	
Native hedgerow	0.59 km / 2.63	0.18 km / 1.01	0.41 km / 1.62	Permanent loss of 180 m of hedgerow to construction of the drainage channel diversion. Remainder retained and to be bolstered as part of landscape screening.
Native hedgerow with trees – with bank or ditch	0.002 km / 0.02	0.002 km / 0.02	0 km / 0	Entire length retained within area identified for farmland bird mitigation.

Metric Habitat Type	Baseline area / units	Lost area / units	Retained area / units	Reason for Loss / Retention
Ecologically valuable line of trees	0.36 km / 1.59	0.04 km / 0.34	0.31 km / 1.25	Permanent loss of 40 m line of trees to facilitate visibility splays for haul road junction with Stone Gate. Remainder of this linear habitat retained within an area of proposed woodland planting for landscape screening.
Line of trees	0.01 km / 0.01	0.01 km / 0.03	0 km / 0	Permanent loss of 10 m of tree line to third party overhead line works.
Total for hedgerows	**0.96 km / 4.26**	**0.23 km / 1.36**	**0.72 km / 2.90**	
Other rivers and streams	2.33 km / 10.49	0.74 km / 3.35	1.14 km / 5.14	Permanent loss to construction of the substation, watercourse to be realigned to the east of the substation.
Ditches	2.00 km / 10.80	0.44 km / 1.42	1.56 km / 9.38	Road widening on Stone Gate will result in the direct loss of sections of ditches, and major encroachment into the riparian zone of retained ditches.
Culvert	0.02 km / 0.03	0.01 km / 0.01	0.02 km / 0.03	Culvert to be lost on the existing watercourse that will be diverted to facilitate construction of the substation. All other existing culverts retained.
Total for watercourses	**4.35 km / 21.32**	**1.19 km / 4.78**	**2.72 km / 14.54**	

5.3 Habitat Creation and Enhancement

5.3.1 Following construction, the majority of the post-intervention habitats within the Substation Works Site Boundary will comprise ‘developed land; sealed surface’ associated with the new Weston Marsh Substation A, or reinstated cropland that will only temporarily be taken to facilitate construction. Smaller areas of other broadleaved woodland, native species-rich hedgerows and modified grassland will be created, primarily as part of the landscape screening and landscape integration for the new Weston Marsh Substation A.

5.3.2 As part of the drainage strategy for the new Weston Marsh Substation A, two permanent Sustainable Urban Drainage (SUDs) basins will be created, as well as swales either side of the new Weston Marsh Substation A access road; all within the Substation Works Site Boundary. While not designed to permanently hold water, these features will be periodically inundated and will be seeded with a water tolerant wildflower grassland mix.

5.3.3 The Substation Works will require a drainage ditch diversion. The new ditch will primarily function for land drainage purposes and as such, has specific profile structure requirements and would be subject to regular dredging and other management practices which limit the opportunities for further enhancements and contributions to BNG. The banks of the ditch would be seeded with an amenity grassland mix.

5.3.4 It is not the intention for National Grid to permanently acquire the extent of land required for temporary works to facilitate construction of the new Weston Marsh Substation A, noting the majority of this land is Grade 1 agricultural land. Areas within the Substation Works Site Boundary temporarily required for construction of the new Weston Marsh Substation A would largely be reinstated post-construction and returned to their baseline habitat type, predominantly cropland habitats. However, due to customer connection requirements to the substation it is likely that the reinstated cropland habitats immediately around the substation would be disturbed again. These cropland habitats have therefore been scored as ‘Developed land; sealed surface’ habitat within the Statutory Biodiversity Metric so it acquires zero units within the post intervention calculation recognising the low certainty of the habitat being reestablished for the long term.

5.3.5 An additional area of cropland habitat to the west of the new Weston Marsh Substation A (i.e. beyond the temporary construction area) has been incorporated into the Substation Works Site Boundary to provide the Scheme’s environmental mitigation for the purposes of compensating for the loss of habitat for farmland birds. Enhancements for farmland birds in this instance would be achieved through more sensitive cropping regimes rather than changes in habitats type. It is therefore assumed for the purposes of the BNG calculation that this habitat would be retained as cropland habitat. There may be opportunities through further engagement post-consent with landowners to incorporate more substantial habitat change, i.e. through provision of set aside areas, which would likely represent a habitat change within the context of the BNG calculation, however this would primarily be driven by requirements for farmland birds and would therefore contribute up to no net loss only.

5.3.6 An area of modified grassland is proposed along Marsh Road adjacent to the proposed hedgerow planting forming part of the landscape integration of the substation and access road. This stretch will be seeded with an amenity grassland mix, as this area will be managed and retained alongside the hedgerow planting it has been included within the BNG calculation for the Substation Works. Additional

areas of modified grassland are proposed immediately around the substation as part of its aesthetic and landscape integration. As with the areas of cropland around the substation, it is unlikely these modified grasslands would be able to be established undisturbed for the long term due to the future electricity infrastructure and customer connection requirements to the substation. These modified grassland habitats have therefore also been scored as 'Developed land; sealed surface' habitat within the metric so it acquires zero units within the post intervention calculation recognising the low certainty of the habitat being reestablished for the long term.

5.3.7 **Table 6.1** in **Section 6** provides a list of the habitat types within the proposed planting specification, alongside the corresponding Statutory Biodiversity Metric habitat type, following a review of UKHab definitions and what is considered feasible to achieve. Also included are details of the post-intervention target condition and strategic significance of each habitat type. The Draft HMMP within **Section 7** includes outline habitat creation and management measures, along with monitoring and remedial actions to ensure target habitat types and conditions are achieved. The **Indicative Landscape and Ecological Mitigation Proposals** displays the proposed habitat creation within the Substation Works Site Boundary.

5.3.8 ~~Most of the~~The created habitats are not considered to be strategically significant for the area~~, with the exception of the other broadleaved woodland. Planting of woodland is identified as a priority measure~~ within the draft Greater Lincolnshire LNRS (Ref 24), and have all therefore been listed as of low strategic significance within the Statutory Biodiversity Metric.

5.3.9 For all habitats created, a targeted habitat condition must be selected based upon the guidance for condition scoring detailed within Statutory Biodiversity Metric. This condition is based on the habitat reaching maturity, not the initial condition at time of planting. The Statutory Biodiversity Metric uses pre-selected multipliers for the standard time to target condition, and this often increases as better condition is selected.

5.3.10 Where there is uncertainty, a precautionary approach has been taken, often resulting in a moderate condition. Full details of the assumptions made for each criterion in the condition scoring for each of the habitats listed in **Table 6.1** is provided in **Appendix E**.

5.4 Impacts to Irreplaceable Habitats and Other Important Ecological Features

5.4.1 No irreplaceable habitats were identified on-site, and no further consideration of irreplaceable habitats is therefore required.

5.4.2 The **EcIA Report** for the Scheme identified several important ecological features, including The Wash SPA, Ramsar and SSSI (approximately 5.6 km north east), and The Wash and North Norfolk Coast SAC (approximately 5.6 km east), the Surfleet Lows SSSI (approximately 3.1 km west) and Vernatts LNR (4.3 km south west) and various Habitats of Principal Importance. Habitats on-site were confirmed to support, or have the potential to support, a range of protected and notable species including farmland birds, marsh harrier, peregrine falcon, quail, bats, otter and water vole.

5.4.3 Specific impacts to designated sites, habitats of principal importance and protected / notable species are assessed separately within the **EcIA Report** and **Habitats Regulations Assessment Stage 1 Screening Report** for the Scheme.

6. BNG Requirements and Principles

6.1 Biodiversity Gain Hierarchy

6.1.1 The Biodiversity Gain (Town and Country Planning) (Modifications and Amendments) (England) Regulations 2024 (Ref 25), introduced the concept of the biodiversity gain hierarchy which must be considered by a local planning authority when assessing a planning application under TCPA. The Biodiversity Gain Hierarchy sets out the priority order for developers to apply for achieving BNG:

1) Avoid impacts;
2) Minimise impacts;
3) Enhance and create habitat on-site;
4) Use registered off-site units; and
5) As a last resort purchase statutory credits.

6.1.2 The biodiversity gain hierarchy has been applied throughout the design process for the Substation Works:

1) **Avoidance:** Impacts on existing habitats have been minimised through siting of infrastructure within areas of lowest baseline biodiversity value and through retention of site boundaries where practicable;
2) **Minimisation**: Habitat loss has been reduced through compact infrastructure layout and limitation of development footprints to the minimum required for safe operation of the substation;
3) **Onsite enhancement and creation**: On-site biodiversity enhancements have been incorporated where compatible with operational requirements, including broadleaved woodland, other neutral grassland, species-rich hedgerows and tree planting which have been incorporated as part of the long term landscape screening and integration for the substation, as described in **Section 5.3**, and these contribute to the biodiversity gain objective;
4) **Offsite creation**: Registered off-site units will be procured to address the shortfall in biodiversity units required to achieve 10% gain as detailed within **Section 6.2**; and
5) **Statutory credits**: It is not the intention to utilise the 'last resort' option of statutory credits to achieve 10% gain.

6.1.3 On-site biodiversity net gain is proposed in locations which can be managed and maintained for at least 30 years and which will be undisturbed by future development, because:

1) continuity of habitat delivers better outcomes for nature; and
2) ensures better value for money for consumers by avoiding having to replace BNG habitat to accommodate future development.

6.1.4 Notwithstanding these measures, the scope for further permanent on-site habitat creation is constrained by current and future operational requirements of the site over the 30-year BNG management period.

6.1.5 While the development delivers biodiversity enhancements onsite, it is not possible to secure the entirety of the biodiversity net gain on-site. There are known future connections planned into the new Weston Marsh Substation A including Outer Dowsing Offshore Wind Farm project as well as other local renewable energy projects. Each of these projects is at different stages of design development therefore there is uncertainty around the potential land requirements and impacts around the immediate vicinity of the new Weston Marsh Substation A, which must retain flexibility for future electricity infrastructure and customer connection works. Creating additional on-site land for biodiversity habitats would risk future loss or degradation of BNG habitat by these works, conflicting with the requirement to secure biodiversity gains for a minimum of 30 years.

6.1.6 It is also recognised that given the intensively managed agricultural landscape around the new Weston Marsh Substation A it is not the best location for on-site BNG habitat creation from a wider biodiversity outcomes perspective. Rather, contributing to larger strategic off-site BNG projects with trusted third-party unit providers is likely to result in better outcomes for biodiversity, as well as wider environmental benefits. Delivering the residual BNG requirement through registered off-site biodiversity units ensures that gains are secure, deliverable and legally enforceable for the full management period, without creating future conflict between biodiversity commitments and essential infrastructure provision.

6.2 Post-Intervention Biodiversity Unit Value

On-Site Biodiversity Unit Value

6.2.1 The post-intervention calculation established that implementation of the Substation Works and proposed planting specification (including retained habitats) would result in a total of 14~~36~~.18~~42~~ habitat units, 8.43 hedgerow units and 18.92 watercourse units. Overall, this represents a net change of -3~~74~~.58~~34~~ habitat units (-20.79~~19~~% net change), 4.18 hedgerow units (+98.08% net change), and -2.40 watercourse units (-11.27% net change).

6.2.2 The legally required 10% BNG would therefore not be met on-site for habitat units or watercourse units. Off-site proposals are therefore discussed further below.

6.2.3 A summary of post-intervention created habitats, and the associated calculation is provided, in **Table 6.1** please note these do not include retained habitats and therefore do not represent the total on-site post-intervention units (this is summarised in **Table 6.4**, **Table 6.5** and **Table 6.6).** For further details of the Substation Works proposed planting specification, target habitat type, and habitat condition, please refer to the **Indicative Landscape and Ecological Mitigation Proposals**, the completed Statutory Biodiversity Metric spreadsheet within **Appendix C** and draft outline habitat monitoring criteria tables within **Appendix D**.

Table 6.1 Summary of habitats created

Habitat type on landscape plan	Metric Habitat Type	Distinctiveness	Condition	Strategic Significance	Delay in Creation	Area	Units Delivered
Proposed woodland mix / woodland edge scrub mix	Other woodland; broadleaved	Medium	Moderate	High	4 years	5.31	214.5882
Proposed wet meadow mix	Grassland – other neutral	Medium	Moderate	Low	4 years	0.06	0.35
Proposed species rich grassland	Grassland – other neutral	Medium	Moderate	Low	4 years	2.51	14.54
Amenity planting mix	Grassland – modified grassland	Low	Moderate	Low	4 years	0.38	1.13
Proposed heavy standard tree	Individual trees – rural tree	Medium	Moderate	Low	4 years	0.07	0.17
Substation infrastructure and immediately surrounding amenity grassland and cropland	Developed land; sealed surface	V.low	N/A	N/A	4 years	28.02	0
Reinstated arable and skylark mitigation	Cereal crops	V.low	N/A	N/A	4 years	6.50	10.87
Reinstated arable and skylark mitigation	Non – cereal crops	V.low	N/A	N/A	4 years	6.26	10.48
	Total					**49.10**	**62.36**

Table 6.2 Summary of hedgerows created

Habitat type on landscape plan	Metric Habitat Type	Distinctiveness	Condition	Strategic Significance	Delay in Creation	Length	Units Delivered
Proposed hedgerow	Species-rich native hedgerow	Medium	Moderate	Low	4 years	0.95	5.54
	Total					**0.95**	**5.54**

Table 6.3 Summary of watercourses created / enhanced

Habitat type on landscape plan	Metric Habitat Type	Distinctiveness	Condition	Strategic Significance	Delay in Creation	Length	Units Delivered
Realigned highways ditches	Ditches	Medium	Poor	Low	0 years	0.42	0.83
Reinstated ditches post-removal of construction culverts	Ditches	Medium	Moderate	Low	4 years	0.02	0.06
Realigned watercourse around substation	Other rivers and streams	High	Poor	Low	0 years	0.81	1.16
Reinstated watercourse post-removal of construction culverts	Other rivers and streams	High	Poor	Low	4 years	0.01	0.01
Watercourse enhanced by new woodland planting within riparian zone	Other rivers and streams	High	Poor	Low	4 years	0.44	2.32
	Total					**2.5**	**4.38**

Off-site Biodiversity Unit Value

6.2.4 In order to achieve the legally required 10% BNG for habitat and watercourse units, and meet the trading rules for rural trees, off-site units are proposed to be purchased from a third-party provider. The project team for the Scheme has been in contact with local providers of off-site biodiversity units including Green Investment in Greater Lincolnshire (GIGL) which has confirmed the availability of appropriate units for purchase to enable the Scheme to achieve the required 10% BNG for habitat, hedgerow and watercourse units and meet the trading rules. GIGL, through its network of landowners, has units available that are already registered on the Natural England biodiversity gain sites register, with a pipeline of additional units being prepared. Whilst the procurement of units has not yet been finalised this engagement with GIGL indicates availability of suitable biodiversity units local to the Substation Works, demonstrating the feasibility of this approach.

6.2.5 National Grid is developing a procurement exercise that will include identifying third-party providers of off-site biodiversity gains (including BNG) and carbon compensation to support National Grid's portfolio of projects, including major infrastructure projects. This will be procured through a Qualifying Utilities Dynamic Market (QUDM) under the Procurement Act 2023 (Ref 25).

6.2.6 The QUDM is a pre-vetted pool of capable third-party unit providers and works as a dynamic framework where a utility company publishes a notice, providers register and qualify (proving their technical capability). Unit providers will need to demonstrate that biodiversity gain schemes will contribute to wider environmental and societal benefits, including environmental education, learning and skills. National Grid will then be able to invite the qualified members to bid for opportunities, through either spot tenders for individual projects, spot tenders for combined project requirements, or through an overarching framework. Applications to enter the QUDM are anticipated to open in May 2026 and will be advertised on the Government Find a Tender Service.

6.2.7 It is the intention that the Scheme will be able to purchase the required number of biodiversity units to achieve 10% BNG from qualified providers of biodiversity units, via the QUDM.

6.2.8 There is currently a total on-site net unit change of -20.79~~19~~ habitat units, +4.18 hedgerow units, and -2.40 watercourse units. Sufficient units of appropriate distinctiveness therefore are proposed to be purchased in order to ensure at least 10% BNG is delivered, and the trading rules are met. The number of off-site habitat units required will be calculated based on several factors that are not known at this stage, including whether the off-site location would be within the same local planning authority (LPA), National Character Area, or Operational Catchment as the Substation Works.

Summary of Net Changes

6.2.9 As described in **Section 2.1.0**, the TCPA mandates that planning applicants must demonstrate 10% BNG within their proposals. Habitat, hedgerow and watercourse units are not directly comparable with each other and 10% BNG must therefore be achieved across all three unit categories, rather than an overall achievement from summing, trading, or converting between the categories.

6.2.10 **Table 6.4**, **Table 6.5** and **Table 6.6** summarise the total net changes on-site as a result of implementation of the Scheme and proposed planting specification. It is not possible to achieve 10% BNG for habitat, hedgerow and watercourse units through on-site interventions. As such, at least 4.53 watercourse units (of any watercourse type) are proposed to be purchased from a third-party off-site unit provider along with 552.6642 habitat units (of varying distinctiveness) to ensure at least 10% BNG is delivered and the trading rules are met, as described in **Section 6.3**.

Table 6.4 Summary of gains or losses for broad habitat types

BNG habitat type	Net Gain or loss/ha	Net Gain or loss/habitat units
Cropland	-35.47	-75.11
Grassland	2.88	15.78
Woodland and forest	5.31	2421.8258
Individual trees – Rural tree	0.07	0.17
Urban – Developed land; sealed surface	27.28	0
Total	**0.06**	**-34.34**
Excluding individual trees	**0**	

Table 6.5 Summary of gains or losses for hedgerows

BNG habitat type	Net Gain or loss/km	Net Gain or loss/habitat units
Native hedgerow with trees – associated with bank or ditch	0	0
Species-rich native hedgerow	0.95	5.54
Ecologically valuable line of trees	-0.04	-0.34
Native hedgerow	-0.18	-1.01
Line of trees	-0.01	-0.01
Total	**0.72**	**4.18**

Table 6.6 Summary of gains or losses for watercourses

BNG habitat type	Net Gain or loss/km	Net Gain or loss/habitat units
Other rivers and streams	0.1	-1.9
Ditches	-0.003	-0.5
Culverts	-0.008	-0.01
Total	**0.06**	**-2.40**

6.2.11 The BNG contribution achieved by each of the habitat proposals on-site are presented in the headline results from the Statutory Biodiversity Metric (**Image 1**~~Error! Reference source not found.~~).

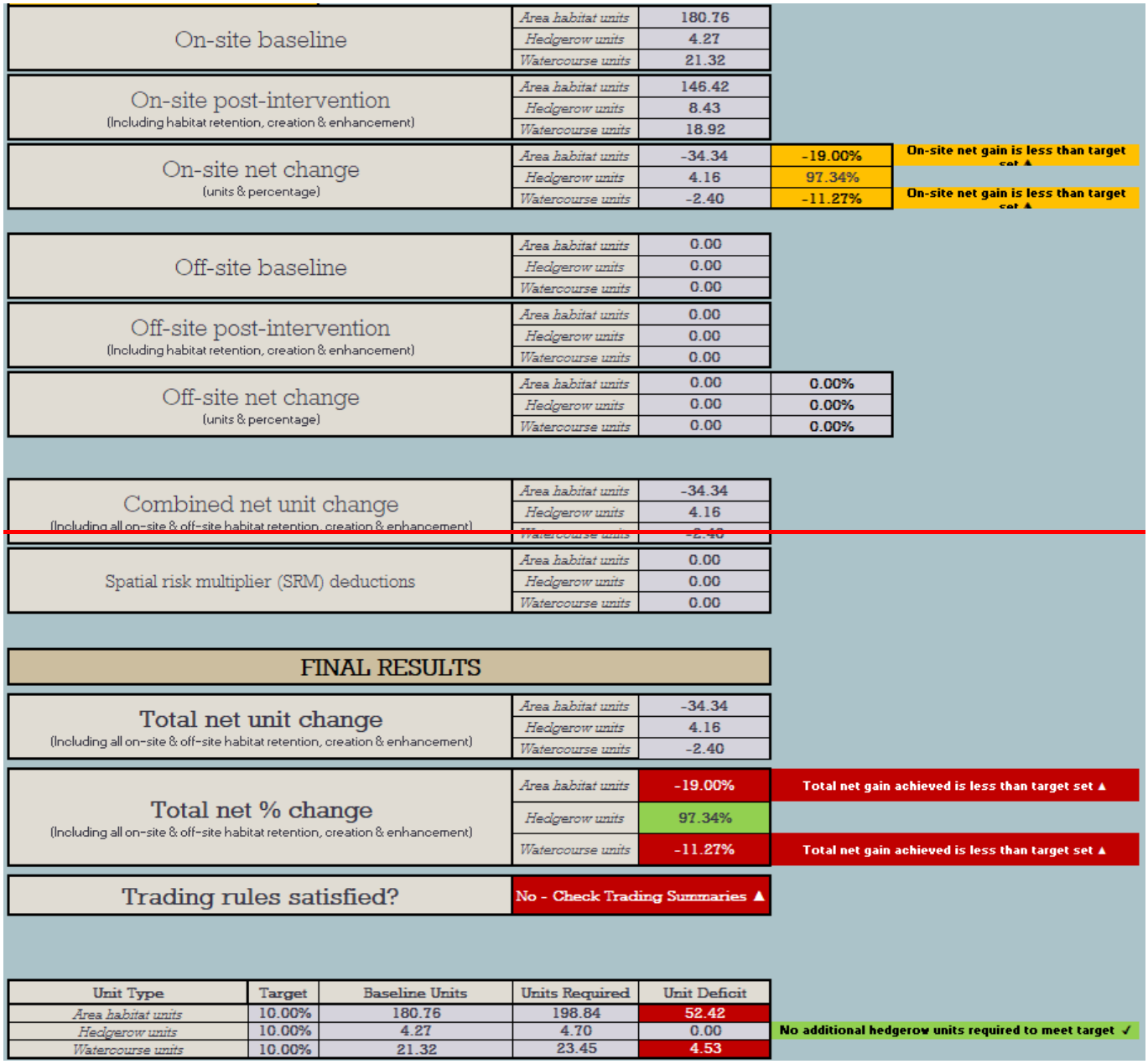
Image 1 Headline results from the Statutory Biodiversity Metric for on-site habitat proposals for the Substation Works.

On-site baseline	*Area habitat units*	180.76		
	Hedgerow units	4.26		
	Watercourse units	21.32		
On-site post-intervention (Including habitat retention, creation & enhancement)	*Area habitat units*	143.18		
	Hedgerow units	8.43		
	Watercourse units	18.92		
On-site net change (units & percentage)	*Area habitat units*	-37.58	-20.79%	On-site net gain is less than target set ▲
	Hedgerow units	4.18	98.08%	
	Watercourse units	-2.40	-11.27%	On-site net gain is less than target set ▲
Off-site baseline	*Area habitat units*	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Area habitat units*	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		
Off-site net change (units & percentage)	*Area habitat units*	0.00	0.00%	
	Hedgerow units	0.00	0.00%	
	Watercourse units	0.00	0.00%	
Combined net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Area habitat units*	-37.58		
	Hedgerow units	4.18		
	Watercourse units	-2.40		
Spatial risk multiplier (SRM) deductions	*Area habitat units*	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		

FINAL RESULTS

Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Area habitat units*	-37.58	
	Hedgerow units	4.18	
	Watercourse units	-2.40	
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	*Area habitat units*	-20.79%	Total net gain achieved is less than target set ▲
	Hedgerow units	98.08%	
	Watercourse units	-11.27%	Total net gain achieved is less than target set ▲
Trading rules satisfied?	No - Check Trading Summaries ▲		

Unit Type	Target	Baseline Units	Units Required	Unit Deficit	
Area habitat units	10.00%	180.76	198.84	55.66	
Hedgerow units	10.00%	4.26	4.68	0.00	No additional hedgerow units required to meet target ✓
Watercourse units	10.00%	21.32	23.45	4.53	



On-site baseline	*Area habitat units*	180.76		
	Hedgerow units	4.27		
	Watercourse units	21.32		
On-site post-intervention (Including habitat retention, creation & enhancement)	*Area habitat units*	146.42		
	Hedgerow units	8.43		
	Watercourse units	18.92		
On-site net change (units & percentage)	*Area habitat units*	-34.34	-19.00%	On-site net gain is less than target set ▲
	Hedgerow units	4.16	97.34%	
	Watercourse units	-2.40	-11.27%	On-site net gain is less than target set ▲
Off-site baseline	*Area habitat units*	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Area habitat units*	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		
Off-site net change (units & percentage)	*Area habitat units*	0.00	0.00%	
	Hedgerow units	0.00	0.00%	
	Watercourse units	0.00	0.00%	
Combined net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Area habitat units*	-34.34		
	Hedgerow units	4.16		
	Watercourse units	-2.40		
Spatial risk multiplier (SRM) deductions	*Area habitat units*	0.00		
	Hedgerow units	0.00		
	Watercourse units	0.00		

FINAL RESULTS			
Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Area habitat units*	-34.34	
	Hedgerow units	4.16	
	Watercourse units	-2.40	
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	*Area habitat units*	-19.00%	Total net gain achieved is less than target set ▲
	Hedgerow units	97.34%	
	Watercourse units	-11.27%	Total net gain achieved is less than target set ▲
Trading rules satisfied?	No - Check Trading Summaries ▲		

Unit Type	Target	Baseline Units	Units Required	Unit Deficit	
Area habitat units	10.00%	180.76	198.84	52.42	
Hedgerow units	10.00%	4.27	4.70	0.00	No additional hedgerow units required to meet target ✓
Watercourse units	10.00%	21.32	23.45	4.53	

6.3 Trading rules

6.3.1 The Statutory Biodiversity Metric incorporates trading rules that set minimum habitat creation and enhancement requirements to compensate for specific habitat losses, up to the point of no net lost, based on the habitat type and distinctiveness (Ref 6). The headline results of the Statutory Biodiversity Metric (see **Image 1~~Error! Reference source not found.~~**) highlight when trading rules have or have not been met. The current trading rules status for each of the habitats impacted by the Substation Works is described below.

