MOTT MACDONALD

Dearne Reach Enabling Works

Biodiversity Net Gain Design Stage Report – Compound Only

March 2024

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March 2024

Issue and Revision Record

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Executive Summary

Mott MacDonald Limited has been commissioned by Mott MacDoanld Bentley on behalf of Yorkshire Water to undertake an assessment to inform a Biodiversity Net Gain (BNG) design of a temporary compound to enable the future construction of wetland creation and operational improvements (new pipeline and pumping station) to Clayton West Wastewater Treatment Works (WwTW) which will be located immediately adjacent to the Site. The BNG is to be delivered within the Site, therefore no off-site BNG delivery is required.

It is the intention for the project to achieve a target of 10% BNG in line with Kirklees Council target outlined in *Kirklees Council biodiversity net gain technical advice note* (Kirklees Council, 2001). This report is based on the finalised compound design as of January 2024.

To calculate the overall BNG percentage the pre-development (baseline) and post-development (proposed) value of the habitats and linear features within the Site were entered into the Natural England Biodiversity Metric 4.0 calculation tool (Natural England, 2023). The BNG assessment on this project has been prepared with reference to 'BNG: Good Practice Principles for Development' (CIEEM, CIRIA & IEMA, 2016) a set of ten guiding principles for delivering BNG in the UK.

It is proposed that the habitats on the Site are to be retained or reinstated as post-works completion, where possible. Where this is not possible, habitats will need to be re-created as an enhanced habitat. For example, if a section of hedgerow is anticipated to be lost; re-creation alone will not achieve BNG, therefore a species rich hedgerow will be re-created where sections of hedgerow are to be cleared. To achieve BNG the 5.7724ha of modified grassland is to re-instated in an enhanced condition, from poor to moderate, using a grass mix with a higher species composition that can withstand long term grazing. A native hedgerow of 0.3779km is to be enhanced from moderate condition to good condition, this will be achieved by placing a fence adjacent to the hedgerow to protect from grazing damages and improve hedgerow condition. An additional 0.0334km of species-rich hedgerow with trees is to be created to replace the 0.01km loss of line of trees and 0.0234km loss of native hedgerow.

The proposed design for the Site upon the completion of the works is predicted to achieve a 61.51% net gain in area habitats and a 17.45% gain in linear habitats, satisfying the trading rules for BNG.

A BNG management and monitoring plan (MMP) covering the immediate aftercare period following habitat creation and enhancement up to 30 years post-development, will be required and details for this have been outlined within this report. The MMP describes the habitat management and monitoring that will be undertaken, when it will be undertaken and who will undertake these commitments once the proposed works are completed.

1 Introduction

1.1 Overview

Mott MacDonald Limited was appointed by Mott MacDonald Bentley on behalf of Yorkshire Water to undertake a biodiversity net gain (BNG) design stage report for Dearne Reach. The Site is located adjacent to Litherop Lane, near Clayton West, Huddersfield (central grid reference SE 26923 12447). Proposals include the facilitation of the construction of a temporary compound to enable the future construction of wetland creation and operational improvements (new pipeline and pumping station) to Clayton West waste-water treatment works (WwTW) which will be located adjacent to the Site.

The project's BNG requirement is to achieve a 10% net gain in line with Kirklees Council target outlined in *Kirklees Council biodiversity net gain technical advice note* (Kirklees Council, 2001). This report has been prepared with reference to the framework provided in the CIEEM 'BNG Report & Audit Templates' document (CIEEM, 2021) for a 'BNG Design Stage Report'.

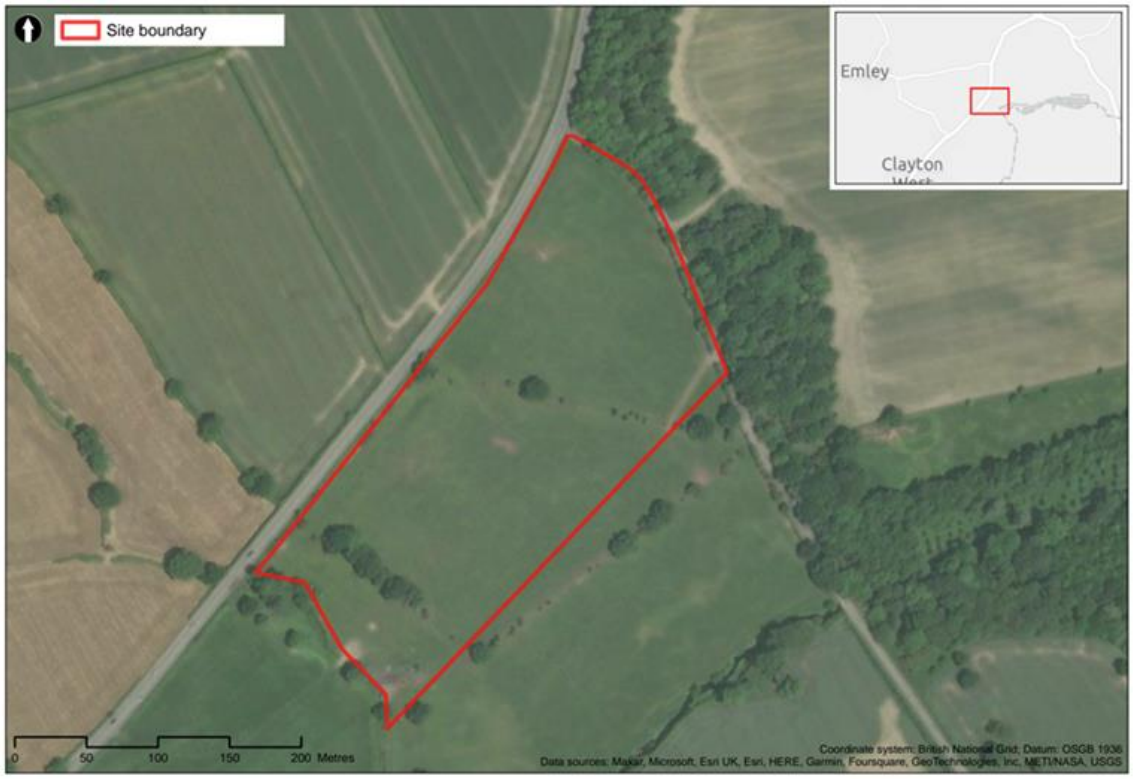
A BNG design stage report is aimed at decision-makers, e.g., Kirklees Council, at the design consent stage of a project. This report has been undertaken at the detailed design stage and fulfils the objective outlined in the CIEEM templates document to demonstrate the proposed BNG design to take through to the design consent stage (i.e., planning application submission).

