



TUNLEY  
ENVIRONMENTAL

# BIODIVERSITY NET GAIN ASSESSMENT REPORT

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TRUSTED SUSTAINABILITY SCIENTISTS

# **BIODIVERSITY NET GAIN ASSESSMENT REPORT**

**FOR**

**Land adjacent to 480 Halifax Road,  
Liversedge, WF15 8DX**

**in collaboration with**

**BARNES HOMES**



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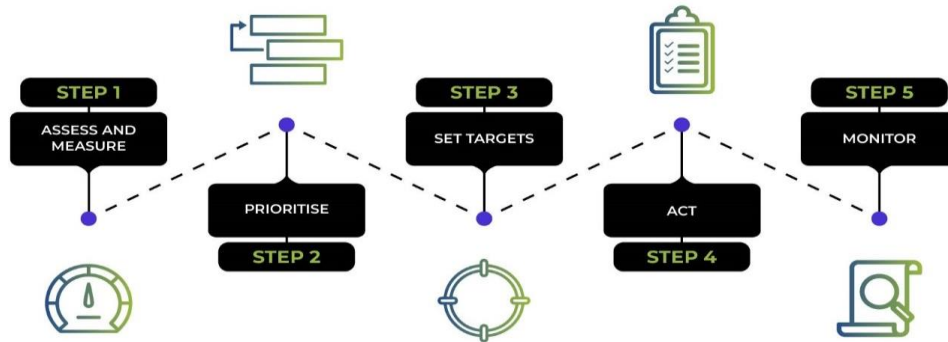
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## Nomenclature

Nomenclature	Description
Baseline Assessment	Before a development project begins, a baseline assessment is conducted to determine the existing biodiversity of the project site. This assessment establishes the current state of habitats, species, and ecosystem functions.
Biodiversity	The variety of life within a defined area for example, globally or in a specific habitat which can be described by a variety of metrics including species abundance or the living plant index and which we are dependent on to provide us with food, clean water and many more essentials.
Biodiversity Loss	The reduction in the variety and abundance of species in a particular ecosystem or across the entire planet. It can result from factors such as habitat destruction, pollution, climate change, and invasive species.
Biodiversity Net Gain	A concept that aims to ensure that development projects have a positive impact on biodiversity by enhancing or creating habitats.
Biodiversity Net Gain (BNG) Assessment	The quantification of the overall positive impact on biodiversity resulting from a specific activity or project. While biodiversity gain refers to the increase in the numbers, genetic variability, and species variety in a given area, BNG goes a step further by assessing whether the difference between biodiversity losses and gains leads to a net positive impact.
Biodiversity Units	A measure to describe the level of biodiversity present on a given site.
DEFRA Statutory (Official) Biodiversity Metric	Is a tool developed by the UK Government that provides a standardised approach to quantifying changes in biodiversity resulting from development activities. It assigns values to different habitats and species based on their ecological importance, and it allows for the calculation of a numerical score that reflects the overall biodiversity impact of a development.
Habitat	The specific environment or type of ecosystem in which a particular species of organism lives. Habitats can range from forests and wetlands to grasslands and urban areas.
Habitat Condition	The state or quality of a habitat, taking into consideration factors such as biodiversity, ecological processes, and overall health. Habitat condition assessment is essential in determining the effectiveness of conservation or restoration efforts.
Habitat Distinctiveness	The unique characteristics and features that differentiate one habitat from another. Distinctiveness is often assessed based on the diversity of species, ecological functions, and physical attributes of a habitat.
Habitat Strategic Significance	The local importance of a habitat determined by assessing both its geographic location and the specific type of habitat it represents. This evaluation helps in understanding the unique value and contribution of the habitat in its surrounding ecosystem.
On-Site	Refers to activities, impacts, or features that occur within the boundaries of a specific development or project site. In the context of Biodiversity Net Gain, on-site measures may include habitat creation, enhancement, or protection within the project area.
Off-Site	Relates to actions or effects that occur outside the boundaries of the development or project site. Off-site measures in Biodiversity Net Gain may involve compensatory actions, such as creating or enhancing habitats in a different location to offset any biodiversity loss caused by the development.
Small Site	A small residential site is a development which is less than 1 hectare with less than 9 dwellings, or where the number of dwellings is unknown an area of less than 0.5 hectares. A small commercial site is a development which has created floor space of less than 1,000 m <sup>2</sup> or with a total site area of less than 1 hectare.
Major Development	A major development is any development, either residential or non-residential, which falls out of the requirements of a small site. This means more than 9 dwellings or greater than 0.5 hectares for residential developments or greater than 1,000 m <sup>2</sup> floor space, or over a hectare for non-residential developments.