6.3.2 There are no very high distinctiveness habitats present on-site.

6.3.3 The only high distinctiveness habitat presents within the Substation Works Site Boundary are other rivers and streams, and native hedgerow with trees – associated with a bank or ditch. The native hedgerow with trees – associated with a bank or ditch will be retained within an area of landscape mitigation. The other river and streams habitat will be lost (-1.87 units) to facilitate the diversion of WC_WM_63 and

the construction of a culvert for construction access on this new diversion. The suggested action within the metric to address this loss is replacement with watercourse units of the same habitat type. As described, there is uncertainty about the future connection requirements into the new Weston Marsh Substation A and potential constraints upon the long-term management of habitats that would be required to achieve good condition or higher distinctiveness habitats. Watercourse units are therefore proposed to be purchased from a third-party off-site unit provider in order to deliver the units required to achieve the 10% gain (i.e. the portion above no net loss) noting that this element above no net loss is not subject to trading rules.

6.3.4 Losses of medium distinctiveness habitats on-site include 0.06 ha of other neutral grassland to facilitate third party services works. The suggested action within the Metric to address these losses is replacement with the same broad habitat type or higher distinctiveness habitat (e.g., loss of scrub should be compensated by scrub creation, not grassland creation). Other neutral grassland creation on-site is primarily driven by landscape integration and screening requirements and can only therefore contribute to no net loss. Habitat units are therefore proposed to be purchased from off-site providers in order to deliver the units required to achieve the 10% gain (i.e. the portion above no net loss) noting that this element above no net loss is not subject to trading rules.

6.3.5 Losses of medium distinctiveness hedgerow units on-site comprise the loss of 40 m of ecologically valuable line of trees to facilitate the construction of the bellmouth and associated visibility splays for the construction haul road junction with Stone Gate. The suggested action within the Metric to address these losses is replacement with the same broad habitat type or higher distinctiveness habitat. Hedgerows have been incorporated along Marsh Road and the northern boundary of the Substation Works, these have been designed as species-rich native hedgerows, that also incorporate heavy standard trees, to increase their biodiversity contribution. The trading rules have therefore been met for medium distinctiveness hedgerow units.

6.3.6 Losses of medium distinctiveness watercourse units comprise ditch habitat (-0.53 units) due to the removal of WC_WM_134 and WC_WM_142 to facilitate road widening, an increase in riparian encroachment of WC_WM_159 to facilitate road widening, the construction of a culvert for construction access and outfall for construction on WC_WM_115, and the construction of a culvert for construction access on WC_WM_212. The suggested action within the metric to address this loss is replacement with watercourse units of the same habitat type. Watercourse units are therefore proposed to be purchased from off-site providers in order to deliver the units required to achieve the 10% gain (i.e. the portion above no net loss) noting that this element above no net loss is not subject to trading rules.

6.3.7 Losses of low distinctiveness habitats (cropland, modified grassland) represent the greatest loss in area units across the Substation Works Site Boundary (-73.98 units). which require replacement by the same distinctiveness habitat or better. Additional losses of low distinctiveness habitats include native hedgerows and line of trees (-1.02 units). Creation of medium distinctiveness habitats, including other neutral grassland, other broadleaved woodland, species-rich native hedgerows and rural trees offset these losses. The trading rules have therefore been met for low distinctiveness habitats. There is a small loss of low distinctiveness watercourse units (-0.01) due to the removal of a culvert on the section of WC_WM_63 that is being diverted around the substation boundary.

6.3.8 Losses of very low distinctiveness habitats represent a small area of the Substation Works Site Boundary (0.74 ha). Any losses of very low distinctiveness habitats do not require compensation.

6.3.9 The trading summary for each habitat type are provided within **Table 6.7.**

Table 6.7 Trading summary

Habitat type	Distinctiveness Group	Unit change	Trading satisfied?
Grassland – Other neutral grassland	Medium	14.65	Yes
Grassland – Modified grassland	Low	1.13	Yes
Cropland – Cereal & non-cereal crops	Low	-75.11	No
Woodland and forest – Other woodland; broadleaved	Medium	2~~4.82~~1.58	Yes
Individual trees – Rural tree	Medium	0.17	Yes
Watercourse type	**Distinctiveness Group**	**Unit change**	**Trading satisfied?**
Other rivers and streams	High	-1.87	No
Ditches	Medium	-0.53	No
Culvert	Low	0.01	No
Hedgerow type	**Distinctiveness Group**	**Unit change**	**Trading satisfied?**
Native hedgerow with trees – associated with bank or ditch	High	0	Yes
Species-rich native hedgerow	Medium	5.54	Yes
Ecologically valuable line of trees	Medium	-0.34	Yes
Native hedgerow	Low	-1.01	Yes
Line of trees	Low	-0.01	Yes

6.4 BNG Good Practice Principles for Development

6.4.1 CIRIA, CIEEM and ISEP (formerly IEMA) developed the UK's first good practice principles for BNG (Ref 23). The good practice principles provide a framework for development projects to show that they are following good practice. A description of how this Scheme (and therefore the Substation Works) adheres to each principle is provided below.

Principle 1 – Application of the Mitigation Hierarchy

6.4.2 Application of the Mitigation Hierarchy has been utilised throughout development of the Scheme via a design change review process. At each key design development

and refinement stage an ecologist has reviewed the design with a particular focus on avoiding or minimising the loss of all habitats of medium distinctiveness or higher. Where interactions with such habitats and the design is identified the ecologist has raised a Design Change Request (DCR); any area in which a construction layer, either temporary or permanent, overlaps with a habitat with medium to very high distinctiveness, was then recorded as an observation or a DCR. The DCR's were then reviewed by the design team, in order to amend the construction alignments to avoid these habitats unless deemed unavoidable.

6.4.3 The DCR process involves reviewing the construction layers of the most recent design refinement for the development against the baseline habitat data collected through survey. Prior to survey data collection a desk-based tool was used to inform avoidance of higher distinctiveness habitats such as the coastal and floodplain grazing marsh located along the River Welland. The desk-based tool amalgamates opensource habitat data and satellite imagery to map habitat types.

Principle 2 – Avoid losing biodiversity that cannot be offset elsewhere

6.4.4 No irreplaceable habitats would be lost or impacted as a result of the Scheme.

Principle 3 – Be inclusive & equitable

6.4.5 Online and in-person public consultation events took place in November and December 2025, to gather feedback to inform the design development.

6.4.6 Due to the nature of the Scheme, it is not possible for on-site habitats to be openly accessible by the public, however the Scheme is seeking to work with off-site BNG unit providers who develop biodiversity driven projects that provide wider environmental and social benefits.

Principle 4 – Address risks

6.4.7 Within the Statutory Biodiversity metric, multipliers are applied to correct for disparity, risk in delivery or uncertainty in the effectiveness of restoration or habitat creation and management techniques. These address the risks associated with the level of difficulty in restoration or creation for different habitats and the temporal risks associated with the time taken for the habitat to reach target condition. The type and condition of the habitats identified for creation within the proposals is achievable within the constraints of the substation location and design.

6.4.8 The draft HMMP included within this report, and associated **Indicative Landscape and Ecological Mitigation Proposals**, represents a 30-year commitment to manage and maintain the proposed on-site habitat types to the agreed condition, from the date of habitat creation completion. A worst-case scenario assumption has been used in relation to when habitat creation would occur relative to the construction programme, and the temporal multiplier for all habitat creation has generally been set to two and a half years within the Statutory Biodiversity Metric to mitigate uncertainty in BNG delivery.

6.4.9 Planting and/or seeding of habitats to be created will occur at the earliest available suitable period following completion of construction. Specialist contractors will be

utilised where appropriate to ensure the successful delivery of the landscaping specifications.

6.4.10 The risk of future development, including anticipated grid connections, into the substation has driven the off-site BNG strategy for this Scheme, recognising the risk of being able to retain, and manage for 30 years, larger areas of on-site BNG provision immediately around the Substation Works Site Boundary.

Principle 5 – Make a measurable Net Gain contribution

6.4.11 Through on-site habitat creation, and the proposed purchase of off-site units, the minimum 10% BNG for habitat, hedgerow and watercourse units would be met.

Principle 6 – Achieve the best outcomes for biodiversity

6.4.12 Delivery of positive biodiversity outcomes has been maximised on-site where possible, to ensure delivery of biodiversity benefits within close proximity to the losses. For example, the creation of extensive areas of woodland planting around the substation will significantly increase the woodland provision within the immediate vicinity of Weston Marsh in the long term.

6.4.13 Off-site biodiversity units are proposed to be purchased from expert conservation bodies. Through such unit providers the Scheme will ensure that BNG requirements can be met in a way that delivers robust, measurable and long-term benefits for nature while aligning with National Grid commitments to wider environmental and societal benefits.

Principle 7 – Be additional

6.4.14 Due to the constrained nature of the Substation Works' Site Boundary, with future grid connection requirements to the substation, habitat creation measures have been limited to those required to be provided on-site for other environmental purposes such as landscape screening or relating to protected species. Efforts have been made however to optimise the ecological value of the landscape driven habitat creation, by inclusion of species-rich native planting mixes in keeping with those species present within the local landscape. The Scheme is seeking to achieve 10% BNG through purchase of off-site units from third-party biodiversity unit providers that deliver wider environmental and societal benefits. In doing so providing outcomes that demonstrably exceed the biodiversity focused outcomes of the 10% BNG obligations.

Principle 8 – Create a Net Gain legacy

6.4.15 This report sets out a draft 30-year Habitat Management and Monitoring Plan (see **Section 7~~31~~**) for the on-site habitat proposals associated with the Substation Works, including defined roles and responsibilities for enacting this plan. This mechanism will secure the long-term legacy of BNG benefits associated with the Substation Works, particularly an increase in the prevalence of semi-natural habitats in a largely arable landscape context.

6.4.16 National Grid are developing a QUDM process for off-site BNG unit provision. Third-party unit providers will need to demonstrate that biodiversity gain schemes will

contribute to wider environmental and societal benefits, including environmental education, learning and skills.

Principle 9 – Optimise sustainability

6.4.17 The Scheme is an important component of the wider Great Grid Upgrade which comprises major infrastructure projects that are connecting more clean, secure energy to homes and businesses across England and Wales. The Great Grid Upgrade ensures that the infrastructure is in place to support the UK's move away from fossil fuels and increasing clean energy generation. Demand for electricity is expected to increase by 50% by 2035 and double by 2050.

Principle 10 – Be transparent

6.4.18 As described the Scheme proposals have been developed through public consultation and engagement with stakeholders.

6.4.19 The methodology, results, and design process have been reported transparently within this document.

7. Draft Habitat Management & Monitoring Plan

7.1.1 This section outlines the draft long-term management measures and monitoring requirements for each of the proposed habitat creation and enhancement measures set out throughout **Section 6** that are included within the Substation Works and accounted for in the post development calculation. A detailed HMMP will be conditioned as part of the Planning Application.

7.1.2 To ensure the actions outlined in the HMMP are achievable and measurable, proposals have been developed to align closely with the condition scoring criteria set out in the Statutory Biodiversity Metric. The condition scoring criteria within the Statutory Biodiversity Metric will consequently be utilised to monitor the establishment of these habitats to their target type and condition (see **Appendix D**).

7.1.3 National Grid or their appointed contractor will undertake all on-site habitat creation proposals associated with construction of the Substation Works, as set out in **Section 6**. Following the initial creation and establishment phases of each on-site habitat, long-term management will pass to National Grid's operational land management team or their appointed contractor.

7.1.4 A draft schedule outlining the management prescriptions, monitoring frequency, and responsible parties for undertaking the actions detailed within this draft HMMP are provided within **Appendix E**. Tables detailing the defined monitoring criteria in relation to each discrete habitat area discussed throughout the draft HMMP, are provided within **Appendix D**.

7.1.5 Each of the management prescriptions detailed in the draft HMMP post-establishment will be undertaken by National Grid operational land management team or their appointed contractor. To align with standard BNG requirements, the draft HMMP is set over a minimum period of 30 years. The draft HMMP covers management and monitoring requirements for the on-site habitat creation contributions to BNG only, off-site gains will be covered by separate HMMP prepared by the third-party off-site unit providers.

7.2 Grassland – Modified grassland

Management regime

7.2.1 For areas of created modified grassland, located along the verge of Marsh Road and base of hedgerows at the entrance to the substation access road, establishment is likely to be rapid, using standardised amenity grassland seed mixes. Management of such areas will be following a regular mowing regime. As the functional purpose of this habitat type is for amenity value rather than as a significant biodiversity resource, there will be limited opportunities to vary sward height, create bare ground or to remove arisings resulting from mowing, to increase species richness. It is considered likely that the modified grassland will be free of scrub, bracken, and invasive non-native species (INNS) (subject to appropriate INNS management measures during

construction), with minimal physical damage, therefore achieving moderate condition is realistic.

Monitoring

7.2.2 Given the modified grassland will not be managed as a potential biodiversity resource, monitoring would be focussed on identification of encroachment of undesirable species that would impact the grassland's amenity value and is anticipated to be undertaken alongside the regular mowing.

7.3 Grassland – Other neutral grassland

Management regime

7.3.1 The other neutral grassland, within the SuDS basins and adjacent to the realigned drainage ditch, will be sown with an appropriate wet meadow seeding mix as detailed within the **Indicative Landscape and Ecological Mitigation Proposals**. It is proposed that the basins be finished with low fertility topsoil to limit dominant plant species and encourage establishment of a diverse species sward. For the first year following seeding, the wildflower areas would be maintained at an approximately 100 mm height to reduce the dominance of coarse grasses and allow perennial wildflowers to establish.

7.3.2 From the following year, management of the grassland areas will be undertaken on an annual cyclical basis, aiming to create and subsequently maintain conditions at a favourable low nutrient state to establish a species-rich sward with wildflowers. Annual cutting will be undertaken each year in July, allowing a wide range of species to flower and shed seed prior to the cutting. Cut material must again be removed to create and maintain the low nutrient environment required for the target habitat, rather than recycling nutrients through decaying thatch. The collected arisings can be stored as a compost heap to remove costs of disposing off-site. A further cut later in the year (end of September) can be undertaken as needed to further reduce soil nutrients and preventing the establishment of undesirable species such as thistles *Cirsium spp*. Again, arisings would be removed and composted.

7.3.3 During the earlier periods of establishment, significant growth of vigorous or undesirable species may develop early in the season. In this circumstance, it may be beneficial to take a further cut prior to the main flowering season (March), again removing the arisings to prevent nutrient recycling. Undesirable species may also be controlled by hand (pulling, digging or cutting) depending on the species and the level of the problem, requirement to be determined through monitoring. Such species include thistles, docks *Rumex spp*. and nettle *Urtica dioica.* Bracken, bramble and INNS have the potential to grow in this habitat and therefore, if present, appropriate removal would take place. It is considered likely that the cutting regime would prevent encroachment of scrub, and other undesirable species, the grassland would be managed sensitively to avoid physical damage, and that a species rich sward with height variation could be achieved. It is therefore realistic that all types of other neutral grassland will achieve a moderate condition.

Monitoring

7.3.4 Monitoring of each neutral grassland area will be undertaken by National Grid representatives, undertaken yearly for five years post-construction, and then once every 5 years from that point until the end of the 30 year monitoring period. Monitoring would be undertaken before the July cut to allow accurate species identification.

7.4 Woodland - Other woodland; broadleaved

Management

7.4.1 Woodland whips of a variety of native tree species will be planted within the created woodland located throughout the Substation Works Site Boundary, for the purpose of filtering and screening for the new Weston Marsh Substation A. Woodland edge planting comprising native tree and shrub species will also be created alongside the woodlands to achieve a diversity of structure. The location of this planting is detailed within the **Indicative Landscape and Ecological Mitigation Proposals**. Management measures to ensure appropriate establishment include:

1) Tree protection installation around suitable whips until appropriate to remove;
2) Where undesirable species occur, these would be removed by hand where possible. If this is not possible appropriate herbicide would be applied;
3) Removal of any unhealthy or dead whips and replacement with plants of a similar size to those adjacent, during the next available planting season (November to March inclusive);
4) Watering of plants to ensure moisture levels are maintained appropriate for optimum growth; and
5) Selective thinning every 5 years (September to March inclusive) to ensure structural variation.

7.4.2 Following establishment, relatively little management is required although selective thinning would aim to achieve structural variation and remove unhealthy trees. The appropriate control and removal of any INNS and other undesirable plant species which establish would also be undertaken through recognised methods. This will be undertaken by appropriately trained staff or their appointed specialist contractors.

7.4.3 It is considered likely that the native species diversity will remain high following successful planting and ongoing maintenance, that there is a low risk of invasive species such as Rhododendron and cherry laurel encroaching, that deer browsing pressure will not be significant, and that tree health can be maintained through appropriate monitoring and management. It is therefore realistic that the other broadleaved woodland will achieve moderate condition.

Monitoring

7.4.4 Monitoring of the other broadleaved woodland will be undertaken by National Grid representatives, undertaken annually for five years post-construction, and then once every 5 years from that point until the end of the 30 year monitoring period. Monitoring would be undertaken in spring or early summer, to determine that whips

have survived the winter and secondly to identify any INNS or undesirable species, and location for appropriate thinning activities.

7.5 Individual trees – Rural trees

Management

7.5.1 Individual trees (whips and standards) will be planted along Marsh Road adjacent to the new Weston Marsh Substation A access track. The location of this planting is detailed within the **Indicative Landscape and Ecological Mitigation Proposals**. Management measures to ensure appropriate establishment include:

1) Tree protection installation around whips and standards, with inspection to ensure protection measures are functioning and appropriate time is identified to remove (i.e. so as not to restrict growth);
2) Competing vegetation growth around the base of establishing trees would be supressed with appropriate mulching or matting. Where undesirable species occur, these would be removed by hand where possible. If this is not possible appropriate herbicide would be applied;
3) Removal of any unhealthy or dead trees and replacement with plants of a similar size to those adjacent, during the next available planting season (November to March inclusive); and
4) Watering of plants to ensure moisture levels are maintained appropriate for optimum growth.

7.5.2 Following establishment, relatively little management is required although appropriate pruning may be required in later years. The appropriate control and removal of any of INNS and other undesirable plant species which establish would also be undertaken through recognised methods. This will be undertaken by appropriately trained National Grid staff or their appointed specialist contractors.

7.5.3 It is considered likely that the native species diversity will remain high following successful planting and ongoing maintenance, that there is a low risk of invasive species such as Rhododendron and cherry laurel encroaching, that deer browsing pressure will not be significant, and that tree health can be maintained through appropriate monitoring and management. It is therefore realistic that the other broadleaved woodland will achieve moderate condition.

7.5.4 The rural tree planting will comprise native species, it is considered likely that through the appropriate aftercare the tree canopy will establish to be predominantly continuous, and given the location the risk of adverse impacts from human activity (vandalism, herbicide application, intensive agricultural practices) is low. It is therefore realistic that the rural trees will achieve moderate condition.

Monitoring

7.5.5 Monitoring of the rural trees will be undertaken by National Grid representatives, undertaken annually for five years post-construction, and then once every 5 years from that point until the end of the 30 year monitoring period. Monitoring would be undertaken in spring or early summer, to determine that whips have survived the winter and secondly to identify any INNS or undesirable species.

7.6 Hedgerow - Species-rich native hedgerow

Management

7.6.1 Hedgerows will be planted as detailed within the **Indicative Landscape and Ecological Mitigation Proposals**. Management measures to ensure appropriate establishment include:

1) Competing vegetation growth around the base of establishing trees would be supressed with appropriate mulching or matting. Where undesirable species occur, these would be removed by hand where possible. If this is not possible appropriate herbicide would be applied;
2) Removal of any unhealthy or dead hedgerow shrubs and replacement with plants of a similar size to those adjacent, during the next available planting season (November to March inclusive) to maintain hedge canopy continuity;
3) Watering of plants to ensure moisture levels are maintained appropriate for optimum growth; and
4) A sensitive hedgerow cutting regime, with cuts undertaken every 2-3 years in order to encourage flowering and fruiting and to reduce damage from excessive hedgerow management.

7.6.2 Following establishment, a cut every 2-3 years would be undertaken, this would be undertaken outside the nesting bird period (March to August inclusive). The appropriate control and removal of any of INNS and other undesirable plant species which establish would also be undertaken through recognised methods. This will be undertaken by appropriately trained National Grid staff or their appointed specialist contractors.

7.6.3 Hedgerows will be managed to be at least 1.5 m height and at least 1.5 m width, with gaps minimised, and maintained free of invasive species. Management will be undertaken sensitively to avoid damaging the structure. It is therefore realistic that the species-rich native hedgerow will achieve moderate condition.

Monitoring

7.6.4 Monitoring of the species-rich native hedgerow will be undertaken by National Grid representatives, undertaken annually for five years post-construction, and then once every 5 years from that point until the end of the 30 year monitoring period. Monitoring would be undertaken in spring or early summer, to determine that plants have survived the winter and secondly to identify any INNS or undesirable species.

8. Conclusions and Next Steps

8.1.1 The habitats recorded across the Substation Works Site Boundary comprised predominantly cropland, with areas of modified and other neutral grassland, other broadleaved woodland, species-rich native hedgerows, lines of trees, ditches and developed land. The range of habitats on-site were of varying distinctiveness and condition and were identified within the **EcIA Report** for the Scheme to have potential to support several protected and notable species.

8.1.2 The calculation completed within the Statutory Biodiversity Metric established that the baseline represents 180.76 habitat units (comprising 89.40 ha), 4.26 hedgerow units (comprising 4.27 km) and 21.32 watercourse units (comprising 4.35 km) in total. No irreplaceable habitats, which would require exclusion from the Metric, were identified during the desk study or field survey.

8.1.3 The post-intervention calculation established that the Substation Works, and proposed planting specification, would result in a total of 1436.1842 habitat units, 8.43 hedgerow units and 18.92 watercourse units. Overall, this represents a net change of -374.5843 habitat units (-20.7919%), 4.18 hedgerow units (+98.08%) and -2.40 watercourse units (-11.27% net change). The legally required 10% BNG would therefore not be met on-site for habitat units or watercourse units.

8.1.4 In order to achieve the legally required 10% BNG for habitat, hedgerow and watercourse units, and meet the trading rules, 552.6642 habitat units (Low distinctiveness or better) and 4.53 watercourse units (high and medium distinctiveness) are proposed to be purchased from third-party off-site unit providers. The project team for the Scheme has been in contact with local providers of off-site biodiversity units including GIGL which has confirmed the local availability of appropriate units for purchase. Off-site biodiversity units would be procured through National Grid's Qualifying Utilities Dynamic Market (QUDM). A preference will be given to units that can be purchased locally to Weston Marsh. The criteria for unit providers to be listed on the QUDM includes a requirement to demonstrate benefits such as environmental education, learning and skills. National Grid is therefore committed to delivering BNG for the Substation Works that has benefits for local biodiversity and wider environmental and social benefits.