This report contains recommendations based on measures for how the project can deliver BNG. These recommendations do not constitute a design for BNG. In submitting these recommendations, the Mott MacDonald Ecology Team has no design liability associated with the recommendations for BNG.

1.2 Site Location and Description

The proposed project boundary will hereafter be referred to as 'the Site', shown in Figure 1.1 below. The Site measures approximately 5.7ha in size and is comprised of predominantly of an modified grassland field used for grazing livestock. Habitats immediately surrounding the Site include arable fields with hedgerows and lines of trees, with a woodland to the east. The A636 is located immediately adjacent to the north of the Site, with Litherop Lane to the east and an modified grassland field for grazing livestock to the south and west. The River Dearne is located south of the Site, separated by a modified grassland field.

Figure 1.1: Proposed Red Line Boundary



Source: Mott MacDonald, 2024

1.3 Proposed Works

The temporary compound is to facilitate the construction of a wetland creation and operational improvements (new pipeline and pumping station) to Clayton West WwTW which will be located immediately adjacent to the Site.

The project objective will be achieved through the following scope of works:

- Large temporary compound used to facilitate the construction of wetlands and operational improvements (new pipeline and pumping station) at the WwTW. The compound is predicted to be in use for approximately 2 years.
- Temporary Site access from Litherop Lane.

1.4 Aims and Objectives

The aims of this report are to provide the findings of the BNG calculations undertaken as part of the BNG design for the project. The baseline and predicted post-development biodiversity units (BUs) have been calculated using the Biodiversity Metric 4.0 (Natural England 2023)[1].

The objectives of this report are to:

- Identify the Site's baseline habitat value in BUs, including area-based habitat units, and hedgerow units;

[1] The statutory Biodiversity Metric had been released at the time of writing this report. However, the Biodiversity Metric 4.0 was used in this report due to the condition assessments being undertaken using the Biodiversity Metric 4.0

- Quantify the BU outcomes and gain / loss percentage (%) for the planned works on the Site (as currently known), to determine if the development can achieve a sufficient net gain in each unit type that meets the Metric's trading rules;
- Quantify the on-site habitat creation and enhancement that is required for the development to achieve a sufficient net gain in each unit type; and
- Determine if there are any Very High Distinctiveness and / or irreplaceable habitats present on the Site that affects the ability of the development to achieve net gains.

1.5 Biodiversity Net Gain in Legislation and Local Policy

1.5.1 Legislation

The Environment Act 2021 sets out the key components of mandatory biodiversity gain. The legislation will mandate achieving a 10% increase in 'habitat units', as measured by the statutory biodiversity metric, for most Town and Country Planning Act (TCPA) developments (including Nationally Significant Infrastructure Projects). The mandatory requirement will come into effect on 12 February 2024 for TCPA developments and in 2025 for Nationally Significant Infrastructure Projects. They will legally require developers to ensure sites are improved for biodiversity, with a 10% increase in habitat value for wildlife compared with the pre-development baseline. All significant on-site habitat and off-site habitat must be secured for a minimum of 30 years (UK Parliament, 2021) with any net gain delivery sites recorded on a National Register.

At the time of planning submission, there is no legal requirement for permitted developments to deliver BNG.

1.5.2 National Planning Policy

Section 185b. of the National Planning Policy Framework (2023) states that "*planning policies and decisions should...identify and pursue opportunities for securing measurable net gains for biodiversity*" however the net gain requirement is not quantified (Department for Levelling Up, Housing and Communities, 2023).

1.5.3 Local Planning Policy

Kirklees Council states within its local plan (under Policy LP30 Biodiversity & Geodiversity; Strategic Green Infrastructure Network):

"All development in Kirklees, as set out in the national policy and the policies described on this document, will be expected to not result in significant loss or harm to biodiversity through avoidance, mitigation and compensatory measures and seek opportunities to enhance biodiversity value and ecological links. Opportunities to achieve net gains in biodiversity within development proposals will be sought through good design, including specific habitat creation and biodiversity enhancements. Regard will need to given to the relevant Biodiversity Opportunity zone in which the proposed development is located and biodiversity enhancement measures will be sought which reflect the priority habitats and species identified for each zone."

1.5.4 Yorkshire Water BNG targets

Yorkshire Water states within its Environmental Policy (2023):
"Aim to deliver a net gain to biodiversity across our assets and improve the ecological resilience of Yorkshire's rivers, coastal waters and catchments."

2 Methodology

2.1 Guidance

This report and BNG calculations have been informed by the following best practice guidance documents:

- BS8683 - Process for designing and implementing biodiversity net gain (British Standards Institute, 2021);
- Biodiversity net gain. Good practice principles for development. A practical guide (CIEEM, CIRIA & IEMA, 2019);
- Biodiversity net gain. Good practice principles for development. Case studies (CIRIA, 2019); and
- Biodiversity net gain report and audit templates (CIEEM, 2021).

2.2 Mitigation Hierarchy

The ecological mitigation hierarchy is central to the BNG process and is the first of the BNG Good Practice Principles. The ecological mitigation hierarchy, as set out in the National Planning Policy Framework (NPPF, 2023) and the National Planning Practice Guidance (NPPG) sets out the order in which the following measures should be implemented, in which avoidance of impacts should always be the priority:

Avoidance – development should be designed to avoid significant harm to valuable wildlife habitats and species.

Mitigation – where significant harm cannot be wholly or partially avoided, it should be minimised by design or through the use of effective mitigation measures.

Compensation – where, despite whatever mitigation would be effective, there would still be significant residual harm, as a last resort, compensation should be used to provide an equivalent value of biodiversity.

2.3 Data Collection Methods

2.3.1 Site Boundary

The Site boundary used for the BNG calculations is the red line boundary of the proposed development (see Figure 1.1).

2.3.2 Desk Study

A desk study was undertaken in August 2023 as part of a preliminary ecological appraisal (PEA) report (Mott Macdonald, 2023). This identified potential habitats of nature conservation priority within the survey area and provided context for assigning strategic significance scores to habitats in the BNG calculation. The desk study consulted the following sources:

- Defra's MAGIC Maps (2023):
  - Designated sites
  - Habitats
- Natural England:
  - Priority Habitat Inventory (Central) (England)
- Local records from Yorkshire Water Database 2023.