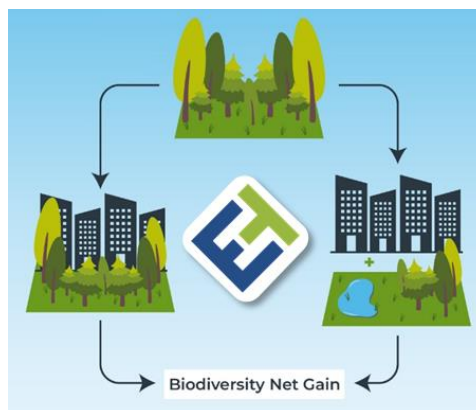
## Methodology and Quantification Standards

This Biodiversity Net Gain (BNG) report has been completed using methodology consistent with the Science Based Targets for Nature (SBTN), Nature Positive Initiatives, and DEFRA Regulations.



Science-Based Targets for Nature Steps which Tunley Environmental's Biodiversity Net Gain (BNG) services aligns with to achieve reduced impact on Nature.

Biodiversity was quantified using the DEFRA (Department for Environment, Food & Rural Affairs) statutory (official) biodiversity metric as a tool to assess and measure biodiversity in the context of development projects. This metric is specifically designed to assist in quantification of the impact that development activities have on biodiversity and determine whether Biodiversity Net Gain (BNG) is achieved. Where BNG refers to the idea that the biodiversity value of a site should be enhanced due to development, ensuring a "net gain" in ecological terms. Tunley have completed all calculations within small site metric along with any required documents such as habitat condition. These additional documents will be submitted alongside this form in the excel format for LPA approval.



Tunley Environmental's conceptualisation of Biodiversity Net Gain.

Where applicable, the equivalent small site biodiversity metric was utilised for developments under the requirements for the statutory (official) biodiversity metric. The BNG assessment was further completed using methodology consistent with the international standard BS 8683:2021 (Process for designing and implementing BNG). Information on data sources and assumptions made to support this analysis are provided in Appendix A.

## Executive Summary

Biodiversity is the foundation of the global economy. The World Economic Forum (WEF) estimates that over 50% of the world's GDP, equivalent to 33 trillion pounds, significantly depends on nature and the services it provides. However, biodiversity is amid a severe global crisis. Human-induced changes in land and sea use, overexploitation, invasive species, pollution, and climate change are the primary drivers of rapid biodiversity decline. Human activity threatens approximately a million species with extinction, some within decades, and species are disappearing at a rate of tens to hundreds of times faster than the natural pace.

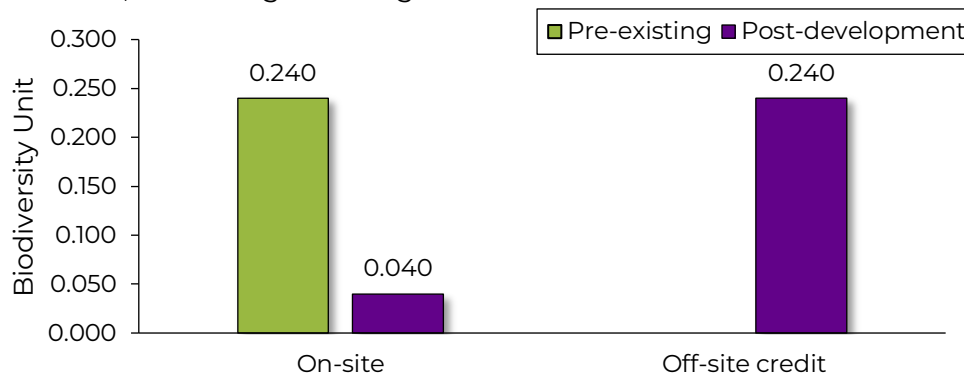
Biodiversity net gain is a concept implemented into the *Town and Country Planning Act 1990* that aims to ensure that development projects in the UK, specifically England, have a positive impact on biodiversity by enhancing or creating habitats either on-site or off-site.