8.1.5 A Biodiversity Gain Plan must be submitted to the LPA following the granting of planning permission, in order to discharge the statutory Biodiversity Gain condition. TThe Biodiversity Gain Plan must include must include details of application of the mitigation hierarchy, the pre-development biodiversity value of on-site habitat, the post-development value of the on-site habitat, details of any registered off-site biodiversity gain allocated to the development, and details of any biodiversity credits purchased for the development. To discharge the Biodiversity Gain condition, the Local Planning Authority will need to be satisfied that the off-site units allocated to the project through the QUDM are registered on the Biodiversity Gain Sites Register, and therefore subject to a HMMP and legally secured and subject to management for a minimum of 30 years. To discharge the Biodiversity Gain Condition, the Local Planning Authority will also need to be satisfied that the on-site habitat creation / enhancement measures proposed will be maintained for 30 years, and this would usually be achieved through submission of a HMMP.

8.1.6 A Draft HMMP has been produced within this report that includes monitoring and management measures to ensure that target habitat types and conditions are achieved for on-site habitats. The HMMP is currently in draft form, as it is an iterative document, which will require updating at later stages of the Scheme (e.g., upon further design refinement and appointment of a contractor), it is anticipated that preparation of a final HMMP for the on-site habitat units will be a condition of the Planning Application. Tailored management and monitoring of off-site habitats would be the responsibility of the third-party off-site unit providers.

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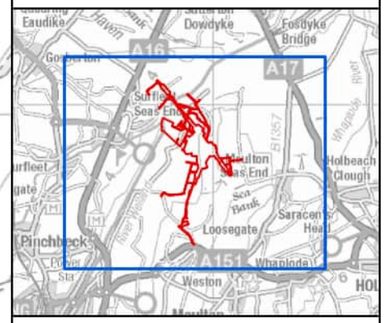
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Figures

Figure 1 Scheme Site Boundary

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LEGEND



Legend

- Scheme Site Boundary
- Substation Works Site Boundary
- S37 OHL Works Site Boundary
- Exempt Overhead Line Works Site Boundary
- S37 - 4ZM - OHL Works Site Boundary
- S37 - 2WS - OHL Works Site Boundary

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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

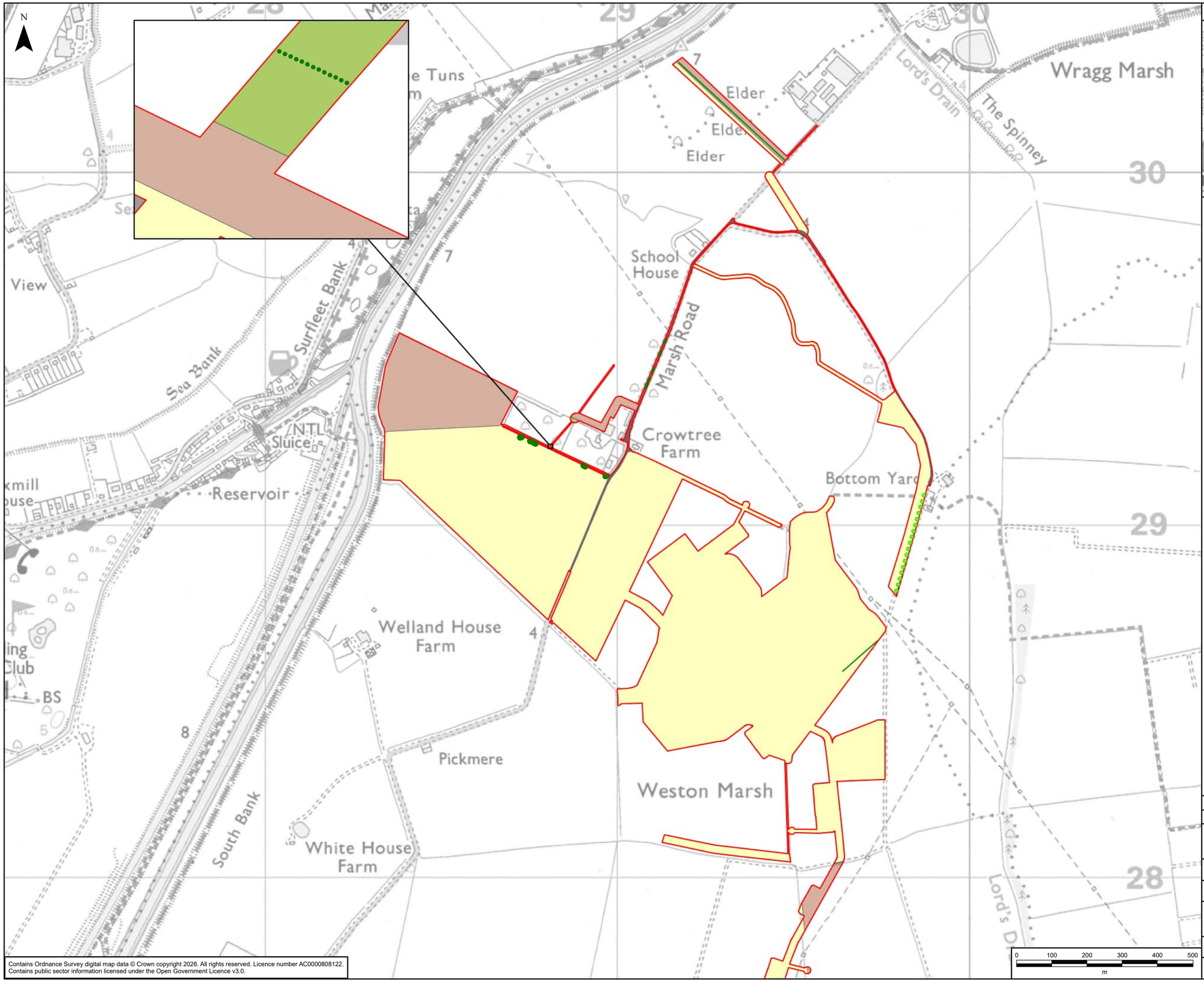
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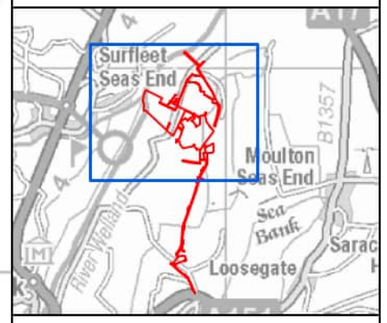
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Figure 2.1 Baseline Biodiversity Net Gain Assessment



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LEGEND



Legend

- Substation Works Site Boundary

UK Habitats - Baseline

- Trees
- Line of trees
- Ecologically valuable line of trees
- Native hedgerow
- Native hedgerow with trees - associated with bank or ditch
- Cropland - Cereal crops
- Cropland - Non-cereal crops
- Grassland - Other neutral grassland
- Urban - Bare ground
- Urban - Built linear features
- Urban - Developed land; sealed surface

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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

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N

Nursery

Marsh House Farm

Top Yard

Lord's Drain

Dominorum Drain

St Lambert's Hall

St Lambert's Cottages

Shepherds Farm

Wykeham Farm

Wykeham Chapel (remains of)

Stone Gate

Hall Gate

Wiseman's Gate

Chestnut House

Wimberley Hall Farm

Low Gate

d's Lane

28

27

26

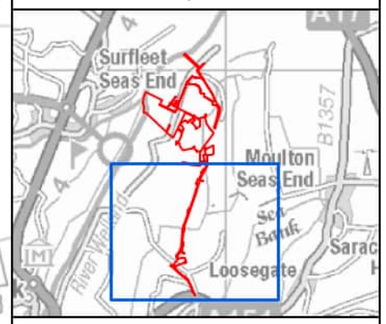
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Legend

Substation Works Site Boundary

UK Habitats - Baseline

Ecologically valuable line of trees

Cropland - Cereal crops

Cropland - Non-cereal crops

Urban - Developed land; sealed surface

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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

Document Title: FIGURE 2.1 BASELINE BIODIVERSITY NET GAIN ASSESSMENT

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Figure 2.2 Baseline Watercourse Biodiversity Net Gain Assessment

N

29

30

Wragg Marsh

Elder

Elder

Elder

Lord's Drain

The Spinney

School House

Marsh Road

Crowtree Farm

Bottom Yard

WC_WM_46

WC_WM_63

WC_WM_51

WC_WM_56

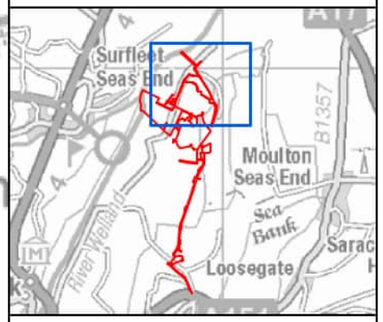
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LEGEND



Legend

Substation Works Site Boundary

Baseline Level of Riparian Encroachment

Major

TCPA Watercourses

Ditches

Other Rivers and Streams

Culvert

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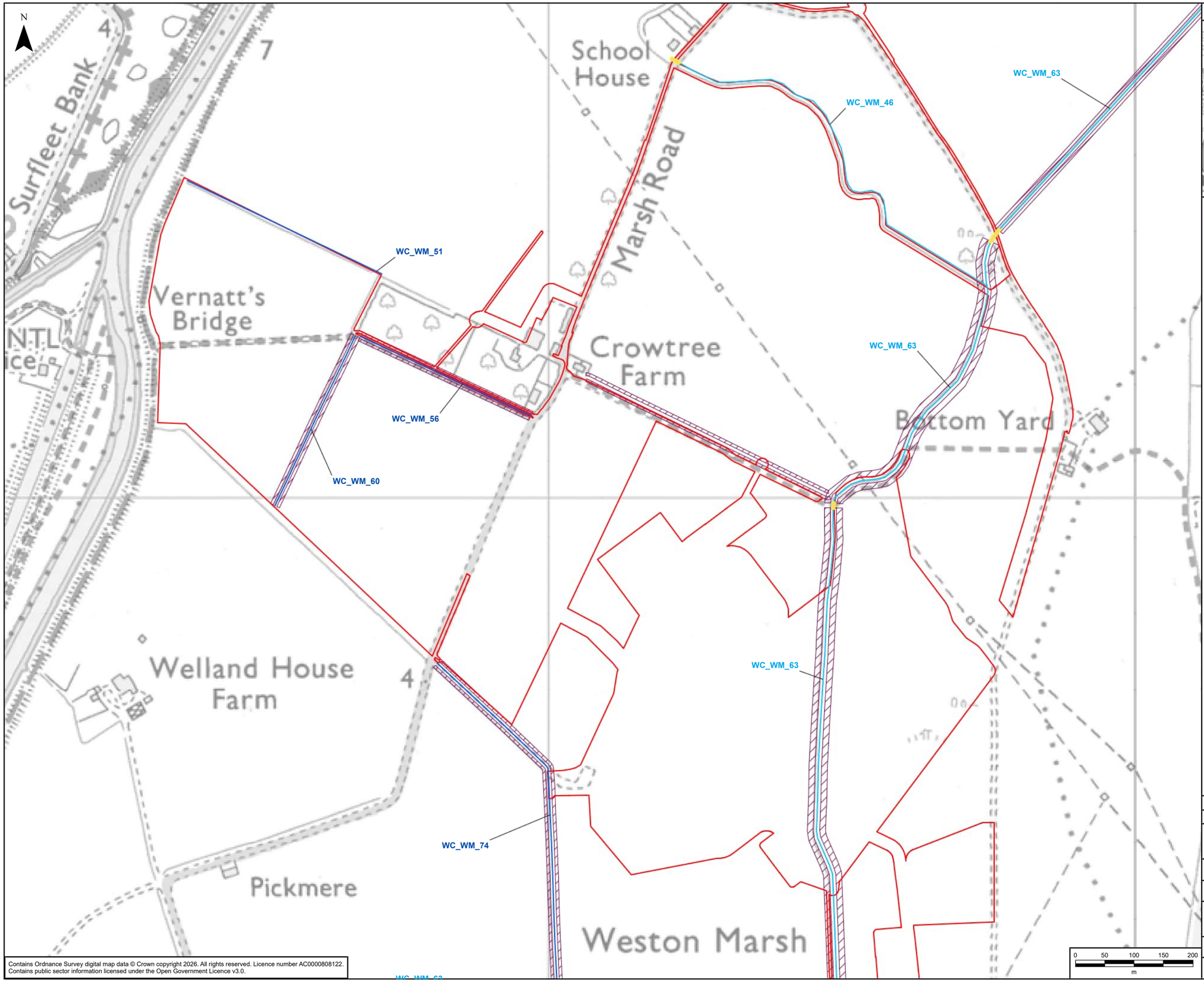
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Document Title: FIGURE 2.2 BASELINE WATERCOURSE BIODIVERSITY NET GAIN ASSESSMENT

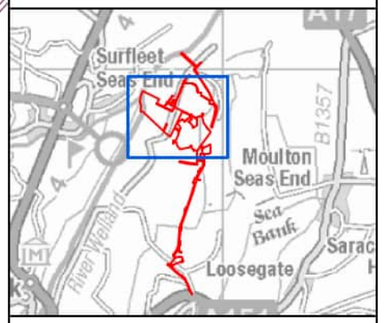
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LEGEND



Legend

- Substation Works Site Boundary

Baseline Level of Riparian Encroachment

- Major

TCPA Watercourses

- Ditches
- Other Rivers and Streams
- Culvert

Rev	Date	Description	GIS	Chk	App
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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

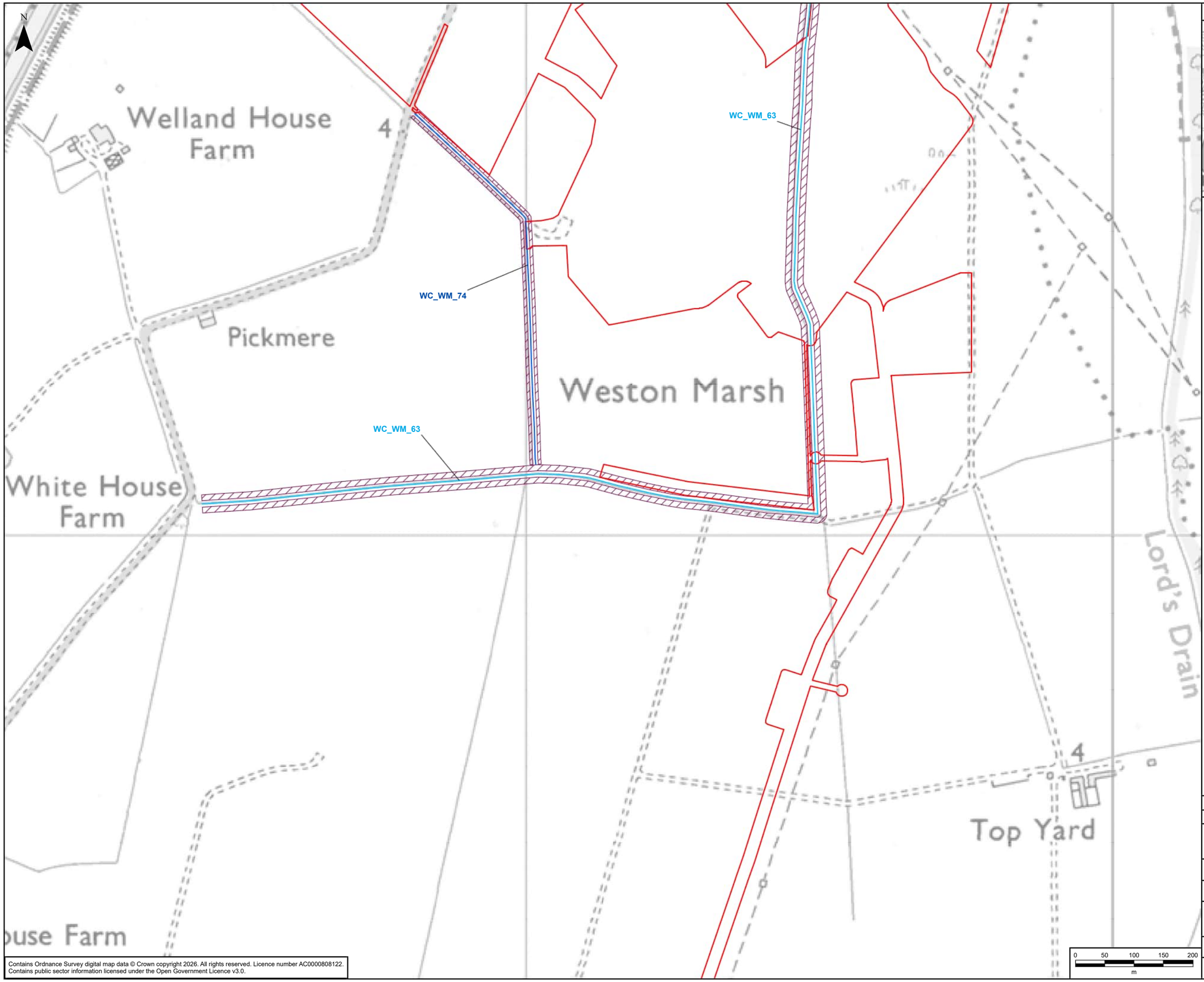
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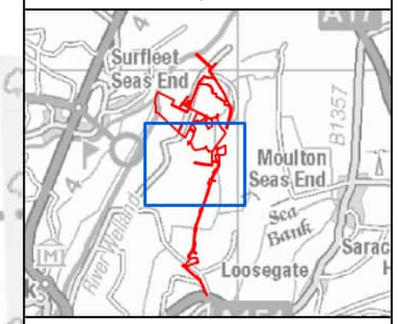
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LEGEND



Legend

- Substation Works Site Boundary

Baseline Level of Riparian Encroachment

- Major

TCPA Watercourses

- Ditches
- Other Rivers and Streams

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N

Top Yard

ouse Farm

3

6

WC_WM_69

WC_WM_115

WC_WM_212

WC_WM_129

St Lambert's Hall

St Lambert's Cottages

hepherds Farm

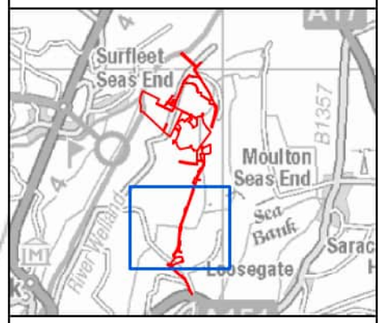
Stone Gate

Hall Gate

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0 50 100 150 200
m

LEGEND



Legend

Substation Works Site Boundary

Baseline Level of Riparian Encroachment

Major

TCPA Watercourses

Ditches

Other Rivers and Streams

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N

WC_WM_115

WC_WM_212

WC_WM_129

WC_WM_134

WC_WM_142

WC_WM_159

St Lambert's Hall

St Lambert's Cottages

Hall Gate

Stone Gate

Wiseman's Gate

Chestnut House

Wimberley Hall Farm

White House Farm

Cross

PO

Weston

Allot Gdns

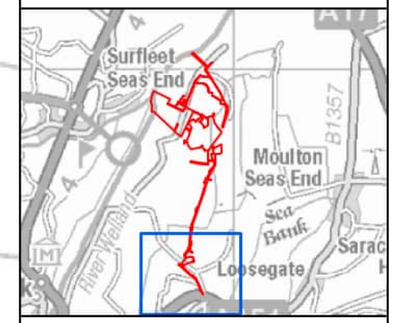
hepherds Farm

Mere Drain

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0 50 100 150 200
m

LEGEND



Legend

Substation Works Site Boundary

Baseline Level of Riparian Encroachment

Major

No Encroachment

TCPA Watercourses

Ditches

Rev	Date	Description	GIS	Chk	App
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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

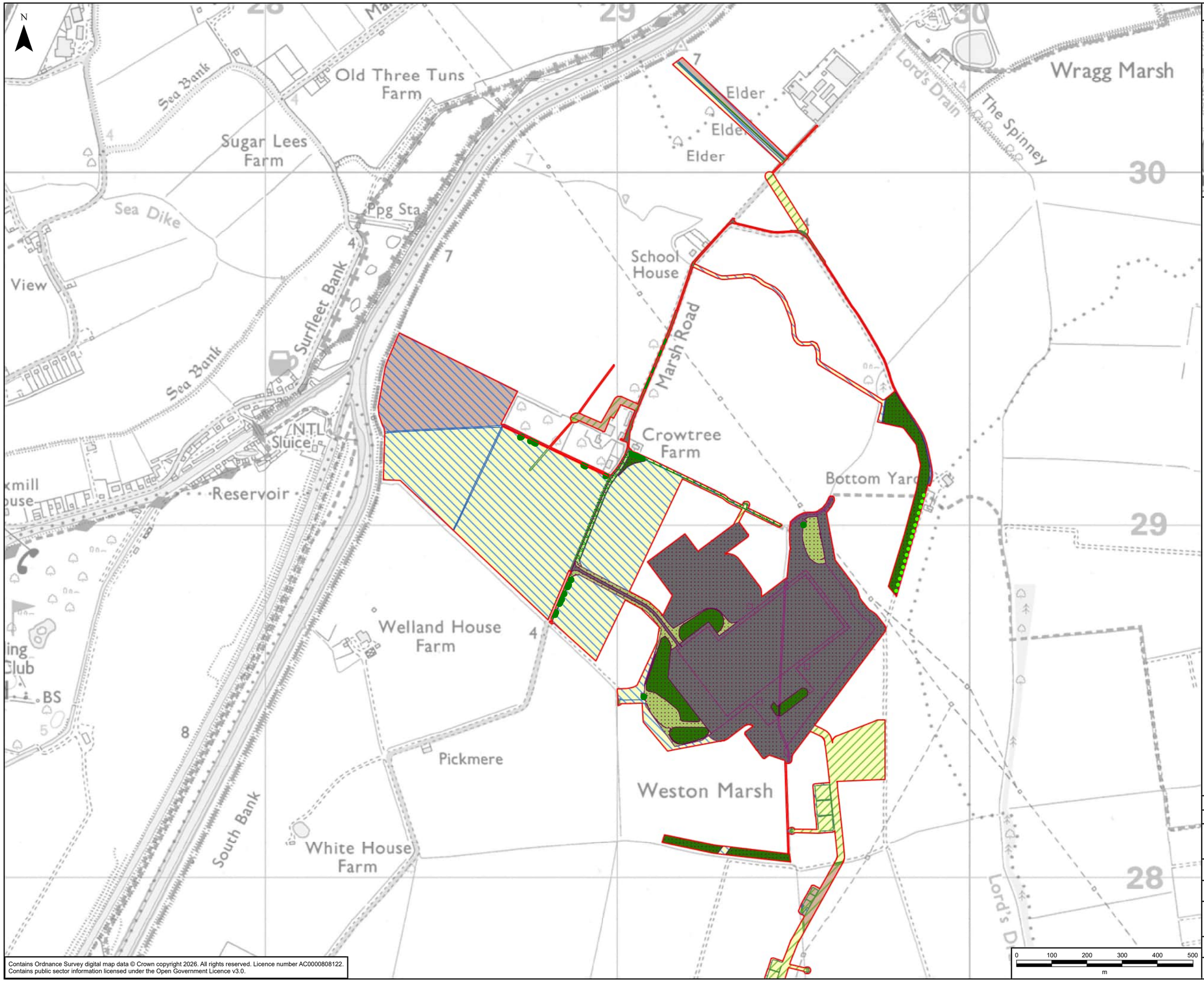
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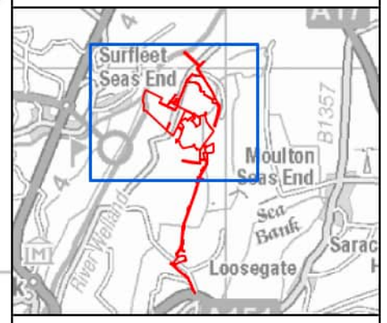
Figure 3.1 Post Development Biodiversity Net Gain Assessment



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0 100 200 300 400 500
m

LEGEND



Legend

- Substation Works Site Boundary

UK Habitats - Post Development

- Trees
- Ecologically valuable line of trees
- Native hedgerow
- Species-rich native hedgerow
- Cropland - Cereal crops
- Cropland - Non-cereal crops
- Grassland - Modified grassland
- Grassland - Other neutral grassland
- Urban - Bare ground
- Urban - Built linear features
- Urban - Developed land; sealed surface
- Woodland and forest - Other woodland; broadleaved

UK Habitats - Post Development Retension

- Lost & Created
- Lost & Reinstated
- Retained

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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

Document Title: FIGURE 3.1 POST-DEVELOPMENT BIODIVERSITY NET GAIN ASSESSMENT

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N

Nursery

Marsh House Farm

Top Yard

Lord's Drain

Dominorum Drain

28

27

26

4

6

3

g Marsh

Wykeham Chapel (remains of)