- Local Biodiversity Action Plan (LBAP) (Kirklees BAP, 2007)
- Field Survey (Mott MacDonald, 2023)

A field survey was undertaken as part of the PEA report (Mott Macdonald 2023) conducted on 2 August 2023 by Mott Macdonald with reference to the UK Habitat Classification (UKHab) methodology (Butcher *et al.*, 2020).

All habitat parcels were classified to Level 4 and mapped with reference to the Minimum Mapping Units (MMU) [see 2.3.4], habitat parcels smaller than the MMU) were mapped as point features and assigned secondary codes where applicable.

Habitat condition assessments were undertaken for each habitat parcel on 2 August 2023 with reference to the Technical Supplement for Biodiversity Metric 3.1 (Panks *et al*. 2022b). Data was recorded on whether the habitat parcel passed or failed each habitat condition criterion as well as the reason for failure where applicable.

2.3.3 Mapping

A fine scale MMU of 25m^2, 5m length was selected as the project requires detailed mapping.

Hedgerows / lines of trees were mapped as lines with no gap between these and adjacent area-based habitat polygons.

Baseline and post-development habitat maps were created in ArcGIS Pro (Esri, 2023) populated with aerial imagery base layer over which a File Geodatabase Feature Class (FGDB) was created containing:

- A Polygon Feature Class for Area Habitats;
- A Polyline Feature Class for Hedges; and
- A Point Feature Class for Individual Trees.

Each feature class of the FDGB has an associated ‘attribute table’ (a database containing information about the features created within the feature class). In addition to the pre-defined ‘attributes’, it is possible to add fields to the attribute table to further describe each feature. The ‘shape geometry’ was also included as an attribute, which meant the area or length of every feature (individual habitat polygon or line) was automatically measured by the software. The units selected for the measurements were metres and square meters to convey accuracy through any calculations prior to being converted to the hectares and kilometres required for the Metric calculation tool. To maintain accuracy throughout the assessment, four decimal places (e.g., 0.0001ha) were used within the metric area or length field. The metric accepts size measurements to any number of decimal places. However, the total area / total length results are displayed to two decimal places by the metric which may result in small rounding discrepancies but as per the user guide these rounding errors do not impact the results of the calculation tool (Natural England, 2023).

2.3.4 Strategic Significance

For each habitat area / line strategic significance was assigned based on the following methodology:

- **High**: Habitat type and location formally identified in local strategy, plan, or policy.
- **Medium**: Habitat type and location ecologically desirable but not identified in a local strategy, plan, or policy. Ecological desirability can be based on functional traits that the habitats have within that location such as connecting habitats, buffering habitats, and forming part of a core area of habitat within a locality. Most high and very high distinctiveness habitats will be of at least medium strategic significance.

- **Low**: Location not identified in a local strategy, plan, or policy and not ecologically desirable.

2.4 Calculation of Biodiversity Units

The Biodiversity Metric 4.0 (Natural England Joint Publication, 2023a) was used to perform the calculations in this report and determine net gain / loss percentages based on the baseline habitats and predicted post-development habitats. The methodology calculates separate gain / loss percentages for 'hedgerow' and 'area-based' habitats. The methodology also calculates for gain / loss percentages for 'watercourse' however this habitat is not applicable to this study.

Full details on how Biodiversity Metric 4.0 calculates BU change and percentage gain / loss based on the baseline and post-development habitat information inputted by the user is outlined in the Metric's User Guide (Natural England Joint Publication, 2023a).

2.4.1 Pre-development (baseline)

Biodiversity Units (BUs) for the Site 'pre-development' are based on the habitats present within the Site boundary prior to construction. Baseline habitat data for the Site was based the following information:

Table 2.1: Pre-development BNG data

Data Type	Baseline
Habitat type	• The habitat type for each habitat parcel on the Site, based on the UKHab survey conducted2 August 2023.
Habitat area / length	• The areas / lengths of each habitat parcel on the Site based on the UKHab survey and measured using GIS (see Section 2.3.3).
Habitat distinctiveness	• Scores of 'Very Low', 'Low', 'Moderate' 'High' or 'Very High' distinctiveness that are automatically assigned in the metric for each habitat area / length based on the type of habitat present.
Habitat condition	• Habitat condition data from the condition assessment survey, in which every area / length of habitat has been categorised as 'Good', 'Moderate' or 'Poor' condition.
Strategic significance	• Refer to Section 2.3.4 for details. • Strategic significance scores for each habitat parcel based on the following sources: – Defra's MAGIC.gov website (2024): – Natural England: – Priority Habitat Inventory (Central) (England) – Yorkshire water local record database – LBAP (Kirklees Biodiversity Action Plan, 2007) • One of the following options has been selected for each habitat area / length – Within area formally identified in local strategy – Location ecologically desirable but not in local strategy – Area / compensation not in local strategy / no local strategy

Source: Mott MacDonald, 2024

2.4.2 Post-development

BUs for the Site 'post-development' are based on the habitats predicted to be present (based on the proposed landscape design) following construction. Post-development habitat data for the Site was based on the following information:

Table 2.2: Post-development BNG data

Data Type	**Post-development**
Habitat type	• The habitat type for each habitat parcel on the Site, based in UKHab survey.

Data Type	Post-development
Habitat area / length	• The areas / lengths of each habitat parcel on the Site are based upon the CAD files and PDF design drawings provided.
Habitat distinctiveness	• Scores of 'Very Low', 'Low', 'Moderate' 'High' or 'Very High' distinctiveness that are automatically assigned in the metric for each habitat area / length based on the type of habitat present
Habitat condition	• With reference to the Metric Principle 6[2], a realistic and deliverable target habitat condition for each post development habitat parcel of 'Good', 'Moderate' or 'Poor' condition (Natural England Joint publication 2023a). • The current assumption is that the 5.7724ha of 'modified grassland' will be reinstated in 'Moderate' condition.
Strategic significance	• The strategic significance of the post-development habitats is determined using the same process as for the baseline habitats.
Habitat Creation Delay / Creation in Advance	• It is currently assumed the temporary compound will be in operation for two years; therefore, a two year delay in creation is expected.
Retention / enhancement	• The following habitats are to be retained /enhanced on Site: – 0.3779km of 'native hedgerow enhanced to 'good' condition from 'moderate'; – 0.1839km of 'native hedgerow with trees' retained in 'moderate' condition; – 0.1378km of 'line of trees' retained in 'poor' condition; and – 0.1815km of 'ecologically valuable line of trees' retained in 'poor' condition;

Source: Mott MacDonald, 2024

The Biodiversity Metric 4.0 (Natural England 2023) was used to perform the calculations in this report and determine net gain / loss percentage based on the baseline and predicted post-development habitat data. The methodology calculates separate gain / loss percentages for 'hedgerow' and 'area-based' habitats.