The land adjacent to 480 Halifax Road, Liversedge, WF15 8DX is a predominantly vacant site having suffered from fly tipping. The site has two areas of deciduous woodland and no designated sites within [500 m](#). The site is being developed from its artificial unvegetated/unsealed surface by building three bungalows with landscapes. The site has a total area of 954 m<sup>2</sup> and therefore as stated in the Town and Country Planning Act, this site is classified as a small site.

Tunley Environmental have conducted an independent assessment to quantify biodiversity values of a site in pre-existing condition and after development. As the site had suffered from fly tipping, Barnes Homes invested significant resources in clearing the site. Barnes Homes have then discussed this complex situation and the necessity of the site clearance with the LPA. It is agreed that a pre-development scenario can be considered to comprise mainly artificial unvegetated, unsealed surface (due to fly tipping) and urban trees.

Due to the lack of photo evidence of the pre-existing condition (prior to the site clearance), Tunley Environmental used satellite images in 2020 and considered six small trees and an introduced shrub on site. The majority of the area was made up of artificial unvegetated/unsealed surface. Total biodiversity value at pre-development is 0.24.

Within the proposed development, there are plans to create vegetated garden and developed land; sealed surface; replacing the current unvegetated land. These initiatives will create 0.04 'area habitat' unit on-site. The project would not meet the 10% BNG requirement. Therefore, Barnes Homes propose to plant four medium trees and three small trees at an off-site land in their ownership; this measure results in a total post-development value of 0.28 units, translating to a net gain of 19.8%.



**Figure 1.** Total biodiversity units of the site.

## Introduction

Biodiversity is the foundation of the global economy. The World Economic Forum (WEF) estimates that over 50% of the world's GDP, equivalent to 33 trillion pounds, significantly depends on nature and the services it provides. However, biodiversity is amid a severe global crisis. Human-induced changes in land and sea use, overexploitation, invasive species, pollution, and climate change are the primary drivers of rapid biodiversity decline. Human activity threatens approximately a million species with extinction, some within decades, and species are disappearing at a rate of tens to hundreds of times faster than the natural pace. Between 1970 and 2016, populations of mammals, birds, amphibians, reptiles, and fish have, on average, decreased by 68%. Human activity has dramatically altered 75% of the land surface, significantly impacted 66% of the ocean, and led to the loss of 85% of wetlands.

Recognising the severity of this crisis, the integration of Biodiversity Net Gain (BNG) and ecosystem restoration emerges as a crucial strategy for mitigating the adverse effects of human activities on biodiversity. BNG aims to ensure that development projects not only avoid causing harm to ecosystems but actively contribute to a net positive impact on biodiversity. By implementing measures such as habitat creation, restoration, and protection, BNG seeks to counterbalance the negative ecological footprint of development.

This BNG assessment calculates the biodiversity value of the land by evaluating the number of habitats present, the habitat types, size, condition, and location. Below shows the most recent aerial image of the site at (Figure 2).