Wykeham Farm

Shepherds Farm

Stone Gate

St Lambert's Hall

St Lambert's Cottages

Hall Gate

Wiseman's Gate

Chestnut House

Wimberley Hall Farm

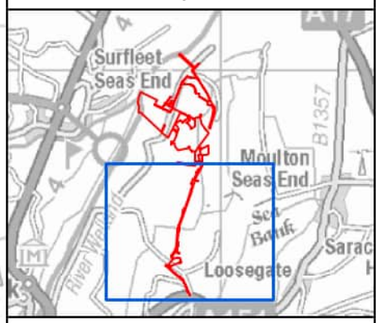
Low Gate

d's Lane

0 100 200 300 400 500

m

LEGEND



Legend

Substation Works Site Boundary

UK Habitats - Post Development

Cropland - Cereal crops

Cropland - Non-cereal crops

Urban - Developed land; sealed surface

Woodland and forest - Other woodland; broadleaved

UK Habitats - Post Development Retension

Lost & Created

Lost & Reinstated

Retained

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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

Document Title: FIGURE 3.1 POST-DEVELOPMENT BIODIVERSITY NET GAIN ASSESSMENT

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Figure 3.2 Post Development Watercourse Biodiversity Net Gain Assessment

N

Elder

Elder

Elder

Lord's Drain

The Spinney

Wragg

School House

Marsh Road

Crowtree Farm

Bottom Yard

WC_WM_46

WC_WM_63

WC_WM_51

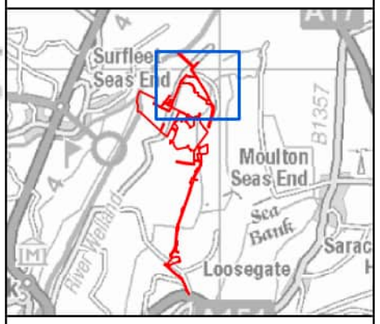
WC_WM_56

WC_WM_63

0 50 100 150 200
m

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LEGEND



Legend

Substation Works Site Boundary

Construction Impacts

Areas Impacted by Construction

Permanent Drainage Diversion

Environmental Mitigation

Woodland Planting - Substation Screening

Habitats

Retained Habitat

Created Habitat

Lost Habitat

Enhanced Habitat

TCPA Watercourses

Ditches

Other Rivers and Streams

Culvert

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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

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N

WC_WM_46

WC_WM_51

WC_WM_60

WC_WM_56

WC_WM_63

WC_WM_63

WC_WM_74

Vernatt's Bridge

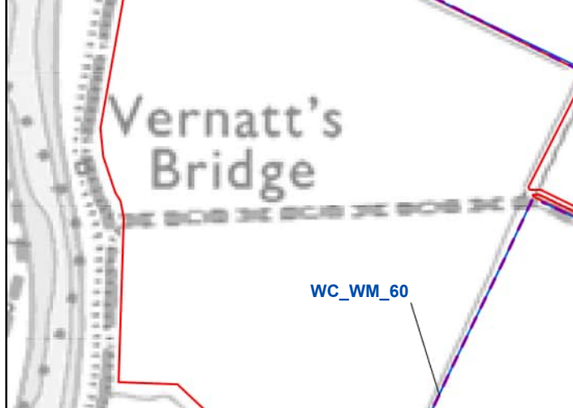
Marsh Road

Crowtree Farm

Bottom Yard

Welland House

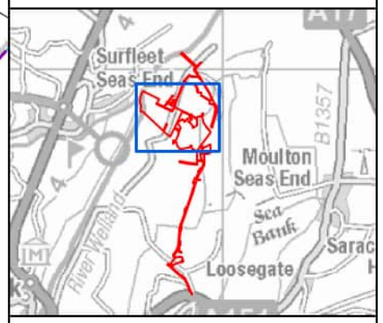
4



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0 50 100 150 200
m

LEGEND



Legend

Substation Works Site Boundary

Construction Impacts

Construction Access Swathe - 8m Wide Culvert

Areas Impacted by Construction

Permanent Drainage Diversion

Environmental Mitigation

Woodland Planting - Substation Screening

Habitats

Retained Habitat

Created Habitat

Lost Habitat

Enhanced Habitat

TCPA Watercourses

Ditches

Other Rivers and Streams

Culvert

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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

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N

Welland House Farm

Pickmere

Weston Marsh

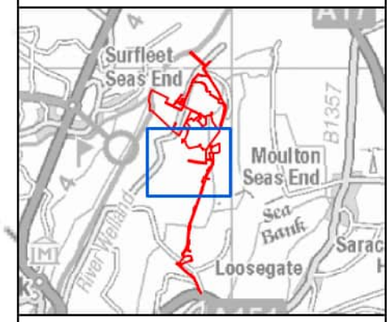
Top Yard

WC_WM_63

WC_WM_74

WC_WM_63





LEGEND

Legend

Substation Works Site Boundary

Construction Impacts

Construction Access Swathe - 8m Wide Culvert

Areas Impacted by Construction

Permanent Drainage Diversion

Environmental Mitigation

Woodland Planting - Substation Screening

Habitats

Retained Habitat

Created Habitat

Lost Habitat

Enhanced Habitat

TCPA Watercourses

Ditches

Other Rivers and Streams

Culvert

0 50 100 150 200
m

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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

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N

WC_WM_69

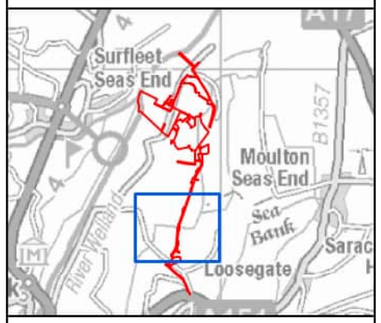
WC_WM_115

WC_WM_212

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0 50 100 150 200
m

LEGEND



Legend
- Substation Works Site Boundary

Construction Impacts
- Construction Access Swathe - 8m Wide Culvert
- Areas Impacted by Construction
- Construction Outfall

Habitats
- Retained Habitat
- Created Habitat

TCPA Watercourses
- Ditches
- Other Rivers and Streams

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Purpose: BIODIVERSITY NET GAIN

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N

WC_WM_115

WC_WM_212

WC_WM_129

WC_WM_134

WC_WM_142

WC_WM_159

ds Farm

Stone Gate

St Lambert's Cottages

Hall Gate

Wiseman's Gate

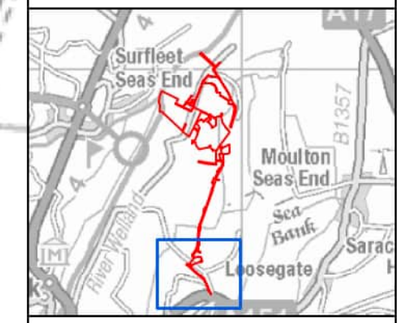
Chestnut House

Wimberley Hall Farm

White Farm

Cross





LEGEND

Legend

Substation Works Site Boundary

Construction Impacts

Construction Access Swathe - 8m Wide Culvert

Road Widening

Areas Impacted by Construction

Riparian Encroachment – No Encroachment

Change in Riparian Encroachment – from No Encroachment (Baseline) to Major Encroachment

Construction Outfall

Habitats

Retained Habitat

Created Habitat

Lost Habitat

TCPA Watercourses

Ditches

0 50 100 150 200
m

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Purpose: BIODIVERSITY NET GAIN

Scheme: PROPOSED ELECTRICITY SUBSTATION AND OVERHEAD LINE WORKS AT WESTON MARSH

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Appendix A Watercourse Biodiversity Net Gain (BNG) Assessment

A.1. Introduction

A.1.1. This appendix focuses exclusively on watercourses (including ditches), describing the methodologies used to determine their ecological condition and detailing how the Statutory Biodiversity Metric (hereafter referred to as 'the metric') calculation was undertaken.

A.1.2. The Statutory Biodiversity Metric User Guide (Ref 30), hereafter referred to as 'the guide', is used to classify the watercourse types that are assessed within the metric. Further information on these classifications can be found from **Paragraph A.3.6** onwards.

A.1.3. In this appendix, 'watercourse(s)' refers to both ditches and other rivers and streams. These are the only two watercourse types within the Substation Works Site Boundary.

A.2. Study Area

A.2.1. The Substation Works Site Boundary comprises a network of watercourses within a rural, intensively managed agricultural landscape. Within this setting, many channels have been historically straightened, reprofiled, and engineered to facilitate land drainage. As a result, natural geomorphological characteristics have often been significantly altered or lost, making it difficult to clearly distinguish between natural watercourses (i.e. rivers and streams) and artificially created drainage ditches.

A.2.2. Accordingly, a precautionary and evidence-based approach was adopted to classify watercourse types, drawing on historic mapping, field survey observations, and professional judgement. Using this approach, 19 watercourses were identified for BNG assessment. Three of these watercourses were classified as rivers or streams, while sixteen were identified as ditches.

A.2.3. The baseline condition of the watercourses was established using either a River Condition Assessment (RCA) or a Ditch Condition Assessment (DCA), as appropriate. The methodologies applied in undertaking these assessments are described in **Paragraph A.3.18** and **Paragraph A.3.32** onwards.

A.3. Methodology

Statutory Biodiversity Metric Baseline Inputs Methodology

Overview of Baseline Inputs

A.3.1. Watercourses (rivers, streams, canals and ditches) are assessed separately from area habitats in the metric. They generate "watercourse units" and require a distinct set of inputs.

A.3.2. In a watercourse BNG assessment, the baseline is the existing condition and extent of the watercourse before any development or intervention takes place. This is the reference point against which losses and gains are measured.

A.3.3. To establish the baseline, the following characteristics (pre-development) of each watercourse are identified and entered into the metric:

1) Watercourse Type and Distinctiveness;
1) Length;
2) Condition;
3) Strategic Significance;
4) Extent of Watercourse Encroachment; and
5) Extent of Riparian Encroachment.

A.3.4. Alongside watercourses, culverts are also recorded in the watercourse baseline.

A.3.5. Further information about these inputs is detailed below.

Watercourse Type and Distinctiveness

A.3.6. Watercourse type is assigned to each watercourse using the definitions provided below (Ref 30) in **Table A.1**. After entering the watercourse type, the distinctiveness category is automatically generated within the metric.

Table A.1 Watercourse Type and Distinctiveness Categories

Watercourse Type	Distinctiveness	Biodiversity Metric Watercourse Definition
Priority Habitat	Very High	Highly naturally functioning stretches which are on the Priority River Habitat Map[3] or meet the criteria for inclusion[4].
Other Rivers and Streams	High	These are rivers and streams that are not classified as Priority River Habitat. Resources used to find rivers and streams include the Statutory Main River Map[5], local data on ordinary watercourses[6], internal drainage data[7], and the Multi-Agency

[3] This map is used to locate priority river habitats, which are rivers and streams that exhibit a high degree of naturalness. Natural England (2025) Priority River Habitat – Rivers. Available from: Priority River Habitat - Rivers - data.gov.uk. [Accessed 24 March 2026].

[4] Further resources for river naturalness assessment can be found from the Freshwater Biological Association (FBA). Freshwater Biological Association (2026). Discovering Priority Habitats in England. Available from: Freshwater Naturalness Assessments – Discovering Priority Habitats in England. [Accessed 24 March 2026].

[5] The Environment Agency's Statutory Main River map shows which rivers in England are designated as 'main rivers'. Environment Agency (2026). Statutory Main River Map. Available from: Statutory Main River Map. [Accessed 24 March 2026].

[6] These are resources from the local council. Gov UK (2026). Find your local council. Available from: Find your local council - GOV.UK. [Accessed 24 March 2026].

[7] These are maps of internal drainage districts (IDDs) across England. Environment Agency (2025). Association of Drainage Authorities: Administrative Boundaries - Internal Drainage Districts in England. Available from: Association of Drainage Authorities: Administrative Boundaries - Internal Drainage Districts in England - data.gov.uk. [Accessed 24 March 2026].

Watercourse Type	Distinctiveness	Biodiversity Metric Watercourse Definition
		Geographic information for the Countryside (MAGIC)[8] map.
Canals	Medium	These are artificial bodies of water created for the purposes of navigation, whether it is currently navigable or not. These can be found from the Canal and River network[9], MAGIC[11] or historic local data.
Ditch	Medium	These are artificially created linear water-conveyancing features, further definition of which can be found below in **Section A.3.7**.
Culvert	Low	A covered channel or pipe designed to prevent the obstruction of a watercourse or drainage path by an artificial construction, as defined by the Flood and Water Management Act 2010 (Ref 39). A culvert can be recorded for sections of any watercourse type.

Ditch Definition

A.3.7. As reported in **Section A.2**, it can be difficult to distinguish between ditches and other rivers and streams, especially within an intensively managed agricultural landscape. However, the guide defines a ditch as 'an artificially created linear water-conveyancing feature,' which:

1) Is less than 5 m wide, and;

2) Is likely to retain water for more than 4 months of the year.

A.3.8. The additional criteria for distinguishing between ditches and other rivers and streams in the guide (Ref 30) are detailed in **Table A.2**.

Table A.2 Additional information to inform aquatic habitat classification

Criteria	Rivers and streams (including headwaters)	Ditches
Hydrology	A feature of broader hydrological systems, including flow paths, patterns, and connections with other rivers; water levels and flows in rivers are more dynamic	A feature of localised land drainage; water levels are often artificially managed, can be dry for large parts of year. Can include pumps for moving water.

[8] The Multi-Agency Geographic Information for the Countryside (MAGIC) website combines over 400 datasets about the rural, urban, coastal and marine environments of Great Britain into an interactive map. DEFRA (2026). Magic Map Application. Available at: MAGIC. [Accessed 24 March 2026].

[9] The Canal and River Trust provide an interactive map of canal and river networks. Canal and River Trust (2026). Our canal and river network. Available from: UK Canal Network Map | Canal & River Trust. [Accessed 24 March 2026].

	and less controlled, can be dry in headwaters.	
Landscape	Is in hydraulic continuity with a river system (flows into / out of a river system). Origin may be traced to natural source.	Artificial feature within natural landscape; any connections with natural rivers are the result of deliberate human intervention. Cannot be traced to a natural (spring) source.
Topography and gravity	Likely to follow natural landscape contours and influenced by gravity.	Does not drain along topographic flow paths; minimal gradient.
Historical	Evidence of historical features (historic bends or loops, paleo features); course aligns with pre-existing watercourses.	Long term linear; closely aligns with field boundaries; may not be present on historic maps.

Culverts

A.3.9. Culverts were identified using the Environment Agency's LiDAR Composite 1 m Digital Surface Model (DSM) (Ref 40). Where uncertainty existed regarding the presence of a culvert, breaks in watercourses classified as 'other rivers and streams' were assumed to indicate a likely culvert. This assumption was not applied to breaks in watercourses classified as ditches.

Length

A.3.10. The length of each watercourse is the centre line measurement of the channel, plus any additional length where sections of the riparian zone intersect with the Substation Works Site Boundary. This is where Substation Works Site Boundary crosses within 5 m of the bank top of ditches and within 10 m of the bank top of priority habitat, other rivers and streams, and canals. The length is measured in kilometres (km).

Condition

A.3.11. For priority habitat, other river and streams, and canals, the condition is determined using River Condition Assessment (RCA) methodology (see Section **A.3.18** onwards). For ditches, the condition is determined using Ditch Condition Assessment (DCA) methodology (see **Section A.3.32** onwards), and for culverts, the condition is automatically generated as Poor within the metric.

Strategic Significance

A.3.12. Strategic significance is the local significance of the habitat based on its location and habitat type. The categories for strategic significance are:

1) High (formally identified in local strategy);
2) Medium (location ecologically desirable but not in local strategy); and
3) Low (area / compensation not in local strategy).

A.3.13. The guide (Ref 30) states that where a Local Nature Recovery Strategy (LNRS) for an area has been published, the baseline strategic significance values for habitat parcels in that area should always be scored as low. The Greater Lincolnshire Local Nature Recovery Strategy (LNRS) is currently in consultation due to be adopted in June 2026 (Ref 24). In lieu of the finalised LNRS, the strategic significance of the watercourses has been determined through alignment with the draft LNRS[10].

Watercourse Encroachment

A.3.14. Watercourse encroachment can be any feature or action that adversely affects the natural function of the watercourse, or results in localised changes in habitat, species and migratory pathways (Ref 30).

A.3.15. The descriptions in **Table A.3** are used to assign watercourse encroachment. These descriptions apply to all watercourse types.

Table A.3 Watercourse encroachment bands

Watercourse encroachment band	Description
No encroachment	Less than 5% of the bank length is an engineered bank revetment and there is no encroachment into the channel.
Minor	5% to 20% of the bank length is an engineered bank revetment; or there is encroachment across up to 10% of the channel width at any one point.
Major	Greater than 20% of the bank length is an engineered bank revetment; or there is encroachment across greater than 10% of the channel width at any one point.
N/A - Culvert	To be used for culverts only.

Riparian Encroachment

A.3.16. Riparian zone encroachment is any feature or intervention (within the riparian zone) that reduces the quantity, quality or ecological function of the riparian habitat (Ref 30) This includes:

4) Buildings or hardstanding;

5) Management practices (including agriculture); and

6) Structures that present wildlife from accessing the riverbank.

A.3.17. The descriptions in **Table A.4** are used to assign riparian encroachment.

[10] Lincolnshire County Council (2026) Greater Lincolnshire Nature Recovery Strategy Consultation. Local Nature Recovery Strategy consultation | Let's Talk Lincolnshire [Accessed 24/03/2026]

Table A.4 The categories of riparian encroachment for rivers, canals and ditches

Riparian zone encroachment band for a bank	Definition for rivers and canals	Definition for ditches
No encroachment	No encroachment within 10 metres of bank top.	No encroachment within 5 metres of bank top.
Minor	Any encroachment 8 to 10 metres from the bank top (covering up to 100% of area); or where the footprint of encroachment occupies 0-10% of the riparian zone area 4 to 10 metres from bank top.	Any encroachment 4 to 5 metres from the bank top (covering up to 100% of area); or where the footprint of encroachment occupies 0-10% of the riparian zone area 2 to 5 metres from bank top.
Moderate	Where the footprint of encroachment occupies between 10% to 25% of the riparian zone area 4 to 10 metres from the bank top.	Where the footprint of encroachment occupies between 10% to 25% of the riparian zone area 2 to 5 metres from the bank top.
Major	Any encroachment 0 to 4 metres from the bank top; or where encroachment occupies greater than 25% of the total riparian zone area 4 to 10 metres from the bank top.	Any encroachment 0 to 2 metres from the bank top; or where the encroachment occupies greater than 25% of the total riparian zone area 2 to 5 metres from the bank top.

River Condition Assessment (RCA) Methodology

Overview

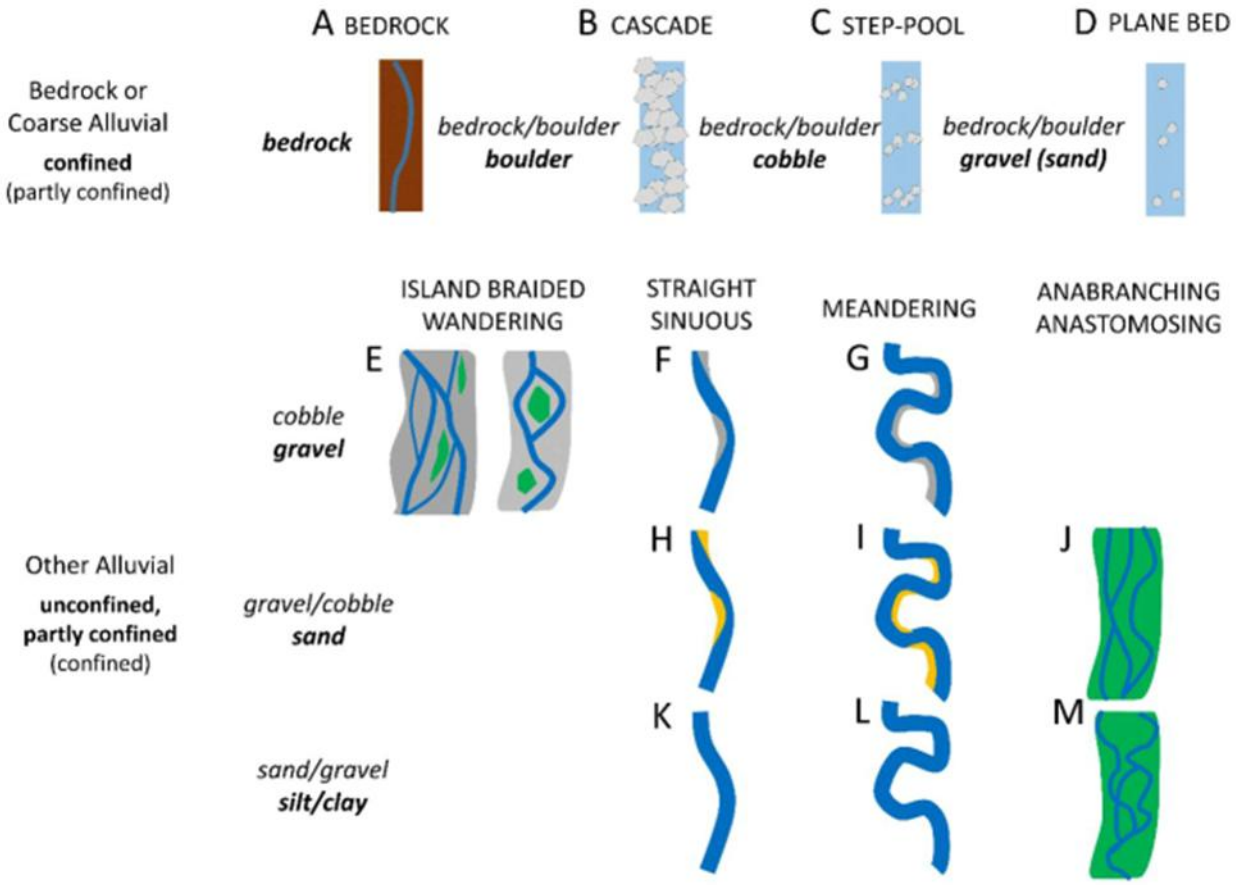
A.3.18. The RCA comprises both the ‘River Type’ desk study and MoRPh field survey elements to determine the condition of a river. Both parts must be undertaken and combined to allow a condition score to be generated and entered into the metric.

A.3.19. The River Type desk study is undertaken within the Cartographer online system (Ref 28) and is combined with the MoRPh surveys once they have been uploaded to the same system. Once both elements are completed, Cartographer will generate a condition score. Further information on the River Condition Assessment can be found within ‘A Guide to Assessing River Condition’ (Ref 29).

River Type Desk Study

A.3.20. The River Type desk study is undertaken at the reach scale to determine the morphological Type of a river. There are 15 Types in total, comprising engineered canals and navigable rivers, large rivers (>30 m wide), and the 13 near-natural river planform and bed material Types (Types A to M as shown in **Image A.1**).

Image A.1 The thirteen near-natural River Types A to M



A.3.21. Where a river is not considered to be a canal, navigable river or a large river, inputs into Cartographer are required to allow the system to calculate the River Type. These inputs include the reach river[11] and valley[12] length (to calculate sinuosity), the braiding and anabranching index (calculated using the reach length and number of bars or islands separating channels threads), the level of valley confinement, upstream and downstream elevations (to calculate gradient), and bed material from the MoRPh survey.

A.3.22. The River Type indicators and their sources are detailed in **Table A.5**.

Table A.5 River Type indicators and their sources

River Type indicator	Source
Braiding index	Desk study: The braiding index assesses whether a river reach typically shows a single flowing thread of water or more than one thread within a wider dynamic active channel. The index is the average number of distinct flowing threads counted across 10 equally spaced cross sections of the river corridor. This is calculated using aerial imagery, such as Google Earth.

[11] River length through desk study reach.

[12] Valley length through desk study reach.

River Type indicator	Source
Sinuosity index	Desk study: The sinuosity index is assessed for river reaches that typically show a single thread. The index is the ratio of the river reach length along the centre line of the main river channel divided by the length of the broad river or valley coarse. This is calculated using aerial imagery and elevation data within Google Earth.
Anabranching index	Desk study: The anabranching index assesses, for multi-thread reaches, how many threads are typically separated by heavily vegetated areas into distinct channels. The index is the average number of distinct flowing channels separated by islands, counted across 10 equally spaced cross sections of the anabranching river system. This is calculated using aerial imagery, such as Google Earth.
Level of confinement	Desk study: The level of confinement is estimated from the approximate proportion of the river reach's bank length that is in close proximity to the valley sides or ancient terraces. Confined reaches have more than 90% of the bank length in close proximity to the valley sides; partly confined reaches have between 10% and 90% of the bank length in close proximity to the valley sides; and unconfined reaches have less than 10% of the bank length in close proximity to the valley sides. This is calculated using contoured mapping or aerial imagery with elevation data such as Google Earth.
Valley gradient	Desk study: Valley gradient is the difference in elevation between the start and end of the river reach divided by the length of the broad valley course. This is calculated using contoured mapping or aerial imagery with elevation data such as Google Earth.
Bedrock reaches	MoRPh survey: Bedrock reaches are recorded where bedrock is observed as extensive (>33% cover) in at least three modules or is extensive in 2 modules and present (5% to 33% cover) in the remaining three modules of the MoRPh5 subreach.
Coarsest bed material size class	MoRPh survey: The coarsest bed material size class observed as present (5% to 33% cover) or extensive (>33% cover) in any module within the MoRPh5 subreach. The options are clay, silt, sand, gravel, cobble, boulder, and bedrock.
Average alluvial bed material size class	MoRPh survey: This is a weighted average of the alluvial bed material size classes (i.e. excluding bedrock) recorded as present (55 to 33% cover) or extensive (>33% cover) in all five modules within a MoRPh5 subreach.