Full details on how Biodiversity Metric 4.0 calculates BU change and percentage gain / loss based on the baseline and post-development habitat information inputted by the user is outlined in the metric's User Guide (Natural England Joint Publication 2023a).

2.5 Metric Trading Rules

Once the calculations were complete, the outputs were reviewed to understand the losses and gains for each habitat type and understand whether the development complies with the Biodiversity Metric 4.0 trading rules (no trading down of habitat value).

Rule 3 of Biodiversity Metric 4.0 relating to trading down. Rule 3 is automatically applied and sets 'minimum habitat creation and enhancement requirements to compensate for specific habitat losses (up to the point of no net loss). These requirements are based on habitat type and distinctiveness'. This rule intends to prevent the development of BNG plans that compensate for the loss of biodiverse habitats by creating larger areas of less biodiverse habitats.

2.6 Assumptions and Limitations

Post-development target habitat condition scores are indicative and are dependent on the appropriate management and maintenance of the post-development habitats in accordance with the MMP. Effective implementation of the MMP will ensure the created habitats achieve their target condition and retained habitats maintain their condition for the duration of the BNG requirement. The target condition scores are based on a reasonable worst-case scenario where

[2] Metric Principle 6: *Habitat interventions need to be realistic and deliverable within a relevant project timeframe* (Natural England Joint Publication, 2023a).

the MMP is correctly implemented but Site conditions do not prove conducive to the habitats achieving good condition.

The BNG metric accounts for the inherent risk to all habitat creation and that some habitats are more difficult to create than others. Deviations from the standard risk multipliers for habitat creation used in Biodiversity Metric 4.1 have been avoided.

2.7 Quality Assurance and Competency Statement

All ecologists involved in the production of this report are members of Chartered Institute of Ecology and Environmental Management (CIEEM) and are bound by its code of professional conduct. All surveys and assessments have been undertaken using the recommendations in the BS 42020:2013 Biodiversity: Code of practice for planning and development (British Standards Institute, 2013).

The metric calculations were undertaken by an experienced ecologist and BNG practitioner with experience completing BNG calculations for several large development projects (using Biodiversity Metric 2.0, 3.0, 3.1 and 4.0), defined as a competent person under British Standard BS 8683:2021, the technical standard for designing and implementing BNG.

The qualifications and experience of the BNG assessors are set out in the competency statement (Table 2.3 below).

Table 2.3: Competency statement

Name	Years Experience	Role	Qualifications	Experience summary
LM	4	Ecologist	ACIEEM, MSc, BSc	Undertaken BNG calculations using Metric versions 3.1 and 4.0, undertook habitat condition assessments for small and large scale projects and authored BNG feasibility and design stage reports.
VA	10	Principal Ecology	ACIEEM, MSc, BSc (Hons)	Undertaken BNG calculations using Metric versions 2.0, 3.0, 3.1 and 4.0. Completed mitigation designs and strategies for several large infrastructure and utilities projects as BNG Regional Lead. Authored and reviewed BNG feasibility and design stage reports.
BC	15	Senior Associate – Ecology	CEnv MCIEEM, MRes, BSc (Hons)	Ecology Team Leader for Leeds and Sheffield Ecology Team. Involved with many BNG projects over the years using a number of different metrics. Also involved in the quality assurance process during reporting and has attended many internal and external CPD sessions to learn and improve knowledge of BNG.

Source: Mott MacDonald, 2024

As per the advice note from CIEEM (2019) *On the Lifespan of Ecological Reports & Surveys;* the findings presented in this report are valid for 12 months from the date of survey. After this date the report should be reviewed by a competent ecologist and an update ecology walkover (and subsequently a new BNG baseline assessment) may be required.

3 Baseline Conditions

3.1 On-site

The habitats on the Site mostly compromised modified grassland in the form of cattle grazed fields, with two lines of trees present (one identified as being of ecological importance) and two native hedgerows (one with trees) located along the north and east boundary of the Site. There were no priority habitats or irreplaceable habitats (Defra, 2023) identified within the Site boundary.

3.1.1 Baseline Habitat Value

The baseline habitats on the Site have been calculated as having a value of 11.54 Area Habitat BU and 4.51 Hedgerow BU. Summaries of the baseline area and linear habitats and their BU value are provided in Table 3.1 (Area Habitat BU), and **Error! Reference source not found.** (Linear habitat BU).

Refer to Appendix A – On Site Habitat Baseline map.

Refer to Appendix 1 – Habitat Condition Assessment for full details of each habitat parcel / linear feature assessed condition.

3.1.1.1 Area Habitats

Table 3.1: Baseline On-Site Area Habitats

Habitat Type (UKHab)	Metric Habitat Type	Total Area (ha)	Distinctiveness	Condition	Strategic Significance	Area-based BU
g4 Modified grassland	Grassland – Modified grassland	5.7724	Low	Poor	Area / compensation not in local strategy / no local strategy	11.54
Total		**5.7724**				**11.54**

Source: Mott MacDonald, 2024

3.1.1.2 Hedgerows

Table 3.2: Baseline On-Site Hedgerow Habitats

Habitat type (UKHab)	Metric Habitat Type	Total Length (km)	Distinctiveness	Condition	Strategic Significance	Hedgerow BU
Hedgerow (h2a)	Native hedgerow	0.3779	Low	Moderate	Location ecologically desirable but not in local strategy	1.66
Hedgerow (h2a)	Native Hedgerow with trees	0.2069	Medium	Moderate	Location ecologically desirable but not in local strategy	1.82
Line of trees (w1g6)	Line of trees	0.1478	Low	Poor	Area / compensation not in local strategy / no local strategy	0.30
Line of trees (w1g6)	Ecologically valuable line of trees	0.1815	Medium	Poor	Area / compensation not in local strategy / no local strategy	0.73
Total		**0.9141**				**4.51**

Source: Mott MacDonald, 2024

4 BNG Good Practice Principles for Development

This delivery of BNG for the Proposed Development has been undertaken with reference to the BNG Good Practice Principles for Development (CIEEM, CIRIA, IEMA, 2016), a set of ten guiding principles for delivering BNG in the UK.

Table 4.1 lists each of the good practice principles and provides a statement on how each has been applied as part of the BNG assessment for the Scheme.

Table 4.1: The BNG Good Practice Principles for Development and their Application on the Scheme

Principle	Description	Application on this scheme
Apply the mitigation hierarchy	Do everything possible to first avoid and then minimise impacts on biodiversity. Only as a last resort, and in agreement with external decision-makers where possible, compensate for losses that cannot be avoided. If compensating for losses within the development footprint is not possible or does not generate the most benefits for nature conservation, then offset biodiversity losses by gains elsewhere.	**Avoid** – To minimise the loss of habitats important to ecological connectivity, hedgerows and line of trees within the Site have been retained where possible. **Mitigate** - Upon completion of the works the grassland will be restored to its pre-development baseline. **Compensate –** To compensate for the temporary loss of hedgerows and line of trees, the habitats will be replaced with that of a higher distinctiveness.
Avoid losing biodiversity that cannot be offset elsewhere	Avoid impacts on irreplaceable biodiversity - these impacts cannot be offset to achieve No Net Loss or Net Gain.	No irreplaceable habitats were identified during the field surveys and therefore no irreplaceable habitat will be affected by the works.
Be inclusive and equitable	Engage stakeholders early, and involve them in designing, implementing, monitoring, and evaluating the approach to Net Gain. Achieve Net Gain in partnership with stakeholders where possible and share the benefits fairly among stakeholders.	Land not owned by Yorkshire Water but included in the BNG proposal will be reinstated (mostly modified grassland) and will need to be maintained in the condition for a minimum of 30 years. Approval of this must be discussed and agreed with landowners.
Address risk	Mitigate difficulty, uncertainty, and other risks to achieving Net Gain. Apply well-accepted ways to add contingency when calculating biodiversity losses and gains in order to account for any remaining risks, as well as to compensate for the time between the losses occurring and the gains being fully realised.	Post development habitats have been proposed as a like-for-like basis on existing habitats or with similar habitats in mind in keeping with the wider landscape and area use.
Make a measurable net gain contribution	Achieve a measurable, overall gain for biodiversity and the services ecosystems provide while directly contributing towards nature conservation priorities.	Yorkshire Water's internal policy is to deliver a net gain in biodiversity. Kirklees' advice is to achieve a minimum net gain of 10%, therefore this project has the aim of achieving at least a 10% net gain. This proposed design meets policy LP30, by minimising the impact to biodiversity and provide a biodiversity net gain and connectivity enhancement through good design. Upon completion, habitats are to be safeguarded and maintained for at least 30 years.

Principle	Description	Application on this scheme
Achieve the best biodiversity outcome	Achieve the best outcomes for biodiversity by using robust, credible evidence and local knowledge to make clearly justified choices when: ● Enhancing existing or creating new habitat. Enhancing ecological connectivity by creating more, bigger, better and joined up areas for biodiversity. ● Compensating for losses of one type of biodiversity by providing a different type that delivers greater benefits for nature conservation.	Where possible habitats have been retained, restored, and / or enhanced within the Site. This will make sure that habitats are not fragmented and remain connected for use of local species.
Be additional	Achieve nature conservation outcomes that demonstrably exceed existing obligations (i.e., do not deliver something that would occur anyway).	Sections of hedgerow that are being recreated are to be enhanced to improve species composition that does not currently occur within existing hedgerows in the area.
Create a net gain legacy	Ensure Net Gain generates long-term benefits by: ● Engaging stakeholders and jointly agreeing practical solutions that secure Net Gain in perpetuity ● Planning for adaptive management and securing dedicated funding for long-term management ● Designing Net Gain for biodiversity to be resilient to external factors, especially climate change ● Mitigating risks from other land uses ● Avoiding displacing harmful activities from one location to another ● Supporting local-level management of Net Gain activities	Stakeholders and Yorkshire Water are familiar with BNG requirements. Securing habitats for 30 years has been discussed and agreed. Upon completion of the works the land use for the on-site BNG delivery will remain as modified grassland and therefore no land practices will be displaced. The BNG management plan outlined has been written with the existing plan in mind to make sure that the regime is attainable.
Optimise sustainability	Prioritise Biodiversity Net Gain and, where possible, optimise the wider environmental benefits for a sustainable society and economy	Temporarily lost habitats will be reinstated and where possible enhanced post-development. Enhancing sections of hedgerow, which are connected to further hedgerow in the wider landscape, will help improve species composition of hedgerow habitats in the wider area, thus improving better habitat for foraging and commuting.
Be transparent	Communicate all Net Gain activities in a transparent and timely manner, sharing the learning with all stakeholders.	This report will provide all BNG calculations, proposed habitat with management plan and recommendations to achieve transparency within the BNG design.

Source: Mott MacDonald (2024)

5 Proposed Design

The target net gain outcomes are to achieve a minimum net gain of 10% whilst enhancing ecological connectivity and floral species composition within the Site.

For BNG, the target contribution towards nature conservation priorities are (BNG Good Practice Principle 5) maintaining ecological connectivity throughout the Site and to retain and enhance hedgerow habitats in line with the Kirklees BAP targets.

In order to deliver the target outcomes, the project design involves the reinstatement of the original grassland habitat in an improved condition. This will be achieved by using a seed mix containing a higher percentage of species that can withstand long term grazing to gain a species composition of more than six species per m².

Linear habitats such as hedgerows and line of trees are to be retained where possible. Sections of hedgerow are proposed to be lost during the enabling works, these are to be replaced with enhanced habitats with a higher distinctiveness. A section of hedgerow is to be enhanced by placing a fence adjacent to the hedgerow to protect it from grazing damage and allow recovery of any past damage.

The design is based on the proposed habitat plan provided by WSP in January 2024 and is summarised in sections 5.1 and 5.2.

The proposed habitat plan can be found in Appendix 1.

5.1 On-site

The project BNG design includes:

- Creation of 5.7724ha of Grassland – Other modified grassland (moderate condition).
- Creation of 0.0334km of Hedgerow – Species-rich native hedgerow with trees (moderate condition).
- Enhancing 0.3779km of existing native hedgerow in moderate condition, to native hedgerow in good condition.
- Retention of 0.1839km of Native hedgerow with trees (moderate condition), 0.1378km of line of trees (poor condition) and 0.1815km of ecologically valuable line of trees (poor condition).

5.2 Non-quantifiable biodiversity enhancements

Though the following recommendations have not been formally agreed with the client, the following have been recommended within the PEA report to enhance the Site for a number of generalist species:

- Integrating two general species bird boxes (e.g., Schwegler 1B boxes or similar) into the trees within the Site to create nesting opportunities;
- Integrating two wood-concrete bat boxes (e.g., Schwegler 2FN boxes or similar) into the trees within the Site to create roosting opportunities; and
- Any felled trees could be retained on Site and used to create log pile hibernacula for invertebrates, amphibians, reptiles and mammals.