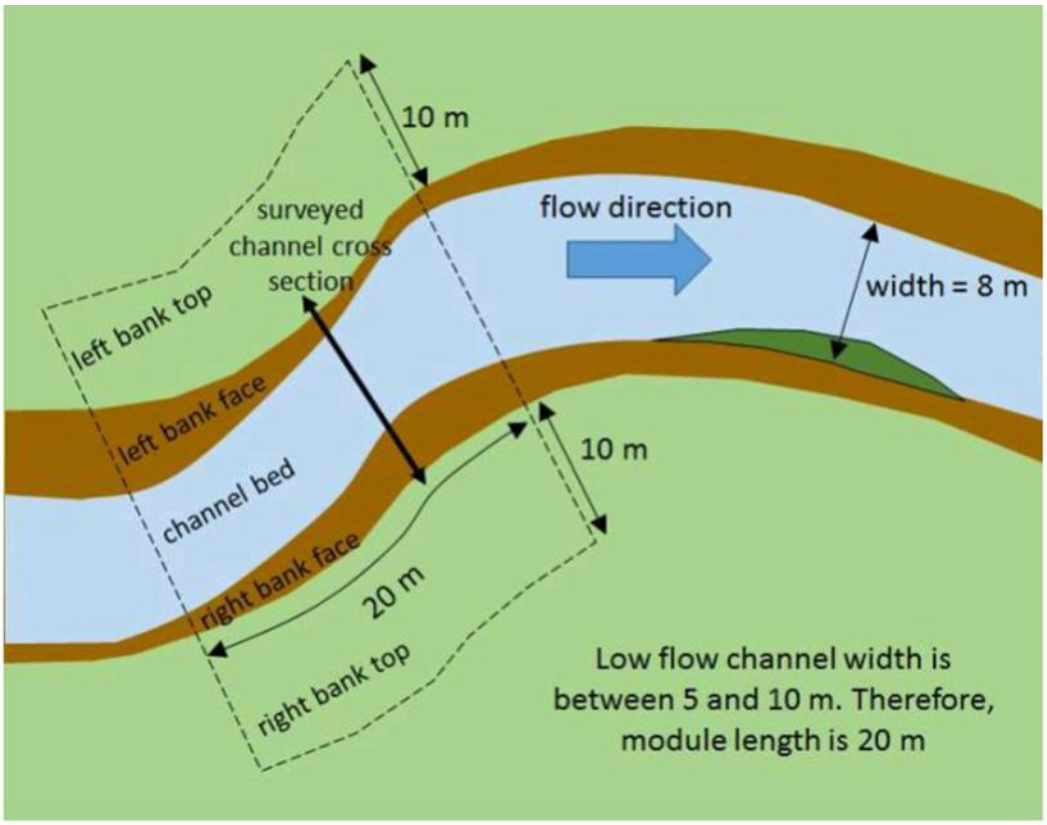
MoRPh Survey

A.3.23. The MoRPh survey is used to collect field information at the 'subreach' scale. To conduct a MoRPh survey, a river is split into modules. A 'MoRPh5' subreach comprises five contiguous modules along the river, with each module requiring a MoRPh survey. The length of each module along the river is determined by the average MoRPh river width (module length is approximately double the MoRPh width), which is the low flow water width plus the width of areas of regularly inundated bare sediment or marginal/emergent plants. Each module also extends 10 m back from the bank tops to include the riparian zone. **Image A.2** shows the layout of a MoRPh survey and MoRPh5 subreach. **Table A.6** details the MoRPh river widths and corresponding module and MoRPh5 subreach lengths.

Table A.6 MoRPh river widths and corresponding module and MoRPh5 subreach lengths

MoRPh river width	River length for each module	River length for each MoRPh5 survey
<5 m	10 m	50 m
5 m to <10 m	20 m	100 m
10 m to <20 m	30 m	150 m
20 m to <30 m	40 m	200 m
≥30 m or where the bed is not visible	50 m	250 m

Image A.2 Example layout of a MoRPh survey (dashed box shows survey module)



A.3.24. The MoRPh survey is split into five main parts:

1) General information such as width, depth and location;
2) The bank tops section covers the top of the bank to 10 m back and includes both sides of the river;
3) The bank face section covers both banks;
4) The channel margin section covers the bank face and water margin on both sides; and
5) The channel bed section covers the central parts of the channel, including any islands or other mid channel features.

A.3.25. Each MoRPh survey records a variety of features for each of the latter four parts of the survey. The majority of features are either recorded with a number (e.g. if there is one outfall the number recorded will be one), or by one of the following four options:

6) Absent – this feature was not recorded;
7) Trace – the feature was recorded as covering an area (of the relevant part of the survey) of less than 5%;
8) Present – the feature was recorded as covering an area (of the relevant part of the survey) of 5% to 33%; and
9) Extensive – the feature was recorded as covering an area (of the relevant part of the survey) of more than 33%.

A.3.26. Some features, such as channel shading or dominant tree type, require an option selection.

A.3.27. Each MoRPh survey (for each module) is surveyed using the mobile based Cartographer app (Ref 28) which allows the survey to be uploaded to the Cartographer online system instantly. Once all surveys within a subreach have been completed and uploaded, and a River Type desk study has been completed for the reach, the two can be linked and a condition score can be generated. In addition to the condition score, river condition indicator scores are also generated and can be viewed or downloaded to provide further details on the condition score of the subreach. The 32 condition indicators and part of the survey they belong to are detailed in **Table A.7**.

Table A.7 River condition indicators (those in *italics* are negative indicators)

Survey section	Indicator name
Bank top	B1: Bank Top Vegetation Structure
	B2: Bank Top Tree Feature Richness
	B3: Bank Top Water-Related Features
	B4: Bank Top NNIPS Cover
	B5: Bank Top Managed Ground Cover
Bank face	C1: Bank Face Riparian Vegetation Structure

Survey section	Indicator name
	C2: Bank Face Tree Feature Richness
	C3: Bank Face Natural Bank Profile Extent
	C4: Bank Face Natural Bank Profile Richness
	C5: Bank Face Natural Bank Material Richness
	C6: Bank Face Bare Sediment Extent
	C7: Bank Face Artificial Bank Profile Extent
	C8: Bank Face Reinforcement Extent
	C9: Bank Face Reinforcement Material Severity
	C10: Bank Face NNIPS Cover
Channel – water margin	D1: Channel Margin Aquatic Vegetation Extent
	D2: Channel Margin Aquatic Morphotype Richness
	D3: Channel Margin Physical Feature Extent
	D4: Channel Margin Physical Feature Richness
	D5: Channel Margin Artificial Features
Channel bed	E1: Channel Aquatic Morphotype Richness
	E2: Channel Bed Tree Features Richness
	E3: Channel Bed Hydraulic Features Richness
	E4: Channel Bed Natural Features Extent
	E5: Channel Bed Natural Features Richness
	E6: Channel Bed Material Richness
	E7: Channel Bed Siltation
	E8: Channel Bed Reinforcement Extent
	E9: Channel Bed Reinforcement Severity
	E10: Channel Bed Artificial Features Severity
	E11: Channel Bed NNIPS Extent
	E12: Channel Bed Filamentous Algae Extent

Note: Non-Native Invasive Plant Species (NNIPS)

River Condition Score

A.3.28. Following completion of the River Type desk study for the reach and the MoRPh surveys, a condition score can be generated. Both a numerical condition score and a condition class are generated. The final condition classes are:

1) Good;
2) Fairly good;
3) Moderate;
4) Fairly poor; and
5) Poor.

A.3.29. The numerical condition score generated during the RCA will determine which condition class the subreach falls within. The condition class is also determined based on the River Type. **Table A.8** details the river types and thresholds for each class.

Table A.8 Condition class thresholds for each River Type

River Type	Canals and Navigable Rivers	Large Rivers	A	B	C	D	E	F	G	H	I	J	K	L	M
Best score	1.8	2.2	2.4	2.7	2.7	2.7	2.7	2.8	3.0	2.9	3.1	2.8	2.4	2.4	2.4
Lower threshold for GOOD	1.4	1.8	1.9	2.2	2.2	2.2	2.2	2.3	2.5	2.4	2.5	2.3	1.9	1.9	1.9
Lower threshold for FAIRLY GOOD	0.9	1.3	1.2	1.4	1.4	1.4	1.4	1.5	1.6	1.6	1.7	1.5	1.2	1.2	1.2
Lower threshold for MODERATE	0.3	0.5	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.5	0.6	0.4	0.2	0.2	0.2
Lower threshold for FAIRLY POOR	-0.5	-0.4	-1.0	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.8	-0.9	-1.0	-1.0	-1.0
Worst score (POOR)	-1.5	-1.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5

Over-deep Rivers

A.3.30. Over-deep channels are those that are to some extent hydrologically and thus ecologically disconnected from their riparian margins and floodplains. Over-deep channels may support a diverse range of physical habitats but if these are hydrologically disconnected it reduces their potential to support biodiversity.

A.3.31. The recognition of an over-deep channel is undertaken by a geomorphologist based on field inspection and the results of MoRPh surveys. Where a channel is judged to be over-deep, the condition class of that river is reduced by one class (e.g. if the river is in Moderate condition but over-deep, the condition should be lowered to Fairly Poor).

Ditch Condition Assessment (DCA) Methodology

Survey Overview

A.3.32. To evaluate the ecological condition of a ditch, a biodiversity metric condition sheet (Ref 22) is used to identify the presence of the following features:

1) Water quality: The ditch is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution;
2) Vegetation: A range of emergent, submerged and floating-leaved plants are present. As a guide >10 species of emergent, floating or submerged plants present in a 20 m ditch length;
3) Eutrophication: There is less than 10% cover of filamentous algae and duckweed Lemna spp. (these are signs of eutrophication);
4) Structure: A fringe of aquatic marginal vegetation is present along more than 75% of the ditch;
5) Damage/Management: Physical damage is evident along less than 5% of the ditch, with examples of damage including: excessive poaching, damage from machinery use or storage, or any other damaging management activities;
6) Water Level: Sufficient water levels are maintained - as a guide a minimum summer depth of approximately 50 cm in minor ditches and 1 m in main drains;
7) Shading: Less than 10% of the ditch is heavily shaded; and
8) Biosecurity: There is an absence of non-native plant and animal species[13].

A.3.33. An example of the DCA survey proforma is provided in **Annex A**.

A.3.34. The condition classes for ditches are:

1) Good (passes 8 criteria);
2) Moderate (passes 6 or 7 criteria); and
3) Poor (passes 5 or fewer criteria).

[13] This includes any species listed on the Water Framework Directive UKTAG GB High Impact Species List: Water Framework Directive (WFD) UKTAG (2021) Classification of aquatic alien species according to their level of impact. Available at UKTAG classification of alien species working paper v8.pdf (wfduk.org). [Accessed 20 March 2026].

A.4. Baseline Results

River Condition Assessment (RCA) Results

Survey Overview

A.4.1. A River Condition Assessment was undertaken on three watercourses.

Watercourse: WC_WM_69 (Lord's Drain / Moulton River)

A.4.2. Lord's Drain is a Water Framework Directive (WFD) waterbody (Waterbody ID: GB205031050755) in the Anglian River Basin District Management Plan[14]. Lord's Drain is a relatively small watercourse which had a water width of 4 m and water depth of 0.5 m at the time of survey. The watercourse originates from an upstream agricultural drainage network and discharges into the River Welland downstream. Historically managed, the watercourse features a uniform channel that has been artificially reprofiled and straightened to support the agricultural practices in the surrounding landscape. The bed is composed of silt, and the uniformity of the channel has resulted in a consistent flow regime. The riparian zones are characterised by arable fields, with an area of broadleaved woodland on the right bank top downstream.

A.4.3. MoRPh surveys were undertaken by accredited surveyors on 9th February 2026 in dry conditions when the watercourse was not in spate.

A.4.4. One subreach (Subreach 1) was surveyed to capture condition information on the length that would likely be impacted by the Scheme (Crossing ID: RJ-WCX-19). This subreach was located between NGR TF 29258 26727 and TF 29323 26718. Since the average MoRPh river width was <5 m, the module length was 10 m and, therefore, the length of the subreach was 50 m.

A.4.5. Representative photographs of the subreach are provided.

[14] WFD Waterbody ID: GB205031050755. Further information is available at: Moulton River | Catchment Data Explorer | Catchment Data Explorer. [Accessed 1st April 2026].

Image A.3 View upstream along Module 1, located at NGR TF 29258 26727.



Image A.4 View downstream along Module 5, located at NGR TF 29323 26718.



River Type Desk Study Results

A.4.6. In accordance with RCA guidance (Ref 29), the reach used to determine the river type was identified by locating upstream or downstream points where significant changes in planform occur, or where major tributaries or flow barriers are present.

A.4.7. The results of the River Type desk study for WC_WM_69 (Lord's Drain) are presented below in **Table A.9** and **Table A.10**.

Table A.9 River Type desk study indicators

River Type indicator	WC_WM_69 (Lord's Drain)
Braiding index	The reach has a braiding index of 1 since there is only one single thread of flowing water.
Sinuosity index	The sinuosity index of the reach is 1.045. The watercourse has some sinuosity; however, it has been artificially straightened in places.
Anabranching index	Similar to the braiding index, the reach has an anabranching index of 1 since there is only one single thread of flowing water.
Level of confinement	The reach was determined to be unconfined since both banks are not in contact with valley sides.
Valley gradient	Reach valley gradient is 0.00037 m/m, with upstream elevation being 5.6 m and downstream elevation being 2.3 m. The reach valley length is 8.9 km.
Bedrock reaches	No bedrock was recorded throughout the surveyed subreaches.
Coarsest bed material size class	The coarsest bed material recorded in the surveys was silt.
Average alluvial bed material size class	The average bed material recorded in the surveys was silt.

Table A.10 River type desk study results

	Upstream extent of reach	Downstream extent of reach	River Type for the reach
WC_WM_69 (Lord's Drain)	TF 26790 24034 This is where Lord's Drain is culverted beneath Fulney and likely connects to the Coronation Channel.	TF 29584 30728 This is where Lord's Drain discharges into the River Welland.	Type K – straight sinuous, with the coarsest bed material being sand and average bed material being silt.

MoRPh Survey Results

A.4.8. Five modules were surveyed for the subreach using the MoRPh methodology. As previously mentioned, the locations of the MoRPh surveys were chosen to allow for monitoring where the length would most likely be impacted by the Scheme.

A.4.9. The 32 river condition indicators were extracted from the MoRPh5 field surveys and are presented in **Table A.11**. An explanation of the results is provided in **Section A.6**.

Table A.11 River condition indicator scores (those in *italics* are negative indicators) for each subreach of WC_WM_69 (Lord's Drain)

	WC_WM_69 (Lord's Drain)
River condition indicator	**Subreach 1**
B1: Bank Top Vegetation Structure	1
B2: Bank Top Tree Feature Richness	0
B3: Bank Top Water-Related Features	0
B4: Bank Top NNIPS Cover	0
B5: Bank Top Managed Ground Cover	-3
C1: Bank Face Riparian Vegetation Structure	1
C2: Bank Face Tree Feature Richness	0
C3: Bank Face Natural Bank Profile Extent	0
C4: Bank Face Natural Bank Profile Richness	0
C5: Bank Face Natural Bank Material Richness	1
C6: Bank Face Bare Sediment Extent	4
C7: Artificial Bank Profile Extent	-4
C8: Bank Face Reinforcement Extent	0
C9: Bank Face Reinforcement Material Severity	0
C10: Bank Face NNIPS Cover	0
D1: Channel Margin Aquatic Vegetation Extent	2
D2: Channel Margin Aquatic Morphotype Richness	1
D3: Channel Margin Physical Feature Extent	0
D4: Channel Margin Physical Feature Richness	0

	WC_WM_69 (Lord's Drain)
River condition indicator	**Subreach 1**
D5: Channel Margin Artificial Features	0
E1: Channel Aquatic Morphotype Richness	0
E2: Channel Bed Tree Features Richness	0
E3: Channel Bed Hydraulic Features Richness	1
E4: Channel Bed Natural Features Extent	0
E5: Channel Bed Natural Features Richness	0
E5: Channel Bed Natural Features Richness	0
E6: Channel Bed Material Richness	3
E7: Channel Bed Siltation	-4
E8: Channel Bed Reinforcement Extent	0
E9: Channel Bed Reinforcement Severity	0
E10: Channel Bed Artificial Features Severity	0
E11: Channel bed NNIPS Extent	0
E12: Channel Bed Filamentous Algae Extent	0

Note: Non-Native Invasive Plant Species (NNIPS)

River Condition Scores

A.4.10. Once the River Type was generated for the subreach, and linked to the MoRPh5 results within Cartographer, a condition score was generated.

A.4.11. Subreach 1 has a condition score of -0.109 which falls within the **Fairly Poor** condition class. For River Type K, the lower threshold for Fairly Poor condition is -1.0 and the threshold for Moderate condition is 0.2. Therefore, Subreach 1 lies towards the lower end of the Fairly Poor range. It is noted, however, that the River Shape had a score of 1.143, which is considered likely to be overdeep. The final condition is therefore lowered by one class, which would result in Subreach 1 having a condition of **Poor**.

A.4.12. Overall, the condition of WC_WM_69 (Lord's Drain) is **Poor**.

Watercourse: WC_WM_63

A.4.13. WC_WM_63 is a small and unnamed watercourse which had a water width of 1 m and water depth of 30 cm at the time of survey. The watercourse is part of an agricultural drainage network and shows some sinuosity in flow, but it has been historically managed through artificial straightening and reprofiling to support the agricultural practices in the surrounding landscape. The watercourse features a uniform channel profile, a consistent flow regime, and the bed is composed of silt. The channel is dominated by terrestrial vegetation, suggesting the watercourse likely

dries out in the summer, although there are some macrophytes present. The riparian zones are characterised by arable fields.

A.4.14. MoRPh surveys were undertaken by accredited surveyors on 11 March 2026 in dry conditions when the watercourse was not in spate.

A.4.15. Three subreaches were surveyed to capture condition information on lengths that would likely be most impacted by the Scheme. The furthest upstream subreach, Subreach 1 (Crossing ID: WC-WCX-3), was located between NGR TF 29463 28439 and TF 29462 28500. Subreach 2 was located between NGR TF 29477 28782 and TF 29478 28840 and Subreach 3 was located between NGR TF 29561 29035 and TF 29600 29069. Since the average MoRPh river width was <5 m for each subreach, the module length was 10 m and, therefore, the total length of each subreach was 50 m.

A.4.16. Representative photographs of the three subreaches are provided.

Image A.5 View across Module 1 of Subreach 1, located at NGR TF 29463 28439.



Image A.6 View downstream along Module 5 of Subreach 2, located at NGR TF 29478 28840.



Image A.7 View upstream along Module 5 of Subreach 3, located at NGR TF 29600 29069.



River Type Desk Study Results

A.4.17. In accordance with RCA guidance (Ref 29), the reach used to determine the river type was identified by locating upstream or downstream points where significant changes in planform occur, or where major tributaries or flow barriers are present.

A.4.18. The results of the River Type desk study for WC_WM_63 are provided below in **Table A.12** and **Table A.13**.

Table A.12 River Type desk study indicators

River Type indicator	WC_WM_63
Braiding index	The reach has a braiding index of 1 since there is only one single thread of flowing water.
Sinuosity index	The sinuosity index of the reach is 1.009. The watercourse has some sinuosity; however, it has been artificially straightened in places.
Anabranching index	Similar to the braiding index, the reach has an anabranching index of 1 since there is only one single thread of flowing water.
Level of confinement	The reach was determined to be unconfined since both banks are not in contact with valley sides.
Valley gradient	Reach valley gradient is 0.00072 m/m, with upstream elevation being 5.9 m and downstream elevation being 3.6 m. The reach valley length is 8.9 km.
Bedrock reaches	No bedrock was recorded throughout the surveyed subreaches.
Coarsest bed material size class	The coarsest bed material recorded in the surveys was silt.
Average alluvial bed material size class	The average bed material recorded in the surveys was silt.

Table A.13 River Type desk study results

	Upstream extent of reach	Downstream extent of reach	River Type for the reach
WC_WM_63	TF 28448 28056 This is where the watercourse connects to another agricultural drain.	TF 30183 29914 This is where the watercourse likely discharges into Lord's Drain.	Type K – straight sinuous, with the coarsest bed material being sand and average bed material being silt.

MoRPh Survey Results

A.4.19. Five modules were surveyed for each subreach using the MoRPh methodology. As previously mentioned, the locations of the MoRPh surveys were chosen to allow for monitoring where lengths would most likely be impacted by the Scheme.

A.4.20. The 32 river condition indicators were extracted from the MoRPh5 field surveys and are presented in **Table A.14**. An explanation of the results is provided in **Section A.6**.

Table A.14 River condition indicator scores (those in *italics* are negative indicators) for each subreach of WC_WM_63

	WC_WM_63		
River condition indicator	**Subreach 1**	**Subreach 2**	**Subreach 3**
B1: Bank Top Vegetation Structure	1	1	1
B2: Bank Top Tree Feature Richness	0	0	0
B3: Bank Top Water-Related Features	0	0	0
B4: Bank Top NNIPS Cover	0	0	0
B5: Bank Top Managed Ground Cover	-3.	-3	-3
C1: Bank Face Riparian Vegetation Structure	1	1	1
C2: Bank Face Tree Feature Richness	0	0	0
C3: Bank Face Natural Bank Profile Extent	0	0	0
C4: Bank Face Natural Bank Profile Richness	0	0	0
C5: Bank Face Natural Bank Material Richness	1	1	1
C6: Bank Face Bare Sediment Extent	2	1	1
C7: Artificial Bank Profile Extent	-4	-4	-4
C8: Bank Face Reinforcement Extent	0	0	0
C9: Bank Face Reinforcement Material Severity	0	0	0
C10: Bank Face NNIPS Cover	0	0	0
D1: Channel Margin Aquatic Vegetation Extent	1	1	2
D2: Channel Margin Aquatic Morphotype Richness	0	1	2
D3: Channel Margin Physical Feature Extent	0	0	0
D4: Channel Margin Physical Feature Richness	0	0	0
D5: Channel Margin Artificial Features	0	0	0
E1: Channel Aquatic Morphotype Richness	2	2	2

	WC_WM_63		
River condition indicator	**Subreach 1**	**Subreach 2**	**Subreach 3**
E2: Channel Bed Tree Features Richness	0	0	0
E3: Channel Bed Hydraulic Features Richness	0	0	1
E4: Channel Bed Natural Features Extent	0	0	0
E5: Channel Bed Natural Features Richness	0	0	0
E6: Channel Bed Material Richness	2	2	2
E7: Channel Bed Siltation	0	0	0
E8: Channel Bed Reinforcement Extent	0	0	0
E9: Channel Bed Reinforcement Severity	0	0	0
E10: Channel Bed Artificial Features Severity	0	0	0
E11: Channel bed NNIPS Extent	0	0	0
E12: Channel Bed Filamentous Algae Extent	-4	-4	-3

Note: Non-Native Invasive Plant Species (NNIPS)

River Condition Scores

A.4.21. Once the River Types were generated for the subreaches, and linked to the MoRPh5 results within Cartographer, a condition score was generated for each subreach.

A.4.22. Subreach 1 has a condition score of -0.085 which falls within the **Fairly Poor** condition class. For River Type K, the lower threshold for Fairly Poor condition is -1.0 and the threshold for Moderate condition is 0.2. Therefore, Subreach 1 lies towards the lower end of the Fairly Poor range. It is noted, however, that the River Shape had a score of 0.371, which is considered likely to be overdeep. The final condition is therefore lowered by one class, which would result in Subreach 1 having a condition of **Poor**.

A.4.23. Subreach 2 has a condition score of -0.320, which falls within the **Fairly Poor** condition class. For River Type K, Subreach 2 lies towards the lower end of the Fairly Poor range. However, similarly to Subreach 1, the River Shape had a score of 0.357, which is considered likely to be overdeep. The final condition is therefore lowered by one class, which would result in Subreach 2 having a condition of **Poor**.

A.4.24. Subreach 3 has a condition score of -0.085, which falls within the **Fairly Poor** condition class. For River Type K, Subreach 3 lies towards the lower end of the Fairly Poor range. However, similarly to the other subreaches, the River Shape had a score of 0.371, which is considered likely to be overdeep. The final condition is therefore lowered by one class, which would result in Subreach 3 having a condition of **Poor**.

A.4.25. Overall, the condition of WC_WM_63 is **Poor**.

WC_WM_46

A.4.26. WC_WM_46 is a small watercourse which had a water width of 1.2 m and water depth of between 20-30 cm in the wetted areas of the channel at the time of survey. The watercourse is part of an agricultural drainage network and connects to WC_WM_63 upstream. The watercourse shows sinuosity in flow but has been artificially managed with reprofiled banks to support the agricultural practices in the surrounding landscape. The watercourse features a uniform channel profile, and the bed is composed of silt. The watercourse was not flowing at the time of survey and became dry upstream where the watercourse may have historically connected to the River Welland before the earth embankments on the bank top of the River Welland were built. The riparian zones are characterised by arable fields, with some broadleaved woodland. There are stands of reeds in the channel.

A.4.27. MoRPh surveys were undertaken by accredited surveyors on 11 March 2026 in dry conditions when the watercourse was not in spate.

A.4.28. One subreach (Subreach 1) was surveyed to capture condition information on the length that would likely be most impacted by the Scheme. The subreach was located between NGR TF 29567 29524 and TF 29512 29535. Since the average MoRPh river width was <5 m for the subreach, the module length was 10 m and, therefore, the total length of the subreach was 50 m.

A.4.29. Representative photographs of the subreach are provided.

Image A.8 View upstream of Module 3, located at NGR TF 29540 29531.



Image A.9 View downstream of Module 5, located at TF 29512 29535.



River Type Desk Study Results

A.4.30. In accordance with RCA guidance (Ref 29), the reach used to determine the river type was identified by locating upstream or downstream points where significant changes in planform occur, or where major tributaries or flow barriers are present.

A.4.31. The results of the River Type desk study are provided in **Table A.15** and **Table A.16**.

Table A.15 River Type desk study indicators

River Type indicator	WC_WM_46
Braiding index	The reach has a braiding index of 1 since there is only one single thread of flowing water.
Sinuosity index	The sinuosity index of the reach is 1.037. The watercourse has some sinuosity; however, it has been artificially straightened in places.
Anabranching index	Similar to the braiding index, the reach has an anabranching index of 1 since there is only one single thread of flowing water.
Level of confinement	The reach was determined to be unconfined since both banks are not in contact with valley sides.

River Type indicator	WC_WM_46
Valley gradient	Reach valley gradient is 0.00093 m/m, with upstream elevation being 6.4 m and downstream elevation being 5 m. The reach valley length is 1.508 km.
Bedrock reaches	No bedrock was recorded throughout the surveyed subreaches.
Coarsest bed material size class	The coarsest bed material recorded in the surveys was silt.
Average alluvial bed material size class	The average bed material recorded in the surveys was silt.

Table A.16 River Type desk study results

	Upstream extent of reach	Downstream extent of reach	River Type for the reach
WC_WM_46	TF 29747 29372 This is the confluence where the watercourse meets WC_WM_63.	TF 28679 30033 This is where the watercourse may have historically discharged into the River Welland.	Type K – straight sinuous, with the coarsest bed material being sand and average bed material being silt.

MoRPh Survey Results

A.4.32. Five modules were surveyed in the subreach using the MoRPh methodology. As previously mentioned, the locations of the MoRPh surveys were chosen to allow for monitoring where the length would most likely be impacted by the Scheme.

A.4.33. The 32 river condition indicators were extracted from the MoRPh5 field surveys and are presented in **Table A.17**. An explanation of the results is provided in **Section A.6**.

Table A.17 River condition indicator scores (those in *italics* are negative indicators) and explanation for the subreach of WC_WM_46

	WC_WM_46
River condition indicator	**Subreach 1**
B1: Bank Top Vegetation Structure	1
B2: Bank Top Tree Feature Richness	0
B3: Bank Top Water-Related Features	0
B4: Bank Top NNIPS Cover	0
B5: Bank Top Managed Ground Cover	-3

	WC_WM_46
River condition indicator	**Subreach 1**
C1: Bank Face Riparian Vegetation Structure	2
C2: Bank Face Tree Feature Richness	1
C3: Bank Face Natural Bank Profile Extent	0
C4: Bank Face Natural Bank Profile Richness	0
C5: Bank Face Natural Bank Material Richness	1
C6: Bank Face Bare Sediment Extent	1
C7: Artificial Bank Profile Extent	-4
C8: Bank Face Reinforcement Extent	0
C9: Bank Face Reinforcement Material Severity	0
C10: Bank Face NNIPS Cover	0
D1: Channel Margin Aquatic Vegetation Extent	2
D2: Channel Margin Aquatic Morphotype Richness	1
D3: Channel Margin Physical Feature Extent	0
D4: Channel Margin Physical Feature Richness	0
D5: Channel Margin Artificial Features	0
E1: Channel Aquatic Morphotype Richness	2
E2: Channel Bed Tree Features Richness	0
E3: Channel Bed Hydraulic Features Richness	0
E4: Channel Bed Natural Features Extent	0
E5: Channel Bed Natural Features Richness	0
E6: Channel Bed Material Richness	3
E7: Channel Bed Siltation	0
E8: Channel Bed Reinforcement Extent	0
E9: Channel Bed Reinforcement Severity	0
E10: Channel Bed Artificial Features Severity	0
E11: Channel bed NNIPS Extent	0
E12: Channel Bed Filamentous Algae Extent	-4

Note: Non-Native Invasive Plant Species (NNIPS)

River Condition Scores

A.4.34. Once the River Type was generated for the subreach, and linked to the MoRPh5 results within Cartographer, a condition score was generated.

A.4.35. The subreach has a condition score of -0.109 which falls within the **Fairly Poor** condition class. For River Type K, the lower threshold for Fairly Poor condition is -1.0 and the threshold for Moderate condition is 0.2. Therefore, Subreach 1 lies towards the lower end of the Fairly Poor range. It is noted, however, that the River Shape had a score of 0.432, which is considered likely to be overdeep. This is likely due to historic modifications. The final condition is therefore lowered by one class, which would result in an overall condition of **Poor.**

A.4.36. Overall, the condition of WC_WM_46 is **Poor.**

Ditch Condition Assessment Results

Survey Overview

A.4.37. The following ditches were surveyed on-site in March 2026 during dry weather conditions, were determined to hold water for more than 4 months of the year, and were therefore included in the BNG calculations:

1) WC_WM_134;
2) WC_WM_142; and
3) WC_WM_159.

A.4.38. The following ditches had a DCA completed remotely, using aerial imagery and survey data and photographs from various ecology disciplines. These ditches were determined to hold water for more than 4 months of the year, and were therefore included in the BNG calculations:

1) WC_WM_74;
2) WC_WM_115 (Crossing ID: WM-WCX-20); and
3) WC_WM_129.

A.4.39. The following ditches were not visited for a ditch condition assessment (DCA), and there are no survey data or photographs from other ecology disciplines to complete a DCA remotely. As a precaution, it has been assumed that these ditches hold water for more than four months of the year and condition of these ditches has been assumed as **Moderate**:

1) WC_WM_56;
2) WC_WM_60;
3) WC_WM_51; and
4) WC_WM_212 (Crossing ID: WM-WCX-20a).

A.4.40. The condition of the ditches surveyed on-site and remotely are presented below in **Table A.18**.

A.4.41. Representative photographs of each ditch that has been surveyed are provided.

Table A.18 Ditch Condition Assessment results

Feature	WC_WM_134	WC_WM_142	WC_WM_159	WC_WM_74	WC_WM_115	WC_WM_129
Upstream NGR	TF 28891 26015	TF 29201 25746	TF 29347 25470	TF 29018 28122	TF 28801 26354	TF 29163 25797
Downstream NGR	TF 29012 25906	TF 29022 25898	TF 29308 25511	TF 28813 28718	TF 29217 26334	TF 29236 26326
Crossing ID number (if applicable)	N/A	N/A	N/A	N/A	WM-WCX-20	N/A
Water quality	✓	✓	✗	✓	✓	✓
Vegetation	✗	✗	✗	✗	✗	✗
Eutrophication	✗	✗	✗	✓	✓	✓
Structure	✓	✓	✓	✓	✓	✓
Damage/Management	✓	✓	✓	✓	✓	✓
Water level	✗	✗	✗	✗	✗	✗
Shading	✓	✓	✓	✓	✓	✓
Biosecurity	✓	✓	✓	✓	✓	✓
Number of passes	**5**	**5**	**4**	**6**	**6**	**6**
Overall condition scores	**Poor**	**Poor**	**Poor**	**Moderate**	**Moderate**	**Moderate**

Image A.10 Channel view of WC_WM_134, taken in March 2026.



Image A.11 View along WC_WM_142, taken in March 2026.



Image A.12 View along WC_WM_159, taken in March 2026.



Image A.13 View along WC_WM_74, taken in February 2025.



Image A.14 View along WC_WM_115, taken in February 2025.



Image A.15 View along WC_WM_129, taken in February 2025.



Dry Ditches

A.4.42. Six ditches were excluded from the metric as they have been surveyed by various ecology disciplines and retain water for less than 4 months of the year. The name, location, and justification for exclusion of each ditch are shown in **Table A.19**.

A.4.43. Representative photographs of each excluded ditch are provided.

Table A.19 Dry ditches excluded from the aquatic BNG assessment

Watercourse ID	Crossing ID number (if applicable)	Upstream NGR	Downstream NGR	Justification for exclusion
WC_WM_61	WM-WCX-1a	TF 29071 29211	TF 29481 29007	Ditch was dry in April 2024 and May 2025 when it was surveyed by various ecology disciplines. There are some reeds present in the channel; however the ditch is dominated by terrestrial vegetation.
WC_WM_65	N/A	TF 28799 28732	TF 28336 29123	Ditch was dry when it was surveyed in September 2024 by an ecology discipline. There are some reeds present in the channel; however the ditch is dominated by terrestrial vegetation.
WC_WM_95 and WC_WM_85	N/A	TF 29518 28020	TF 29554 27555	These ditches were dry when they were surveyed in June 2024, February 2025 and August 2025 by various ecology disciplines. No macrophytes are present. The channel is dominated by terrestrial vegetation.
WC_WM_103	WM-WCX-18	TF 29207 27071	TF 29498 27034	Ditch was dry when it was surveyed in March 2025, May 2025 and August 2025 by various ecology disciplines. No macrophytes are present. The channel is dominated by terrestrial vegetation, including scrub and trees.

WC_WM_149	N/A	TF 29275 25622	TF 29209 25735	Ditch was mostly dry in March 2026 with only small pools of water present from recent rainfall. No macrophytes are present. The channel is dominated by terrestrial vegetation, including scrub and trees.

Image A.16 View upstream of WC_WM_61, taken in April 2024



Image A.17 View along WC_WM_65, taken in September 2024



Image A.18 View downstream of WC_WM_95 and WC_WM_85, taken in February 2025



Image A.19 View along WC_WM_103, taken in August 2025



Image A.20 View along WC_WM_149, taken in March 2026.



Statutory Biodiversity Metric Baseline Input Results

Overview

A.4.44. The information presented in **Table A.20** was used to populate the baseline in the metric.

A.4.45. No encroachment was recorded within the channel of any watercourse.

A.4.46. Major riparian encroachment was recorded along most bank tops of the watercourses, as a result of surrounding arable agricultural land-use.

Table A.20 Baseline inputs into the Metric

Watercourse ID	Watercourse type	Baseline length (km)	Condition	Strategic significance	Extent of watercourse encroachment	Extent of riparian encroachment for both banks	Total watercourse units	Length retained (km)	Units retained
WC_WM_115	Ditches	0.03368	Moderate	Low	No Encroachment	Major/Major	0.20	0.02068	0.12
WC_WM_63	Other rivers and streams	1.57309	Poor	Low	No Encroachment	Major/Major	7.08	0.38424	1.73
WC_WM_56	Ditches	0.32063	Moderate	Low	No Encroachment	Major/Major	1.92	0.32063	1.92
WC_WM_60	Ditches	0.32055	Moderate	Low	No Encroachment	Major/Major	1.92	0.32055	1.92
WC_WM_74	Ditches	0.17228	Moderate	Low	No Encroachment	Major/Major	1.03	0.17228	1.03
WC_WM_51	Ditches	0.36504	Moderate	Low	No Encroachment	Major/Major	2.19	0.36504	2.19
WC_WM_134	Ditches	0.14686	Poor	Low	No Encroachment	Major/Major	0.44	0	0.00
WC_WM_69 (Lord's Drain)	Other rivers and streams	0.04168	Poor	Low	No Encroachment	Major/Major	0.19	0.04168	0.19
WC_WM_129	Ditches	0.34868	Moderate	Low	No Encroachment	Major/Major	2.09	0.34868	2.09
WC_WM_142	Ditches	0.23747	Poor	Low	No Encroachment	Major/Major	0.71	0	0.00
WC_WM_159	Ditches	0.03407	Poor	Low	No Encroachment	No Encroachment/ No Encroachment	0.14	0	0.00

Watercourse ID	Watercourse type	Baseline length (km)	Condition	Strategic significance	Extent of watercourse encroachment	Extent of riparian encroachment for both banks	Total watercourse units	Length retained (km)	Units retained
N/A - Culvert	Culvert	0.00639	Poor	Low	N/A - Culvert	N/A - Culvert	0.01	0.00639	0.01
WC_WM_212	Ditches	0.02425	Moderate	Low	No Encroachment	Major/Major	0.15	0.01625	0.10
N/A - Culvert	Culvert	0.00483	Poor	Low	N/A - Culvert	N/A - Culvert	0.01	0.00483	0.01
WC_WM_46	Other rivers and streams	0.71694	Poor	Low	No Encroachment	Major/Major	3.23	0.71694	3.23
N/A - Culvert	Culvert	0.008	Poor	Low	N/A - Culvert	N/A - Culvert	0.01	0.008	0.00

A.5. Post-development Impacts Results

The Construction Elements

Introduction

A.5.1. The following construction elements were identified that may have an effect on the structure, function or condition of watercourses within the Substation Works Site Boundary. This includes elements that may affect the channel of the watercourses directly, or elements that are within 5 m of the bank top (the riparian zone) for ditches and within 10 m of the bank top (the riparian zone) for other rivers and streams.

A.5.2. These elements are permanent features, and will remain post-construction:

1) Substation permanent drainage diversion;
2) Substation outfall pipes;
3) Substation sustainable drainage systems (SuDS) basins;
4) Environmental mitigation; and
5) Highway interventions.

A.5.3. These elements are temporary features, and will be removed after the construction period, which is 2.5 years:

1) Sustainable drainage systems (SuDS) basins for construction;
2) Outfall pipes for construction;
3) Bridge working areas; and
4) Construction access swathe.

A.5.4. Within the metric, none of the construction elements can be assessed as temporary impacts because the construction period for the Substation Works is 3.5 years, and therefore the baseline habitat type and condition of any impacted watercourses will not be restored within two years of initial impact (Ref 30).

A.5.5. This section provides an assessment of the anticipated post-development impacts associated with these elements, with consideration given to how the Substation Works will influence geomorphology and the riparian habitats of the affected watercourses.

Substation permanent drainage diversion

A.5.6. WC_WM_63 is being diverted around the boundary of the new substation. The section of the existing channel being lost measures 744.85 m, while the new diverted channel will be 814.64 m in length. The new diversion will primarily function for land drainage purposes and as such, has specific profile structure requirements and would be subject to regular dredging and other management practices which limit the opportunities for further enhancements and contributions to BNG.

A.5.7. The diversion is assumed to be of **Poor** condition, retaining the same dimensions as WC_WM_63, and the banks will be seeded with an amenity grassland mix.

A.5.8. Within the metric, the removal of the existing channel has been recorded as habitat loss, while the newly diverted channel has been recorded as created habitat.

Substation outfall pipes

A.5.9. The effected watercourses are:

1) WC_WM_63 – one substation outfall; and
2) WC_WM_75 – one substation outfall.

A.5.10. The substation outfall pipes are being constructed to discharge treated water from the substation sustainable drainage systems (SuDS) basins.

A.5.11. In the absence of detailed design information for the Substation Works outfalls, a precautionary, worst-case scenario has been adopted for the assessment of post-development impacts. This assumes the installation of a buried pipe with a 5 × 5 m concrete headwall located on the bank face. It is further assumed that the outfalls will be recessed into the bank and will not extend into the channel.

A.5.12. For the affected watercourses, there is already major encroachment along both bank tops due to arable agriculture. As such, any construction activities required to construct the outfalls, such as vegetation clearance, are not expected to increase the existing level of encroachment.

A.5.13. For WC_WM_75 the footprint of a 5 × 5 m headwall would represent less than 5% of the total bank length of the watercourse. In accordance with the metric, impacts are not considered below this threshold, and the habitat may therefore be classified as retained.

A.5.14. In addition, for WC_WM_63, the footprint of a 5 x 5 m headwall for the substation outfall pipe, in conjunction with the five construction outfalls that are also proposed along this watercourse (there are six outfalls in total), would represent less than 5% of the total bank length. The habitat has therefore been classified as retained.

Substation sustainable drainage systems (SuDS) basins

A.5.15. In relation to the new watercourse diversion of WC_WM_63, a SuDS basin is proposed on the left bank top. While not designed to permanently hold water, this feature will be periodically inundated and will be seeded with a water tolerant wildflower grassland mix, which has the potential to improve the condition of the watercourse by reducing existing encroachment from arable agriculture.

A.5.16. However, given the early stage of design, and as no measures are currently planned to enhance the condition of the watercourse directly, a precautionary approach has been adopted, and it is assumed that the construction of the SuDS basin will not result in a measurable change in condition. On this basis, the habitat is classified as retained.

Environmental mitigation

A.5.17. A belt of woodland planting is proposed along approximately 444 m of the left bank top (383 m) and right bank top (61 m) of WC_WM_63 for substation screening purposes. At present, this watercourse has major encroachment on both bank tops from arable agriculture. While the woodland planting has the potential to improve the condition of the watercourse by reducing existing encroachment, the Scheme is still

at an early design stage, and no additional measures are currently planned to enhance the condition of the watercourse directly.

A.5.18. Consequently, a precautionary approach has been adopted, and it is assumed that the woodland planting will reduce riparian encroachment, but this will not result in a measurable change in condition. Therefore, this length of watercourse has been classified as enhanced within the metric.

A.5.19. Additionally, the woodland planting has been entered into the metric with a four-year delay to reflect a worst-case scenario in which planting does not take place until the end of the construction period. Although the construction period is 3.5 years, the metric does not allow for a 3.5-year delay in the commencement of habitat enhancement.

Highway interventions

A.5.20. The effected watercourses are:

1) WC_WM_134;
2) WC_WM_142; and
3) WC_WM_159.

A.5.21. Highway interventions include road widening to create passing places for construction vehicles using hardstanding. For WC_WM_134 and WC_WM_142, these ditches will be completely removed to facilitate these works and subsequently re-created elsewhere. The ditches are currently of **Poor** condition, and the newly created ditches are also assumed to be of **Poor** condition, and, at this stage of design, are assumed to be of equivalent length to those lost.

A.5.22. Within the metric, the removal of the existing ditches has been recorded as habitat loss, while the proposed replacement ditches have been recorded as created habitat.

A.5.23. For WC_WM_159, there is currently no encroachment along the bank tops. However, the proposed road widening will increase encroachment on the right bank top to a major level for the entire bank length. This change in encroachment has been reflected within the metric assessment.

Sustainable drainage systems (SuDS) basins for construction

A.5.24. The effected watercourses are:

1) WC_WM_63 – one SuDS basin;
2) WC_WM_115 – one SuDS basin; and
3) WC_WM_129 – one SuDS basin.

A.5.25. During the construction period, SuDS basins are proposed on the bank tops of these watercourses. Similarly to the substation SuDS, while not designed to permanently hold water, these features will be periodically inundated and will be seeded with a water tolerant wildflower grassland mix, which has the potential to improve the condition of WC_WM_63 (watercourse type: other rivers and streams) by reducing existing encroachment from arable agriculture.

A.5.26. However, given the early stage of design, and as no measures are currently planned to enhance the condition of WC_WM_63 directly, a precautionary approach has been

adopted, and it is assumed that the construction of the SuDS basins will not result in a measurable change in condition.

A.5.27. Furthermore, for WC_WM_115 and WC_WM_129 (watercourse type: ditches), a reduction in riparian encroachment will also not result in a measurable change in condition.

A.5.28. On this basis, these habitats have been classified as retained.

Outfall pipes for construction

A.5.29. The effected watercourses are:

1) WC_WM_63 – five outfalls;
2) WC_WM_115 – one outfall; and
3) WC_WM_129 – three outfalls.

A.5.30. The outfall pipes are being constructed to discharge treated water from the sustainable drainage systems (SuDS) basins during construction.

A.5.31. Similarly to the substation outfalls, in the absence of detailed design information, a precautionary, worst-case scenario has been adopted for the assessment of post-development impacts. This assumes the installation of a buried pipe with a 5 × 5 m concrete headwall located on the bank face. It is further assumed that the outfalls will be recessed into the bank and will not extend into the channel.

A.5.32. For the effected watercourses, there is already major encroachment along both bank tops due to arable agriculture. As such, any construction activities required to construct the outfalls, such as vegetation clearance, are not expected to increase the existing level of encroachment.

A.5.33. For WC_WM_63, the footprint of the 5 x 5 m headwalls for these outfall pipes, in conjunction with the footprint of the substation outfall pipe (there are six outfalls in total), would represent less than 5% of the total bank length. The habitat has therefore been classified as retained.

A.5.34. Similarly, for WC_WM_129, the footprint of these outfall pipes would represent less than 5% of the total bank length, therefore the habitat has also been classified as retained.

A.5.35. However, for WC_WM_115, the footprint of this outfall would represent approximately 7% of the total bank length within the Substation Works Site Boundary. The guide defines minor encroachment as between 5% to 20% of the bank length (Ref 30), therefore the level of watercourse encroachment will increase from none to minor encroachment during the construction period. This change has been reflected in the metric.

Bridge working areas

A.5.36. A working area to construct a clear span bridge is proposed over WC_WM_69 (Lord's Drain).

A.5.37. The construction of the bridge will require the removal of terrestrial habitat from the bank tops to enable the installation of temporary foundations supporting the bridge structure. Currently, at this stage of design, there is no further information about how

the channel itself will be managed throughout these works. Therefore, it has been assumed that the watercourse itself will be unaffected.

A.5.38. WC_WM_69 (Lord's Drain) currently has major encroachment on both bank tops due to arable agriculture. As such, the installation of the temporary foundations is not expected to increase the existing level of encroachment. Furthermore, no impacts are anticipated within the channel. On this basis, the watercourse habitat is classified as retained.

Construction access swathe

A.5.39. The effected watercourses are:

1) WC_WM_63 – one culvert;
2) WC_WM_115 – one culvert; and
3) WC_WM_212 – one culvert.

A.5.40. Culverts will be constructed on these watercourses to facilitate haul roads for construction access. The culverts will be 8 m in length, with 6.5 m of vegetation clearance on the bank tops for temp draining and temporary topsoil and subsoil storage.

A.5.41. For the effected watercourses, there is already major encroachment along both bank tops due to arable agriculture. As such, any construction activities required to create the culverts, such as vegetation clearance, are not expected to increase the existing level of encroachment.

A.5.42. Within the metric, the section of watercourses that are being culverted has been recorded as 8 m of habitat loss that will be re-created after the construction period.

Summary

A.5.43. A summary table of the construction impacts for each watercourse is provided in **Table A.21**.

Watercourse Retention and Loss

Overview

A.5.44. In the metric, retained habitats are watercourses that remain in place after development and are not subject to any measurable change in condition or extent from the Substation Works (Ref 29).

A.5.45. This includes where there are no interventions on the watercourse itself or the riparian zones.

A.5.46. In comparison, lost habitats are sections of watercourses that are permanently removed or no longer function as watercourse habitat as a result of the proposed development. For the Substation Works, this includes if the channel is removed entirely e.g. replaced with hardstanding.

A.5.47. Additionally, watercourse habitats that are temporarily lost for 3.5 years during the construction period will also be shown as a loss. For the Substation Works, this includes the construction of the temporary outfalls and culverts. This is because,

within the metric, construction impacts lasting more than two years are treated as permanent losses.