5.3 Habitat Trading: Requirements

From the baseline habitats retained and cleared, the key habitat trading rules for this project to achieve BNG are:

- Habitats of low distinctiveness are to be replace with habitats of the same distinctiveness or a better habitat. 5.7724ha of modified grassland, which is a habitat with low distinctiveness, is to be removed and reinstated upon completion of the works in moderate condition.
- Hedgerows of medium distinctiveness are to be replaced with habitats of the same distinctiveness or a better habitat. 0.023km of native hedgerow with trees, which is a habitat of medium distinctiveness, is be cleared and replaced with 0.023km of species-rich native hedgerow with trees, which is a habitat of high distinctiveness.
- Hedgerows of low distinctiveness are to be replaced with habitats of the same distinctiveness or a better habitat. 0.01km of line of trees, which is a habitat of distinctiveness is to be cleared and replaced with 0.01km of species-rich native hedgerows with trees which is a habitat of high distinctiveness. 0.3779km of native hedgerow is be retained and enhanced from moderate condition to good condition.

6 BNG Metric

6.1 Area Habitats

Table 6.1: Post Development Site Area Habitats

Habitat Type (UKHab)	Metric Habitat Type	Habitat parcel(s)	Total Area (ha)	Distinctiveness	Condition	Strategic Significance	Retained / Enhanced / Created
g4 Modified grassland	Grassland – Modified grassland	1	5.7724ha	Low	Moderate	Area / compensation not in local strategy / no local strategy	Created
Total			**5.7724**				

Source: Mott MacDonald, 2024.

6.2 Hedgerows

Table 6.2: Post-development Site Hedgerow Habitats

Habitat Type (UKHab)	Metric Habitat Type	Habitat parcel ID	Total Length (km)	Distinctiveness	Condition	Strategic Significance	Retained / Enhanced / Created	Hedgerow BU
Hedgerow (h2a)	Native hedgerow	H2	0.3779	Low	Good	Location ecologically desirable but not in local strategy	Enhanced	2.38
Hedgerow (h2a)	Native hedgerow with trees	H3	0.1839	Moderate	Moderate	Location ecologically desirable but not in local strategy	Retained	1.62
Line of trees (w1g6)	Line of trees	H4	0.1378	Low	Poor	Area / compensation not in local strategy / no local strategy	Retained	0.28
Line of trees (w1g6)	Ecologically valuable line of trees	H5	0.1815	Medium	Poor	Area / compensation not in local strategy / no local strategy	Retained	0.73
Hedgerow (h2a)	Species-rich native hedgerow with trees	H3 / H4	0.0334	High	Moderate	Area / compensation not in local strategy / no local strategy	Created	0.29
	Total		**0.9145**					**5.29**

Source: Mott MacDonald, 2024.

6.2.1 Net Gain / Loss

Table 6.3 summarises the baseline BU (On-site and Off-site), estimated post-development BU (On-site and Off-site) and the total net BU percentage change (net gain / loss) in Area Habitat and Hedgerow BU.

The Biodiversity Metric 4.0 headline results can be found in Appendix D.

Table 6.3: Post-development BU Summary (In-combination)

Habitat type	On-site baseline BU	On-site Post-development BU	Off-site baseline BU	Proposed off-site post-development BU	Total net unit change
Area	11.54	18.65	n/a	n/a	7.10
Hedgerow	4.51	5.29	n/a	n/a	0.79
Total on-site net change plus off-site surplus				Area	**61.51%**
				Hedgerow	**17.45%**

Source: Mott MacDonald, 2024.

6.3 Habitat Trading: Results

Habitat trading rules are satisfied for all habitat unit changes across area habitats and hedgerow habitats with a cumulative surplus of 7.10 BU for low distinctiveness area habitats, a cumulative availability of 0.09 BU for medium distinctiveness hedgerow habitats and a cumulative availability of 0.79 BU for low distinctiveness hedgerow habitats.

7 Biodiversity Net Gain - Management and Monitoring Plan

7.1 Overview

The implementation of the management and monitoring plan (MMP) will be the responsibility of the contractor for the initial 5 years following construction and the client's responsibility the remaining 25 years. Details of the proposed creation and enhancement of the habitats and linear features within the Site should be detailed within the MMP.

This BNG 'management and monitoring plan' (MMP) should be produced and aim to provide a framework for long-term habitat enhancement, management and monitoring of the area of temporary compound for Dearne Reach at Clayton West. It is focused on reinstating the original habitat in an enhanced condition upon completion of the proposed works.

The implementation of this MMP runs from the start of construction of the project and for 30 years here after.

The MMP document is to be a 'live' document and should be updated as and when new or updated guidance becomes available, or as a result from ongoing monitoring activities, to make sure that the aims of the MMP are being met.

The MMP will form part of a legal agreement attached to the grant of a planning permission for the project.

An annual report will be submitted to the client (Yorkshire Water) which would comprise a schedule of works undertaken during the previous 12 months, the results of monitoring and where appropriate the development of habitats. It will also include proposals for the next 12 months.

The structure of the MMP is set out as follows:

- Aims, objectives and management prescriptions;
- Monitoring; and
- Management schedule.

7.2 Aims, Objectives and Management Prescriptions

7.2.1 Vision

Upon the completion of this plan at the end of the 30 year period, the vision for the Site is to consist of modified grassland in a good condition, and linear habitats in the form of hedgerows and tree lines that are connected to habitats in the wider area.

7.2.2 Aims

The MMP has the following aims:

- Aim 1: The land used for the enabling works is to be reinstated to its original habitat in keeping with the wider area and maintaining connectivity within the landscape.

The aim has related objectives which define quantifiable targets to fulfil the aims. Each objective has associated prescriptions which detail the indicative management works to be implemented

to achieve these aims and objectives. The objectives are divided by habitat type and detailed in Section 7.2.3 below.

A habitats condition status is defined by the criteria set out in UK Habitat Classification – Habitat Definitions V1.1 (Butcher *et al,* 2020). For the relevant UK Habitat Classification condition sheets refer to Appendix 1.

7.2.3 Objectives

Error! Reference source not found. summarises the management objectives and prescriptions required to achieve the aim for the Site. This should be read in conjunction with the proposed habitats plan (Appendix 1) for the location of the habitats proposed to be enhanced / created and managed within the Site.