A.5.48. **Table A.22** details how retained and lost habitats for the Substation Works have been inputted into the metric.

Watercourse Creation

Overview

A.5.49. In the metric, created habitats are new sections of watercourses which have been created as part of the Substation Works (Ref 30).

A.5.50. However, watercourse creation also includes interventions which do not promote natural functions and processes, or the development of natural watercourse habitats.

A.5.51. For the Substation Works, this includes if:

1) A new watercourse is constructed;
2) A watercourse is diverted;
3) Culverts are installed; and
4) There is a change in the level of riparian encroachment which does not promote natural functions and processes.

A.5.52. Additionally, watercourse habitats which are subject to temporary losses during the construction period of 3.5 years have been created with a delay to account for the construction period.

A.5.53. **Table A.23** details how created habitats for the Substation Works have been inputted into the metric.

Watercourse Enhancement

Overview

A.5.54. In the metric, watercourse enhancement is where project interventions promote natural function, processes, and the development of natural habitats (Ref 30).

A.5.55. For the Substation Works, this includes changes in the level of riparian encroachment which may improve watercourse condition e.g. woodland planting on the bank tops.

A.5.56. **Table A.24** details how watercourse enhancement for the Substation Works has been inputted into the metric.

Table A.21 Summary table of construction impacts for each watercourse affected

Construction Elements	Watercourse ID								
	WC_WM_63	WC_WM_74	WC_WM_134	WC_WM_142	WC_WM_159	WC_WM_115	WC_WM_129	WC_WM_69 (Lord's Drain)	WC_WM_212
Substation permanent drainage diversion	Diversion around substation boundary								
Substation outfall pipes	One outfall on new diversion	One outfall							
Substation sustainable drainage systems (SuDS) basins	One SuDS basin on new diversion								
Environmental mitigation	Woodland planting for substation screening								
Highway interventions			Ditch lost from road widening	Ditch lost from road widening	Increase in riparian encroachment				
Sustainable drainage systems (SuDS) basins for construction	One SuDS basin					One SuDS basin	One SuDS basin		
Outfall pipes for construction	Five outfalls, two are on the new diversion					One outfall	Three outfalls		
Bridge working areas								One working area	
Construction access swathe	One culvert on the new diversion					One culvert			One culvert

Table A.22 Watercourse retention and loss

Watercourse ID	Watercourse Type	Baseline length (km)	Length retained (km)	Length lost (km)	Units retained	Units lost	Explanation
WC_WM_115	Ditches	0.03368	0.02068	0.01	0.12	0.08	Length retained is the baseline length minus 8 m for the construction access culvert and 5 m for the construction outfall pipe (13 m in total).
WC_WM_63	Other rivers and streams	1.57309	0.38424	0.74	1.73	3.35	Length retained is the baseline length minus the length of watercourse lost to create the diversion (744.85 m) and the length enhanced from woodland planting (444 m).
WC_WM_56	Ditches	0.32063	0.32063	0.00	1.92	0.00	The whole length is retained.
WC_WM_60	Ditches	0.32055	0.32055	0.00	1.92	0.00	The whole length is retained.
WC_WM_74	Ditches	0.17228	0.17228	0.00	1.03	0.00	The whole length is retained.
WC_WM_51	Ditches	0.36504	0.36504	0.00	2.19	0.00	The whole length is retained.
WC_WM_134	Ditches	0.14686	0	0.15	0.00	0.44	The whole length is being lost from road widening and re-created elsewhere.

Watercourse ID	Watercourse Type	Baseline length (km)	Length retained (km)	Length lost (km)	Units retained	Units lost	Explanation
WC_WM_69 (Lord's Drain)	Other rivers and streams	0.04168	0.04168	0.00	0.19	0.00	The whole length is retained.
WC_WM_129	Ditches	0.34868	0.34868	0.00	2.09	0.00	The whole length is retained.
WC_WM_142	Ditches	0.23747	0	0.24	0.00	0.71	The whole length is being lost from road widening and re-created elsewhere.
WC_WM_159	Ditches	0.03407	0	0.03	0.00	0.14	The whole length will have an increase in riparian encroachment from road widening.
N/A - Culvert	Culvert	0.00639	0.00639	0.00	0.01	0.00	The culvert is retained.
WC_WM_212	Ditches	0.02425	0.01625	0.01	0.10	0.05	Length retained is the baseline length minus 8 m for the construction access culvert (8 m in total).
N/A - Culvert	Culvert	0.00483	0.00483	0.00	0.01	0.00	The culvert is retained.
WC_WM_46	Other rivers and streams	0.71694	0.71694	0.00	3.23	0.00	The whole length is retained.
N/A - Culvert	Culvert	0.008	0.00	0.01	0.00	0.01	The culvert is not retained as it is a section of WC_WM_63 which is being lost for the watercourse diversion.

Table A.23 Watercourse creation

Watercourse ID	Watercourse Type	Length (km)	Condition	Strategic Significance	Habitat created in advance (years)	Delay in starting habitat creation (years)	Extent of watercourse encroachment	Extent of riparian encroachment for both banks	Watercourse units delivered
WC_WM_134	Ditches	0.14686	Poor	Low	0	0	No Encroachment	Major/Major	0.28
WC_WM_142	Ditches	0.23747	Poor	Low	0	0	No Encroachment	Major/Major	0.46
WC_WM_159	Ditches	0.03407	Poor	Low	0	0	No Encroachment	Major/No Encroachment	0.08
WC_WM_63	Other rivers and streams	0.80664	Poor	Low	0	0	No Encroachment	Major/Major	1.16
WC_WM_63	Other rivers and streams	0.008	Poor	Low	0	4	No Encroachment	Major/Major	0.01
WC_WM_115	Ditches	0.013	Moderate	Low	0	4	No Encroachment	Major/Major	0.04
WC_WM_212	Ditches	0.008	Moderate	Low	0	4	No Encroachment	Major/Major	0.02

Table A.24 Watercourse enhancement

Watercourse ID	Watercourse Type	Length (km)	Condition	Strategic Significance	Habitat enhanced in advance (years)	Delay in starting habitat enhancement (years)	Extent of watercourse encroachment	Extent of riparian encroachment for both banks	Watercourse units delivered
WC_WM_63	Other rivers and streams	0.444	Poor	Low	0	4	No Encroachment	Major/No Encroachment	2.32

Overall Results

A.5.57. Within the Substation Works Site Boundary, 19 watercourses were identified for assessment. Three of these watercourses were classified as rivers or streams, while sixteen were classified as ditches. Three culverts were identified using the Environment Agency's LiDAR Composite 1 m Digital Surface Model (DSM) (Ref 40).

A.5.58. Following the collection of survey data, six ditches were excluded from the assessment as they are dry for more than four months of the year. This left 13 watercourses (three rivers or streams, ten ditches) and three culverts that were entered into the baseline and assessed for post-development impacts from the Substation Works.

A.5.59. The calculation completed within the Statutory Biodiversity Metric established that the watercourse baseline represents 21.32 watercourse units (comprising 4.35 km) in total.

A.5.60. The post-intervention calculation established that implementation of the Substation Works would result in a total 18.92 watercourse units. Overall, this represents a net loss of -2.40 watercourse units (-11.27% net loss). The required 10% BNG would therefore not be met on-site for watercourse units.

A.6. MoRPh Condition Indicator Scores

A.6.1. Condition Indicator Scores are set out within A Guide to Assessing River Condition (Ref 29).

A.6.2. A value is calculated for each River condition indicator from the MoRPh5 survey data using a formula. The indicator value is then translated into a condition indicator score of 0 to +4 for positive indicators or 0 to -4 for negative indicators. Each condition indicator is listed below, the formula used to calculate its value is described, and a table illustrates how the indicator values are translated into condition indicator scores (0 to +4 or 0 to -4).

Group B: Bank Top Indicators

B1 Bank top vegetation structure

A.6.3. This indicator is a count of the presence (Present (P) or Extensive (E) only) of 5 vegetation structural types that are recorded on the bank tops (mosses / lichens, short / creeping herbs / grasses, tall herbs / grasses, scrub / shrubs, saplings / trees) of the 5 surveyed modules. The count is applied to each bank separately and then the values for the two banks are added together.

A.6.4. The count is applied to each bank separately and then the values for the two banks are added together.

Table A.25 B1 Bank top condition indicator values and scores

Indicator value	0	1 to 4	5 to 7	8	9 to 10

Indicator score	0	1	2	3	4

B2 Bank top tree feature richness

A.6.5. This indicator is a count of the presence (P or E only) of 5 tree features that are recorded on bank tops (fallen trees, leaning trees, j-shaped trees, tree/shrub branches trailing into the river channel, large wood) of the 5 surveyed modules. The count is applied to each bank separately and then the values for the two banks are added together.

Table A.26 B2 Bank top tree feature richness condition indicator values and scores

Indicator value	0	1	2 to 3	4 to 6	7 to 10
Indicator score	0	1	2	3	4

B3 Bank top water-related features

A.6.6. This indicator applies the following look-up table to each bank and then adds the scores.

Table A.27 Bank top water-related feature indicator look-up table summary

Water-related feature	T	P	E
Pond: disconnected	2	19	67
Pond: connected	2	19	67
Side channel	2	19	67
Wetland: Short non-woody vegetation (e.g. mosses, sedges)	2	19	67
Wetland: Tall, non-woody vegetation (e.g. reeds, rushes)	2	19	67
Wetland: Shrubs and trees (e.g. alder / willow carr)	2	19	67

Table A.28 B3 Bank top water-related feature condition indicator values and scores

Indicator value	0	<20	20 to <135	135 to <335	>335
Indicator score	0	1	2	3	4

B4 Bank top NNIPS cover

A.6.7. This indicator combines the number and extent of 6 non-native invasive plant species (NNIPS) on each bank by applying the following look-up table. The results for the two banks are added for each module and then summed over the 5 modules.

Table A.29 Bank top NNIPS cover indicator look-up table summary

Species	T	P	E
Himalayan balsam	-2	-19	-67
Japanese knotweed	-2	-19	-67
Giant hogweed	-2	-19	-67
Floating pennywort	-2	-19	-67
Other species 1	-2	-19	-67
Other species 2	-2	-19	-67

Table A.30 B4 Bank top NNIPS cover condition indicator values and scores

Indicator value	0	<0 to -19	<19 to -67	<67 to -268	<-268
Indicator score	0	-1	-2	-3	-4

B5 Bank top managed ground cover

A.6.8. This indicator assesses the potential severity (likely pressure on the river ecosystem) and extent of the dominant and sub-dominant artificial / managed ground cover types observed on each bank. The weightings for each ground cover type in the following table are multiplied by -2, -19, -67, respectively according to their abundance T, P, E on each bank top, then summed across both bank tops and accumulated across the 5 modules in the subreach.

Table A.31 Bank top managed ground cover weighting summary

	Artificial managed ground cover A	Weighting
Tr	Transport infrastructure (road, railway, car park)	5
Ic	Buildings (commercial / industrial)0	5
Re	Buildings (residential)	5
Ld	Landfill area	4
Sy	Storage area	3
Fp	Pedestrianised, footpath	2
Ar	Arable agriculture / allotments	2
Pv	Permanently vegetated agriculture (e.g. pasture, orchard)	1
Pr	Permanently vegetated recreation (e.g. playing fields, parks, gardens)	1
Pw	Plantation woodland	1
Ow	Open water (e.g. canal, reservoir)	0

Table A.32 B5 Bank top managed ground cover condition indicator values and scores

Indicator value	0	< 0 to -95	<-95 to -670	<-670 to -1340	<-1340
Indicator score	0	-1	-2	-3	-4

Group C: Bank Face Indicators

C1 Bank face riparian vegetation structure

A.6.9. This indicator is a count of the presence (P or E only) of 5 vegetation structural types that are recorded on the bank faces (mosses / lichens, short / creeping herbs / grasses, tall herbs / grasses, scrub / shrubs, saplings / trees) of the five surveyed modules. The count is applied to each bank separately and then the values for the two banks are added together.

Table A.33 C1 Bank face riparian vegetation condition indicator values and scores

Indicator value	0	1 to 4	5 to 7	8 to 9	10
Indicator score	0	1	2	3	4

C2 Bank face tree feature richness

A.6.10. This indicator is a count of the presence (P or E only) of 7 tree features that are recorded on bank faces (fallen trees, leaning trees, j-shaped trees, tree/shrub branches trailing into channel, large wood, exposed tree roots, discrete organic accumulations) of the five surveyed modules. The count is applied to each bank of the MoRP5 subreach separately and then the values for the two banks are added together.

Table A.34 C2 Bank face tree feature richness condition indicator values and scores

Indicator value	0	1 to 3	4 to 6	7 to 9	10 to 14
Indicator score	0	1	2	3	4

C3 Bank face natural bank profile extent

A.6.11. A maximum of 2 natural bank profile types are recorded on each bank. The indicator is the sum of the abundance of natural profiles recorded as P (=19) or E (=67) across both banks for each module and then these values are accumulated over the 5 modules.

Table A.35 C3 Bank face natural bank profile extent condition indicator values and scores

Indicator value	0	1 to <335	>335 to <670	>670 to <1340	1340
Indicator score	0	1	2	3	4

C4 Bank face natural bank profile richness

A.6.12. The indicator is a count of 7 different natural bank profile types (V, Vo, Vu, Vt, St, Gt, Cm) that are recorded as P or E along either bank of any module within the MoRPh5 subreach. A single count is applied across both banks (i.e. maximum possible value is 7).

Table A.36 C4 Bank face natural bank profile richness condition indicator values and scores

Indicator value	0	1	2	3	>4
Indicator score	0	1	2	3	4

C5 Bank face natural bank material richness

A.6.13. Count of 10 different natural bank material types (BE, BO, CO, GP, EA, SA, SI, CL, PE, OR) that are recorded as dominant in the upper or lower parts of any of the bank profiles within the subreach (i.e. each type can only be counted once).

Table A.37 C5 Bank face natural bank material richness condition indicator values and scores

Indicator value	0	1	2	3	>4
Indicator score	0	1	2	3	4

C6 Bank face bare (unvegetated) sediment extent

A.6.14. The indicator value is the total abundance of bare sediment on the bank face across both banks along the subreach (T, P and E are counted as 2, 19 and 67).

A.6.15. Condition indicator values and scores: (note non-linear scale because intermediate abundances of bare sediment provide the most varied habitat):

Table A.38 C6 Bank face bare sediment extent condition indicator values and scores

Indicator value	0	>0 to 70 or >600	>70 to 135 or >535 to 600	>135 to 205 or >465 to 535	>205 to 465
Indicator score	0	1	2	3	4

C7 Bank face artificial bank profile extent

A.6.16. A maximum of 2 artificial profile types from a possible set of 5 (Rs, Ts, Em, Sm, Pc) are recorded on each bank. This indicator is based on the total extent of all artificial profiles recorded across both banks (where T = -2, P = -19 or E = -67) within a single MoRPh module and then the values are summed across the 5 modules in the subreach.

Table A.39 C7 Bank face artificial bank profile condition indicator values and scores

Indicator value	0	<0 to -57	<-57 to -134	<-134 to -335	<-335
Indicator score	0	-1	-2	-3	-4

C8 Bank face reinforcement extent

A.6.17. The indicator represents the vertical (Top only(T) = 0.5, Bottom only(B) = 0.5, Whole(W) = 1) and horizontal (T = -2, P = -19, E = -67) extents of reinforcement multiplied together for each bank and then added across both banks and all 5 modules in the subreach.

Table A.40 C8 Bank face reinforcement condition indicator values and scores: (reaches m to t only)

Indicator value	0	<0 to -34	<-34 to -168	<-168 to -335	<-335
Indicator score	0	-1	-2	-3	-4

C9 Bank face reinforcement material severity

A.6.18. The indicator represents the sum of the severity level of the dominant reinforcement type observed on each bank. The values for the two banks in each module are added together and then accumulated for the 5 modules in the subreach.

Table A.41 Bank face reinforcement material severity scoring summary

	Dominant reinforcement type	Severity
CC	Concrete	-3
CB	Concrete & brick / laid stone (cemented)	-3
BR	Brick / laid stone (cemented)	-3
SP	Sheet piling	-3
WP	Wood piling	-2
RR	Rip-rap (large laid stone, uncemented)	-2
GA	Gabions	-2

BW	Builders Waste	-1
WO	Washed out	-1
WS	Willow spiling	0
RE	Planted reeds	0
BC	Biotex / coir	0

Table A.42 C9 Bank face reinforcement material severity condition indicator values and scores

Indicator value	0	-1 to -3	-4 to -12	-12 to -18	<-18
Indicator score	0	-1	-2	-3	-4

C10 Bank face NNIPS cover

A.6.19. This indicator combines the number and extent of up to 6 non-native invasive plant species (NNIPS) on each bank face by applying the following look-up table. The results for the two banks are added for each module and then summed over 5 modules.

Table A.43 C10 Bank face NNIPS cover scoring summary

Species	T	P	E
Himalayan balsam	-2	-19	-67
Japanese knotweed	-2	-19	-67
Giant hogweed	-2	-19	-67
Floating pennywort	-2	-19	-67
Other species 1	-2	-19	-67
Other species 2	-2	-19	-67

Table A.44 C10 Bank face NNIPs cover condition indicator values and scores

Indicator value	0	<0 to -19	<19 to -67	<67 to -268	<-268
Indicator score	0	-1	-2	-3	-4

Group D: Channel Margin – Water Edge Indicators

D1 Channel margin aquatic vegetation extent

A.6.20. This indicator is the accumulated lateral extent of 4 aquatic morphotypes (liverworts/mosses/lichens; emergent broad-leaved; emergent linear-leaved; amphibious), scored T=2, P=19, E=67 for their lateral extent along each channel margin. Values are calculated for each bank of a module, summed for both banks and then the values for all 5 modules are added together.

Table A.45 D1 channel margin aquatic vegetation extent condition indicator values and scores

Indicator value	0	>0 to 67	>67 to 335	>335 to 860	>860
Indicator score	0	1	2	3	4

D2 Channel margin aquatic morphotype richness

A.6.21. This indicator is a count of up to 4 aquatic morphotypes (liverworts/mosses/lichens; emergent broad-leaved; emergent linear-leaved; amphibious) that are recorded as P or E in any module across both channel margins within a subreach.

Table A.46 D2 Channel margin aquatic morphotype richness condition indicator values and scores

Indicator value	0	1	2	3	4
Indicator score	0	1	2	3	4

D3 Channel margin physical feature extent

A.6.22. This indicator records the total extent of 8 channel margin physical features recorded as P or E (unvegetated side bar, vegetated side bar, berm, bench, stable cliff, eroding cliff, toe, marginal backwater) and 1 that is recorded as a count (tributary junction). Abundances are scored 19, 67 for P or E, and 67 is assigned for a count of at least 1. The values are summed across both banks and across all 5 modules within a subreach.

Table A.47 D3 Channel margin physical feature extent condition indicator values and scores

Indicator value	0	>0 to 268	>268 to 536	>536 to 860	>860
Indicator score	0	1	2	3	4

D4 Channel margin physical feature richness

A.6.23. This indicator counts the number of 9 different channel margin physical features that are recorded as P or E (unvegetated side bar, vegetated side bar, berm, bench, stable cliff, eroding cliff, toe, marginal backwater) or have a count of at least 1 (tributary junction). Each feature can only be counted once within a subreach (i.e. maximum count is 9).

Table A.48 D4 Channel margin physical feature richness condition indicator values and scores

Indicator value	0	1 to 2	3 to 4	5 to 6	7 to 9
Indicator score	0	1	2	3	4

D5 Channel margin artificial features

A.6.24. This indicator scores pipes and outfalls, jetties and deflectors according to their number and weights jetties and deflectors according to their size (and thus relative potential impact) (see following table). For ‘other artificial features’ these should be assigned to either the jetty or deflector category according to your assessment of the relative severity of the feature, with an explanation recorded in the survey comments box regarding the type of feature and nature of the pressure observed. The values for each bank are summed and accumulated across the 5 modules of the subreach.

Table A.49 D5 Channel margin artificial features scoring summary

Feature	Minor	Intermediate	Major
Jetty	-2	-19	-67
Deflector (includes bridge pier at/on bank face)	-4	-34	-134
		Score for each	
Pipes / outfalls (if appear potentially functional): RECORD AS COUNT		-19	

Table A.50 D5 Channel margin artificial features condition indicator values and scores

Indicator value	0	<0 to -76	<-76 to -134	<-134 to -268	<-268
Indicator score	0	-1	-2	-3	-4

Group E: Channel Bed Indicators

E1 Channel aquatic morphotype richness

A.6.25. The indicator is a count of all aquatic plant morphotypes recorded on the channel bed as T, P or E apart from filamentous algae (i.e. 9 possible types).

Table A.51 E1 Channel aquatic morphotype richness condition indicator values and scores

Indicator value	0	1	2-3	4-6	>6
Indicator score	0	1	2	3	4

E2 Channel bed tree feature richness

A.6.26. The indicator is a count of 7 tree features on the channel bed that are recorded as P or E (vegetation shading channel, submerged tree roots, trees/shrubs/saplings growing from the submerged river bed, large wood, discrete accumulation of organic material) or have a count of >1 (large wood dam, fallen tree). Each feature can only be counted once (i.e. maximum score is 7).

Table A.52 E2 Channel bed tree feature richness condition indicator values and scores

Indicator value	0	1	2 to 3	4 to 5	6 to 7
Indicator score	0	1	2	3	4

E3 Channel bed hydraulic feature richness

A.6.27. The indicator is a count of 8 possible water surface flow types (free fall, chute, broken standing waves, unbroken standing waves, upwelling, rippled, smooth, no perceptible flow) observed as P or E. Each feature can only be counted once (i.e. maximum score is 8).

Table A.53 E3 Channel bed hydraulic feature richness condition indicator values and scores

Indicator value	1	2	3 to 4	5 to 6	7 to 8
Indicator score	0	1	2	3	4

E4 Channel bed natural physical features extent

A.6.28. The indicator is based on 11 features, of which 7 (exposed bedrock, exposed unvegetated boulders, exposed vegetated boulders, unvegetated mid channel bars, vegetated mid-channel bars, islands, cascades) are recorded as T (=2), P (=19) or E (=67) and 4 (pools, riffles, steps, waterfalls) are recorded as a count (here assigned 19 for a count of 1 and 67 for a count of more than 1). The total for all features is summed over all 5 modules in the subreach.

Table A.54 E4 Channel bed natural physical features extent condition indicator values and scores

Indicator value	0	>0 to 67	>67 to 201	>201 to 804	>804
Indicator score	0	1	2	3	4

E5 Channel bed natural physical feature richness

A.6.29. This indicator is a count of a possible 11 physical features (exposed bedrock, exposed unvegetated boulders, exposed vegetated boulders, unvegetated mid channel bars, vegetated mid-channel bars, islands, cascade, pools, riffles, steps, waterfalls) that are observed as P or E or have a count of at least 1. Each feature is only counted once giving a maximum value of 11 for the MoRPh5 subreach.

Table A.55 E5 Channel bed natural physical feature richness condition indicator values and scores

Indicator value	0	1 to 2	3 to 4	5 to 7	>7
Indicator score	0	1	2	3	4

E6 Channel bed material richness

A.6.30. The indicator is a count of the 9 possible mineral and organic materials (peat, organic, clay, silt, sand, gravel-pebble, cobble, boulder, bedrock) that are observed as P or E on the channel bed. Each material type is only counted once giving a maximum value of 9 for the MoRPh5 subreach.

Table A.56 E6 Channel bed material richness condition indicator values and scores

Indicator value	0	1	2	3 to 4	>5
Indicator score	0	1	2	3	4

E7 Channel bed siltation

A.6.31. The indicator records thin layers of fine sediments overlying coarser particles that either penetrate through the thin layer (patchy overlying silt layer) or whose form causes a clearly undulating fine sediment surface (continuous overlying silt layer). The indicator is the sum of the weighted abundances of any patchy silt layer (T=-2, P=-19, E=-67) and continuous overlying silt layer (T=-4, P=-38, E=-134) across the bed of all 5 modules in the subreach.

Table A.57 E7 Channel bed siltation condition indicator values and scores

Indicator value	0	<0 to -19	<-19 to -201	<-201 to -335	<-335
Indicator score	0	-1	-2	-3	-4

E8 Channel bed reinforcement extent

A.6.32. The indicator is the extent of bed reinforcement (T=-2, P=-19, E=-67) summed across all 5 modules of the subreach.

Table A.58 E8 Channel bed reinforcement extent condition indicator values and scores

Indicator value	0	<0 to -19	<-19 to -67	<-67 to -201	<-201
Indicator score	0	-1	-2	-3	-4

E9 Channel bed reinforcement materials severity

A.6.33. The indicator is the severity of the dominant bed reinforcement type observed in a MoRPh module. Values for each module are summed for the MoRPh5 indicator:

Table A.59 E9 Channel bed reinforcement materials severity scoring summary

	Dominant reinforcement type	**Severity**
CC	Concrete	-3
CB	Concrete & brick / laid stone (cemented)	-3

BR	Brick / laid stone (cemented)	-3
SP	Sheet piling	-3
WP	Wood piling	-2
RR	Rip-rap (large laid stone, uncemented)	-2
GA	Gabions	-2
BW	Builders Waste	-1
WO	Washed out	-1

Table A.60 E9 Channel bed reinforcement materials severity condition indicator values and scores

Indicator value	0	-1 to -2	-3	-4 to -12	<-12
Indicator score	0	-1	-2	-3	-4

E10 Channel bed artificial features severity

A.6.34. The indicator incorporates 7 artificial bed features which are assigned scores (see following table) to reflect the relative severity of their impact. The values for each module are summed across the 5 modules of the subreach:

Table A.61 E10 Channel bed artificial features severity scoring summary

Artificial feature	T	P	E
Large trash (car parts, trolleys, traffic cones etc)	-19	-152	-536
	Narrow	Int.	Wide
Bridge shadow	0	-19	-67
		Count >1	
Major weir		-536	
Intermediate weir		-152	
Minor weir		-19	
Bridge pier in river bed		-152	

Culvert	-1072

Table A.62 E10 Channel bed artificial features severity condition indicator values and scores

Indicator value	0	<0 to -19	<-19 to -152	<-152 to -536	<-536
Indicator score	0	-1	-2	-3	-4

E11 Channel bed NNIPS cover

A.6.35. This indicator combines the number and extent of up to 6 non-native invasive plant species (NNIPS) on the channel bed and any exposed in-channel features such as islands and bars by applying the following look-up table. Thus the indicator represents the total cover of NNIPS (6 possible species each assigned T=-2, P=-19 and E=-67). The results for the observed species are added for each module and then summed over 5 modules.

Table A.63 E11 Channel bed NNIPS cover scoring summary

Species	T	P	E
Himalayan balsam	-2	-19	-67
Japanese knotweed	-2	-19	-67
Giant hogweed	-2	-19	-67
Floating pennywort	-2	-19	-67
Other species 1	-2	-19	-67
Other species 2	-2	-19	-67

Table A.64 E11 Channel bed NNIPS cover condition indicator values and scores

Indicator value	0	<0 to -19	<-19 to -38	<-38 to -134	<-134
Indicator score	0	-1	-2	-3	-4

E12 Channel bed filamentous algae cover

A.6.36. The indicator is the extent (T=-2, P=-19 and E=-67) of filamentous algae on the channel bed and summed across the 5 modules of the MoRPh5 subreach.

Table A.65 E12 Channel bed filamentous algae cover condition indicator values and scores

Indicator value	0	<0 to -19	<-19 to -67	<67 to -201	<-201
Indicator score	0	-1	-2	-3	-4

Annex A Ditch Condition Assessment survey form

Condition Sheet: DITCH Habitat Type			
UKHab Habitat Type(s)		**Watercourse Name**	
Rivers and streams - Ditches			
Habitat Description		**Date & Time**	**Site**
Artificially created, linear water-conveyancing features that are less than 5 m wide and likely to retain water for more than 4 months of the year. Their hydraulic function is primarily for land drainage, and although partially or fully connected to a river system, they would not have been present without human intervention' *[Note: some heavily engineered ditches may actually be part of the river system (usually part of the headwater system). If there is uncertainty, consult historic maps, LIDAR data and riverine specialists]*			
Condition Assessment Criteria		**Pass/Fail**	
1	The ditch is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.		
2	A range of emergent, submerged and floating leaved plants are present. As a guide >10 species of emergent, floating or submerged plants in a 20 m ditch length.		
3	There is less than 10% cover of filamentous algae and/or duckweed (these are signs of eutrophication).		
4	A fringe of marginal vegetation is present along more than 75% of the ditch.		
5	Physical damage evident along less than 5% of the ditch, such as excessive poaching, damage from machinery use or storage, or any other damaging management activities.		
6	Sufficient water levels are maintained; as a guide a minimum summer depth of approximately 50 cm in minor ditches and 1 m in main drains.		
7	Less than 10% of the ditch is heavily shaded.		
8	There is an absence of non-native plant and animal species[1].		

Condition Assessment Result	Condition Assessment Score	Total Passes
Passes 8 of 8 criteria	Good (3)	0
Passes 6 or 7 of 8 criteria	Moderate (2)	**Final Condition Score**
Passes 0, 1, 2, 3, 4 or 5 of 8 criteria	Poor (1)	

Notes	Notes
Footnote 1 - Any species included on the Water Framework Directive UKTAG GB High Impact Species • Frequently occurring non-native plant species include water fern *Azolla spp.,* Australian swamp stonecrop *Crassula helmsii* , parrot's feather *Myriophyllum aquaticum* , floating pennywort *Hydrocotyle ranunculoides,* Japanese knotweed *Fallopia japonica* and giant hogweed *Heracleum mantegazzianum* (on the bank). • Frequently occurring non-native animals include signal crayfish *Pacifastacus leniusculus* , zebra mussels *Dreissena polymorpha* , killer shrimp *Dikerogammarus villosus* , demon shrimp *Dikerogammarus haemobaphes,* carp *Cyprinus carpio* .	

Appendix B Baseline Habitat and Hedgerow Condition & Strategic Significance Assessment

Table B.1 Baseline Habitat and Hedgerow Condition & Strategic Significance Assessment

Metric Habitat Type	Area (ha) Length (km)	Habitat Description	Condition Assessment	Strategic Significance Assessment	Habitat Units
Cropland - Cereal crops	73.44	Arable fields	No condition assessment required for cropland – **Condition Assessment N/A**	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low. **Low strategic significance.**	146.89
Cropland – Non-cereal crops	14.76	Range of non-cereal crops	No condition assessment required for cropland – **Condition Assessment N/A**	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low. **Low strategic significance.**	29.53
Grassland - Other neutral grassland	0.06	G3c6 *Lolium-cynosurus* other neutral grassland. Cattle grazed fields.	Failed grassland condition criteria B, C, E, F (Sward height, bare ground, physical damage, vascular species diversity) Passes 2 (out of 6) criteria - **Poor condition**.	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low. **Low strategic significance.**	0.24

Metric Habitat Type	Area (ha) Length (km)	Habitat Description	Condition Assessment	Strategic Significance Assessment	Habitat Units
Urban - Developed land; sealed surface	1.12	Existing road infrastructure.	No condition assessment required for urban – **Condition Assessment N/A**	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low. **Low strategic significance.**	0.00
Urban – Bare ground	0.01	Disturbed ground area at edge of farmyard compound.	Failed urban condition criteria A, B (Vegetation structure, specific diversity) Passes 1 of 3 core criteria (invasive species less than 5% cover) - **Poor condition**.	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low. **Low strategic significance.**	0.01
Line of trees	0.002 km	Newly planting line of trees adjacent to Marsh Road	Failed line of trees condition criteria A – D (Native species, continuous canopy, age diversity, adjacent habitat use) Passes 1 of 5 criteria (tree health) - **Poor condition**	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low. **Low strategic significance.**	0.004
Line of trees	0.004 km	Line of mature beech trees alongside gravel access track at edge of farm property.	Failed line of trees condition criteria B – D (continuous canopy, age diversity, adjacent habitat use)	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low.	0.01

Metric Habitat Type	Area (ha) Length (km)	Habitat Description	Condition Assessment	Strategic Significance Assessment	Habitat Units
			Passes 2 of 5 criteria (Native species, tree health) - **Poor condition**	**Low strategic significance.**	
Ecologically valuable line of trees	0.312 km	Line of trees, of varying ages, bordering access road parallel to Lord's Drain	Failed line of trees condition criteria B, D, E (continuous canopy, adjacent habitat use, tree health) Passes 2 of 5 criteria (70%+ native species, veteran features) - **Poor condition**	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low. **Low strategic significance.**	1.25
Ecologically valuable line of trees	0.043 km	Short line of immature trees, likely outgrown hedgerow, along Stone Gate lane.	Failed line of trees condition criteria D (adjacent habitat use). Passes 4 of 5 (70%+ native species, continuous canopy, veteran features, tree health) – **Moderate condition.**	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low. **Low strategic significance.**	0.34
Native hedgerow	0.455	Hawthorn hedgerow behind metal stock fence forming garden boundary.	Failed hedgerow condition criteria A2, C2, D1 (width, nutrient	As described in **Section 3.2.6**, all baseline strategic	1.82

Metric Habitat Type	Area (ha) Length (km)	Habitat Description	Condition Assessment	Strategic Significance Assessment	Habitat Units
			enrichment indicators, invasive species) Passes criteria A1, B1, B2, C1, D2) (height, gaps at base and canopy, undisturbed margin, damage) - **Moderate condition.**	significance is recorded as low. **Low strategic significance.**	
Native hedgerow	0.135	Intact native unmanaged field hedgerow.	Failed hedgerow condition criteria C2 (nutrient enrichment indicators) Passes criteria A1, A2, B1, B2, C1, D1, D2) (height, width, gaps at base and canopy, undisturbed margin, invasive species, damage) - **Good condition.**	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low. **Low strategic significance.**	0.81
Native hedgerow with trees – associated with bank or ditch	0.002	Hedgerow with trees along ditch at edge of farm parcel. Comprising elder, hawthorn, walnut.	Failed hedgerow condition criteria A1, B2, C2, D1, E1 (height, gap at canopy, nutrient enrichment indicators, damage, age diversity)	As described in **Section 3.2.6**, all baseline strategic significance is recorded as low.	0.02

Metric Habitat Type	Area (ha) Length (km)	Habitat Description	Condition Assessment	Strategic Significance Assessment	Habitat Units
			Passes criteria A2, B1, C1, D2, E2 (width, gaps at base, undisturbed margin, invasive species, tree health) - **Moderate condition.**	**Low strategic significance.**	

Appendix C Statutory Biodiversity Metric

[Refer to separate Statutory Biodiversity Metric excel spreadsheet submitted in support of the Planning Application – document reference GWNC-ARU-SS50-XXXXXX-RPT-ES-000016]

Appendix D Post-construction Draft Habitat Establishment, Management and Monitoring schedule

Table D.1 Post-construction Draft Habitat Establishment, Management and Monitoring Schedule

Management/ monitoring prescription	Jan -Mar	Apr-Aug	Sep-Oct	Nov-Dec	Year																														Responsible party
	■ Optimal period ☐ Alternative period				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
					X = Required action,														O = Action as required																
Grassland - Modified grassland																																			
Monthly cut or as required.	☐	■	■	☐	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	National Grid
Grassland - Other neutral grassland																																			
Maintenance of sward to approximately 100mm during first year to prevent domination of coarse grasses	■	☐	■	■	x																														National Grid
Cyclical mowing regime, with arisings removed • Cut 1 – end of July • Cut 2 – end of September (as required)		■	■			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	X	x	x	x	x	x	National Grid
Removal of undesirable species as required (including early March cut if necessary)	■	■				o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	National Grid
Monitoring annual check for undesirable species and prior to cut 1	■	■			x	x	x	x	x					x					x					x					X					x	National Grid
Individual trees - Rural tree																																			
Establishment activities (replacement of dead individuals, watering as required)	■	☐	☐	■	x	x	x	x	x					o					o					o					o					o	National Grid
Removal of undesirable species.	■	■				o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	National Grid
Monitoring		■			x	x	x	x	x					x					x					x					X					x	National Grid
Woodland and forest - Other woodland; broadleaved																																			
Establishment activities (replacement of dead individuals, watering as required)	■	☐	☐	■	x	x	x	x	x																										National Grid
Removal of undesirable species.	■	■				o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	National Grid

Management/ monitoring prescription	Jan -Mar	Apr-Aug	Sep-Oct	Nov-Dec	Year																												Responsible party
	■ Optimal period □ Alternative period				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
					X = Required action,														O = Action as required															
Selective thinning every 5 years to ensure structural variation.	■			■					x					x					x				x					x					x	National Grid
Hedgerow – Native species rich hedgerow																																			
Establishment activities (replacement of dead individuals, watering as required)	■	□	□	■	x	x	x	x	x																										National Grid
Removal of undesirable species.	■	■				o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	National Grid
Selective thinning every 5 years to ensure structural variation.	■			■					x					x					x				x					x					x	National Grid

Appendix E Post-construction Draft Outline Habitat Monitoring Criteria Tables

Table E.1 Grassland – Modified grassland

Condition indicator	Achievability & limiting factors (where applicable)	Target Scenario
There are 6-8 vascular plant species per m2 present, including at least 2 forbs (these may include those listed in Footnote 1). Note - this criterion is essential for achieving Moderate or Good condition. Where the vascular plant species present are characteristic of medium, high or very high distinctiveness grassland, or there are 9 or more of these characteristic species per m2 (excluding those listed in Footnote 1), please review the full UKHab description to assess whether the grassland should instead be classified as a higher distinctiveness grassland. Where a grassland is classed as medium, high, or very high distinctiveness, please use the relevant condition sheet.	Given the regular mowing regime and amenity purpose of this grassland it may not reach 6-8 species per m2.	Fail
Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for vertebrates and invertebrates to live and breed.	Given the regular mowing regime and amenity purpose of this grassland it will be uniform sward height.	Fail
Any scrub present accounts for less than 20% of the total grassland area. (Some scattered scrub such as bramble *Rubus fruticosus agg. may* be present).	Scrub establishment will be prevented through regular cutting regime.	Pass

Condition indicator	Achievability & limiting factors (where applicable)	Target Scenario
Note - patches of scrub with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.		
Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	Cutting regime likely to be conducted using light machinery and therefore unlikely to cause damage.	Pass
Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens)	Bare ground is not desirable, given the amenity purpose and therefore will not be aimed for.	Fail
Cover of bracken *Pteridium aquilinum* is less than 20%.	Bracken colonisation will be prevented through regular cutting regime.	Pass
There is an absence of invasive non-native plant species3 (as listed on Schedule 9 of WCA4).	INNS and indicators of sub-optimal condition will be managed through appropriate treatment (e.g. early season cut, hand pulling, digging or herbicide application where required).	Pass
	Total number of passes	Four
Good - –asses 6 or 7 criteria including essential criterion. Moderate - –asses 4 or 5 of criteria including essential criterion. Poor - –asses 3 or fewer criteria or fails essential criterion.		
	Post-construction target condition	Moderate

Table E.2 Grassland – other neutral grassland

Condition indicator	Achievability & limiting factors (where applicable)	Target Scenario
The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote 3 suboptimal species which may be listed in the UKHab description).1 Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.	Seeding of suitable species during establishment followed by suitable management regime should ensure indicative wildflowers are present throughout the sward	Pass
Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	Annual cut of grassland where sections can be kept at longer swards will see a variety in sward heights	Pass
Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens. Note - patches of scrub with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	It is expected that bare ground will be limited within the areas seeded with grassland.	Fail
Cover of bracken Pteridium aquilinum is less than 20% and cover of scrub (including bramble *Rubus fruticosus agg*.) is less than 5%.	Bracken and bramble colonisation will be prevented through cutting regime.	Pass

Condition indicator	Achievability & limiting factors (where applicable)	Target Scenario
Combined cover of species indicative of suboptimal condition and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area. If any invasive non-native plant species4 (as listed on Schedule 9 of WCA5) are present, this criterion is automatically failed.	INNS and indicators of sub-optimal condition will be managed through appropriate treatment (e.g. early season cut, hand pulling, digging or herbicide application where required)	Pass
There are 10 or more vascular plant species per m2 present, including forbs that are characteristic of the habitat type (species referenced in Footnote 3 and 5 cannot contribute towards this count). Note - this criterion is essential for achieving Good condition for non-acid grassland types only.	While this is desirable, a precautionary approach has been taken regarding this condition indicator.	Fail
	Total number of passes	Four
Good - –asses 5 or 6 criteria including essential criterion. Moderate - –asses 3 or 4 of criteria including essential criterion. Poor - –asses 2 or fewer criteria or fails essential criterion.		
	Post-construction target condition	Moderate

Table E.3 Individual Trees

Condition indicator	Achievability & limiting factors (where applicable)	Target Scenario
The tree is a native species (or at least 70% within the block are native species).	Planting specification includes only native species.	Pass
The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	Considered likely when subject to proper aftercare.	Pass
The tree is mature (or more than 50% within the block are mature)	Newly planted trees will not be mature.	Fail
There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.	Trees will be monitored, unlikely to be vandalised given the setting.	Pass
Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark. If any invasive non-native plant species4 (as listed on Schedule 9 of WCA5) are present, this criterion is automatically failed.	Newly planted tree are unlikely have ecological niches.	Fail
More than 20% of the tree canopy area is oversailing vegetation beneath.	Trees will be planted adjacent to arable fields and an existing road. It is assumed that 50% of the canopy will over sail arable field margins.	Pass
	Total number of passes	Four

Condition indicator	Achievability & limiting factors (where applicable)	Target Scenario
Good - Passes all 5 criteria. Moderate - Passes 3 or 4 criteria. Poor - Passes 2 or fewer criteria.		
	Post-construction target condition	Moderate

Table E.4 Other broadleaved woodland

Condition indicator	Good Condition (3 points)	Moderate condition (2 points)	Poor condition (1 point)	Achievability & limiting factors (where applicable)	Target Score
Age distribution of trees	Three age-classes present.	Two age-classes present.	One age-class present.	It is considered unlikely the woodland will achieve 'old' age class (150+ years) within the monitoring timeframe	2
Wild, domestic and feral herbivore damage	No significant browsing damage evident in woodland.	Evidence of significant browsing pressure is present in less than 40% of whole woodland.	Evidence of significant browsing pressure is present in 40% or more of whole woodland.	Deer likely to be present in the wider environment but not assumed that the browsing pressure will be significant.	3
Invasive plant species	No invasive species present in woodland.	Rhododendron (*Rhododendron ponticum*) or cherry laurel (*Prunus laurocerasus*) not present, and	Rhododendron or cherry laurel present, or other invasive species ≥10% cover.	Absence of invasive species in the local area will be maintained.	3

Condition indicator	Good Condition (3 points)	Moderate condition (2 points)	Poor condition (1 point)	Achievability & limiting factors (where applicable)	Target Score
		other invasive species <10% cover.			
Number of native tree species	Five or more native tree or shrub species found across woodland parcel.	Three to four native tree or shrub species found across woodland parcel.	Two or less native tree or shrub species across woodland parcel.	Considered likely that native species diversity will remain high through planting and management	3
Cover of native tree and shrub species	>80% of canopy trees and >80% of understory shrubs are native.	50 - 80% of canopy trees and 50 - 80% of understory shrubs are native.	<50% of canopy trees and <50% of understory shrubs are native.	Considered likely that native species diversity will remain high through planting and management.	3
Open space within woodland	10 - 20% of woodland has areas of temporary open space.		Open space within woodland	10 - 20% of woodland has areas of temporary open space.	
Woodland regeneration	All three classes present in woodland; trees 4 - 7 cm Diameter at Breast Height (DBH), saplings and seedlings or advanced	One or two classes only present in woodland.	No classes or coppice regrowth present in woodland.	Selective felling should allow for natural regeneration of canopy species over time.	2

Condition indicator	Good Condition (3 points)	Moderate condition (2 points)	Poor condition (1 point)	Achievability & limiting factors (where applicable)	Target Score
	coppice regrowth.				
Tree health	Tree mortality 10% or less, no pests or diseases and no crown dieback.	11% to 25% tree mortality and or crown dieback or low-risk pest or disease present.	Greater than 25% tree mortality and or any high-risk pest or disease present.	Assumed no change in tree health across monitoring timeframe.	3
Vegetation and ground flora	Recognisable National Vegetation Classification (NVC) plant community at ground layer present, strongly characterised by ancient woodland flora specialists.	Recognisable woodland NVC plant community at ground layer present.	No recognisable woodland NVC plant community at ground layer present.	Precautionary approach has been used.	1
Woodland vertical structure	Three or more storeys across all survey plots, or a complex woodland.	Two storeys across all survey plots.	One or less storey across all survey plots.	Considered likely that reduction of competition on trees through selective felling will allow for two storeys to develop.	2
Veteran trees	Two or more veteran trees per hectare.	One veteran tree per hectare.	No veteran trees present in woodland.	Considered unlikely that veteran trees will form during the monitoring timeframe.	1

Condition indicator	Good Condition (3 points)	Moderate condition (2 points)	Poor condition (1 point)	Achievability & limiting factors (where applicable)	Target Score
Amount of deadwood	50% of all survey plots within the woodland parcel have deadwood, such as standing and fallen deadwood, large dead branches and or stems, branch stubs and stumps, or an abundance of small cavities.	Between 25% and 50% of all survey plots within the woodland parcel have deadwood, such as standing and fallen deadwood, large dead branches and or stems, stubs and stumps, or an abundance of small cavities.	Less than 25% of all survey plots within the woodland parcel have deadwood, such as standing and fallen deadwood, large dead branches and or stems, stubs and stumps, or an abundance of small cavities.	It is assumed that limited deadwood will naturally form over the monitoring period. However, should deadwood material be available from the wider estate this should be utilised within newly created woodlands.	1
Woodland disturbance	No nutrient enrichment or damaged ground evident.	Less than 1 hectare in total of nutrient enrichment across woodland area, and or less than 20% of woodland area has damaged ground.	1 hectare or more of nutrient enrichment, and or 20% or more of woodland area has damaged ground.	Some nutrient enrichment may be present within the newly created woodlands.	2
				Total score >32 (33 to 39)	Good

Condition indicator	Good Condition (3 points)	Moderate condition (2 points)	Poor condition (1 point)	Achievability & limiting factors (where applicable)	Target Score
				Total score 26-32 Total score <26 (13 to 25)	Moderate Poor
				Viable post-construction target points (default poor condition defined user guidance)	26

Table E.5 Hedgerow – native species rich

Condition indicator			Achievability & limiting factors (where applicable)	Target Scenario
Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of the shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is >1.5 m height).	Assumed that upon establishment it will be maintained to at least this height.	Pass
Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees.	Assumed that upon establishment it will be	Pass

Condition indicator			Achievability & limiting factors (where applicable)	Target Scenario
		Outgrowths (such as blackthorn Prunus spinosa suckers) are only included in the width estimate when they are >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice).	maintained to at least this width.	
Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length	This is the vertical 'gappiness' of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	Assumed that upon establishment the hedgerow will have no gap at base.	Pass
Gap - hedge canopy continuity	Gaps make up <10% of total length; and	This is the horizontal 'gappiness' of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall 'gappiness' but are not subject to the >5 m criterion (as this is the typical size of a gate).	Assumed that upon establishment the hedgerow will have no gap at base.	Pass

Condition indicator			Achievability & limiting factors (where applicable)	Target Scenario
Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: · Measured from outer edge of hedgerow; and · Is present on one side of the hedgerow (at least).	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedgerow. Undisturbed ground is present for at least 90% of the hedgerow length, greater than 1 m in width and must be present along at least one side of the hedgerow. This criterion recognises the value of the hedgerow base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.	Not all hedgerows will have this throughout as paths will be located adjacent hedgerow.	Fail
Nutrient-enriched perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground.	The indicator species used are nettles Urtica spp., cleavers *Galium aparine* and docks *Rumex spp*. Their presence, either singly or together, does not exceed the 20% cover threshold.	Hedgerow is close to agricultural arable fields and pathways and it is considered unlikely that nutrient-enriched perennial vegetation will be <20%.	Fail
Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of WCA3) and recently introduced species.	Recently introduced species refer to plants that have naturalised in the UK since AD 1500 (neophytes). Archaeophytes count as natives. For information on archaeophytes and neophytes	Hedgerow will be maintained to be free of invasive species.	Pass

Condition indicator			Achievability & limiting factors (where applicable)	Target Scenario
		see the Joint Nature Conservation Committee website[4], as well as the BSBI website[5] where the 'Online Atlas of the British and Irish Flora'[6] contains an up-to-date list of the status of species. For information on invasive non-native species see the GB Non-Native Secretariat website.		
Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities.	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (for example, excessive hedgerow cutting).	Appropriate management will avoid causing damage to the hedgerow.	Pass
			Total number of passes	Six
Good – "No more than 2 failures in total; AND No more than 1 failure in any functional group." Moderate – "No more than 4 failures in total; AND Does not fail both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and C2 = Moderate condition)." Poor – "Fails a total of more than 4 attributes; OR Fails both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and B2 = Poor condition)."				
			Post-construction target condition	Moderate

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