Table 7.1: Summary of management objectives

Habitat	Habitat parcel ID	Objective	Management prescriptions
Grassland – Modified grassland	1	Reinstatement of 5.7724ha of modified grassland	Grazing to maintain grassland
Species rich native hedgerow with trees	H3 / 4	Replacement of 0.0234km of native hedgerow with trees, and the replacement of 0.01km of line of trees with species-rich native hedgerow with trees	Pruning to maintain hedgerow health
Native Hedgerow	H2	Enhancement of 0.3779km of native hedgerow from moderate to good condition	Installing of stock fencing at least 1m away from the base of the hedgerow to protect from livestock damage. Continual pruning to maintain hedgerow health.

Source: Mott MacDonald, 2024

7.2.3.1 Grassland – Modified grassland

The modified grassland that is to be lost during the enabling works is to be reinstated on a like for like basis using a seed mix that can withstand long term grazing (Aber HSG 3 Long Term Grazing). A ‘pull test’ should be carried out eight weeks post to seeding to ensure the grassland is ready for grazing. Grazing should only take place once the sward heigh has reached 10-12cm, lighter grazing should be used when grazing is established. This should be repeated for the first three to five grazing periods to promote herb species growth withing the sward.

7.2.3.2 Species rich native hedgerow with trees

The native hedgerow with trees that is to be lost during the enabling works is to be replanted as a species rich hedgerow with trees. The areas of hedgerow cleared is to be replanted using a planting mix compromising hazel *Corylus avellana,* hawthorn *Crataegus monogyna,* holly *Ilex aquifolium,* blackthorn *Prunus spinosa,* elder *Sambucus nigra* and guelder rose *Viburnum opulus* to ensure species richness within the hedgerow. The use of stakes and protection guards are to be implemented within the first five years whilst the hedgerow establishes. Upon establishment, the hedgerows should be cut during the dormant period of November to February on a two to three year rotation. Hedgerows should not be cut back more than 25% of its current height, to prevent gaps from occurring to maintain habitat connectivity.

7.2.3.3 Native Hedgerow

The native hedgerow that is to be enhanced should install stock fencing at least 1m away to provide protection and increase the overall protection and ground flower at the base of the

hedgerow. The hedgerow should continue to be managed through pruning following the current management regime for the hedgerow.

7.3 Monitoring

Monitoring is fundamental to the success of this MMP and is required to assess biodiversity changes and identify potential issues. It allows assessments of changes to be identified when compared to baseline data. This will not only enable the effectiveness of mitigation or compensation to be identified but will also inform future mitigation proposals on other Sites.

The lifetime of the project is 30 years. The following proposals for monitoring works are aimed to identify changes to the ecology of the Site and monitor the effectiveness of mitigation.

A Habitat Condition Assessment of the habitats within the Site should be carried out initially every year (Year 1 onward) until Year 5 and then every 5 years, in the summer months, to identify any habitats which could be enhanced or managed to increase biodiversity and to determine if the above enhancements and management has been successful. During this visit, potential for or evidence of protected species should be noted. This survey will be undertaken following best practice guidance using the UK Habitat Classification types following Natural England's Biodiversity Metric 4.0 Technical Supplement and associated condition assessment sheets (or the most up to date condition assessment guidance) (Natural England 2023).

7.4 Management Schedule

The management schedule should start at 'Year 0' which refers to the year of construction, Year 1 refers to the first year following construction. The management schedule should detail Year 0 and the first five years post construction (Year 1 – Year 5) with outline management for a 30-year MMP and will be updated at the end Year 5 and every five years.

Initial action to be undertaken by the contractor.

- The contractor overseeing the construction plan is responsible for following the proposed BNG design and management within the first 5 years. If any deviations occur an ecologist should be consulted to update the BNG calculations.

Management and monitoring action to be undertaken by the client.

- It is the client's responsibility to secure the land for a minimum of 30 years and ensure the actions within the MMP are carried out and update as necessary.

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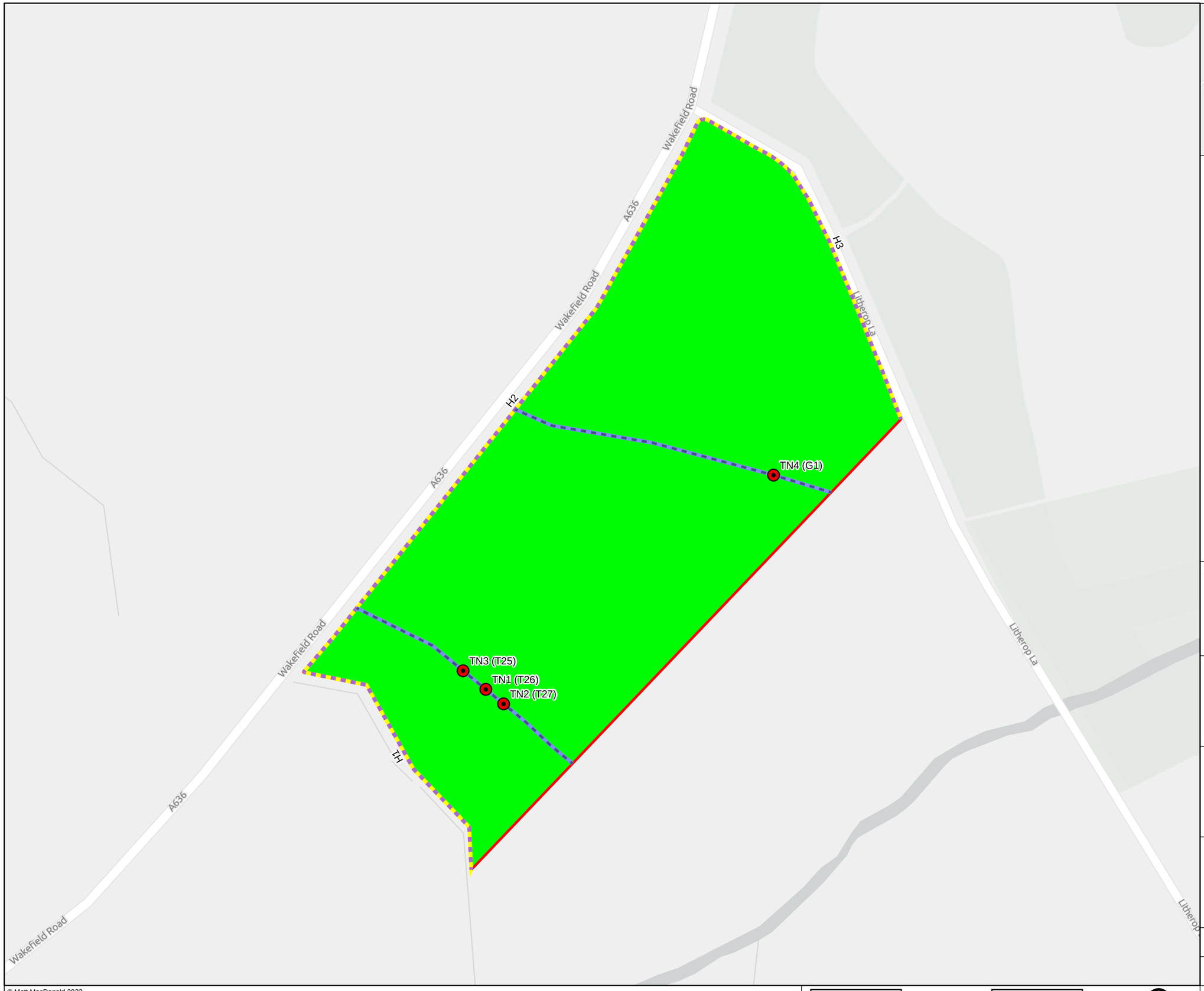
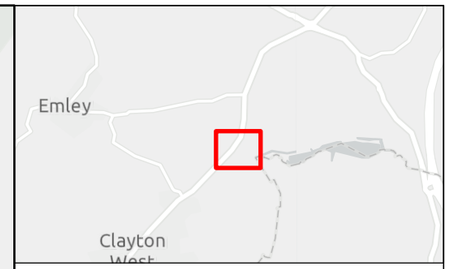
A. On-site Habitat Baseline Map





- Site boundary
- Target note
- h2, 75 - Hedgerows
- w1g6 - Line of trees
- g4, 103, 59 - Modified grassland

Coordinate system: British National Grid; Datum: OSGB 1936

Data sources:
Uk Habitat Classification: Mott MacDonald 2023.
Esri UK, Esri, HERE, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Contains OS data © Crown Copyright and database right 2023
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Dearne Reach
UK Habitat Classification

Drawn	GIS Checked	Checked	Approved
M Hargest	**F Lumb**	**S Smith**	**B Clarkson**
Scale at A3	Status	Revision	Security
1:2,000	**INF**	**01**	**STD**

0 50 100 150 Metres

YW.202043.02-MMB-WWT-WWT-RP-Z-0006

B. Habitat Condition Assessment Summary

Table B1: Habitat Condition Assessments

Habitat classification (UKHabs)	Condition sheet used	Condition	Justification	Brief description
Grassland – Modified grassland	Grassland – Low distinctiveness	Poor	Failed criterion A and B X – Fewer than 6-8 species per m2. X - Sward height not varied ✓ - Scrub cover <20% ✓ - Damage <5% ✓ - Cover of bracken <20% ✓ - Absence of INNS	Modified grassland made up a majority of the Site. The grassland was of a low sward height of approximately 10cm and is subject to frequent management in the form of livestock grazing (103, 59). The grassland was dominated by perennial ryegrass *Lolium perenne*, with abundant cover of white clover *Trifolium repens* and greater plantain *Plantago major* and rare occurrences of dandelion *Taraxacum officinale,* common nettle *Urtica dioica*, creeping thistle *Cirsium arvense* and creeping buttercup *Ranunculus repens*.
Native hedgerow	Hedgerow	Moderate	Failed criterion C1 and C2 ✓ - Average height >1.5m ✓ - Average width >1.5m ✓ - Gap between ground and base of canopy <0.5m for 90% of length ✓ - Gaps make up <10% of total length and no gaps are <90% X - >1m width of undisturbed ground with perennial herbaceous vegetation for 90% of the length X – Plant indicator indicative of nutrient enrichment of soils dominate <20% cover oof undisturbed ground. ✓ - 90% of hedgerow and undisturbed ground is free of invasives ✓ - 90% of hedgerow is free of damage caused by human activities.	Actively managed hedgerow subject to frequent management and dominated by hawthorn *Crataegus monogyna.* with abundant occurrences of blackthorn *Prunus spinosa* and elder *Sambucus nigra*.
Native hedgerow with trees	Hedgerow	Moderate	Failed criterion C1 and C2 ✓ - Average height >1.5m ✓ - Average width >1.5m	Actively managed hedgerow with trees subject to frequent management and dominated by hawthorn with abundant occurrences of blackthorn, elder and occasional

Habitat classification (UKHabs)	Condition sheet used	Condition	Justification	Brief description
			✓ - Gap between ground and base of canopy <0.5m for 90% of length ✓ - Gaps make up <10% of total length and no gaps are <90% X - >1m width of undisturbed ground with perennial herbaceous vegetation for 90% of the length X – Plant indicator indicative of nutrient enrichment of soils dominate <20% cover oof undisturbed ground. ✓ - 90% of hedgerow and undisturbed ground is free of invasives ✓ - 90% of hedgerow is free of damage caused by human activities. ✓ - There is more than one age-class present. ✓ - 95% of hedgerow trees are in a healthy condition	occurrences of English oak *Quercus robur,* and Ash *Fraxinus excelsior.*
Line of trees	Line of trees	Poor	Failed criterion B, D, E ✓ - At least 70% of trees are native. X - Gaps in canopy are <10% and <5m ✓ - Veteran features or natural ecological niches are present X – There is a undisturbed naturally vegetated strip of at least 6m on either side of tree line. X – >95% of trees in good condition.	A line of trees with trees semi mature in age and consisted of frequent occurrences of English oak, ash and hawthorn
Ecologically valuable line of trees	Ecologically valuable line of trees	Poor	Failed criterion B, D, E ✓ - At least 70% of trees are native. X - Gaps in canopy are <10% and <5m ✓ - Veteran features or natural ecological niches are present X – There is a undisturbed naturally vegetated strip of at least 6m on either side of tree line. X – >95% of trees in good condition.	A line of trees with trees semi mature in age and consisted of frequent occurrences of English oak, ash and hawthorn, considered of ecological value due to the connectivity of the habitat.

Source: Mott MacDonald, 2024

C. Landscape Plan of the Site Post Development

D. BNG Headline Results

Figure D1: BNG Headline Results

FINAL RESULTS		
Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	7.10
	Hedgerow units	0.79
	Watercourse units	0.00
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	61.51%
	Hedgerow units	17.45%
	Watercourse units	0.00%
Trading rules satisfied?	Yes ✓	

Source: Biodiversity Metric 4.0, 2024