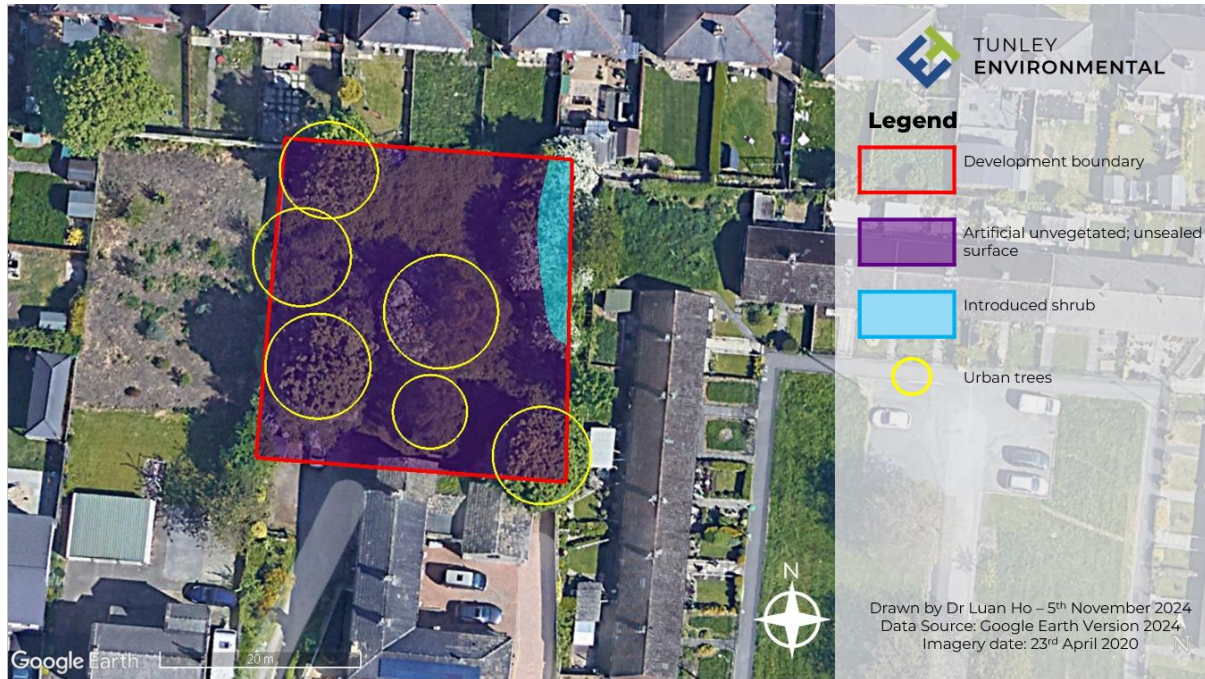
**Figure 2.** Aerial image of the site at Land adjacent to 480 Halifax Road

## Pre-development Results

Prior to analysing the biodiversity units post development we must conduct a baseline assessment on the site pre-development. This baseline assessment is conducted to determine the existing biodiversity on the project site. This assessment establishes a pre-

existing state of habitats, species, and ecosystem functions on site. The pre-existing condition was considered as a baseline (this is agreed between Barnes Homes and the LPA due to the complex fly tipping situation of the site), comprising of artificial unvegetated/unsealed surface, introduced shrub and urban trees.

A map of the habitats identified from these images is overlaid into the aerial image above in Figure 3.



**Figure 3.** Mapping of pre-development habitats on site.

For the proposed site for development, biodiversity units were identified pre-development (Figure 3 and Table 1). The [UK habitat classification \(UKHab\)](#) system is utilised to define habitats inputted within the metric. The habitat identified on-site for this project is artificial unvegetated, unsealed surface, introduced shrub and six small urban trees. All of these habitats were previously removed due to the site clearance.

**Table 1.** Explanation of pre-development habitat types, habitat characteristics, and habitat area/length.

Habitat Type	Habitat Characteristics	Habitat Area	Unit	Condition	Biodiversity Units
Artificial unvegetated, unsealed surface	Human-made surfaces that are not vegetated and are not sealed with impermeable materials.	906.3	m <sup>2</sup>	N/A - Other	0
Introduced shrub	Shrubs that have been planted and are not native to the area.	47.7	m <sup>2</sup>	Condition Assessment N/A	0.01
Urban trees	Individual trees located in urban environments.	244.17	m <sup>2</sup>	Moderate	0.23
<b>Total of "area" habitats (already lost)</b>					<b>0.24</b>

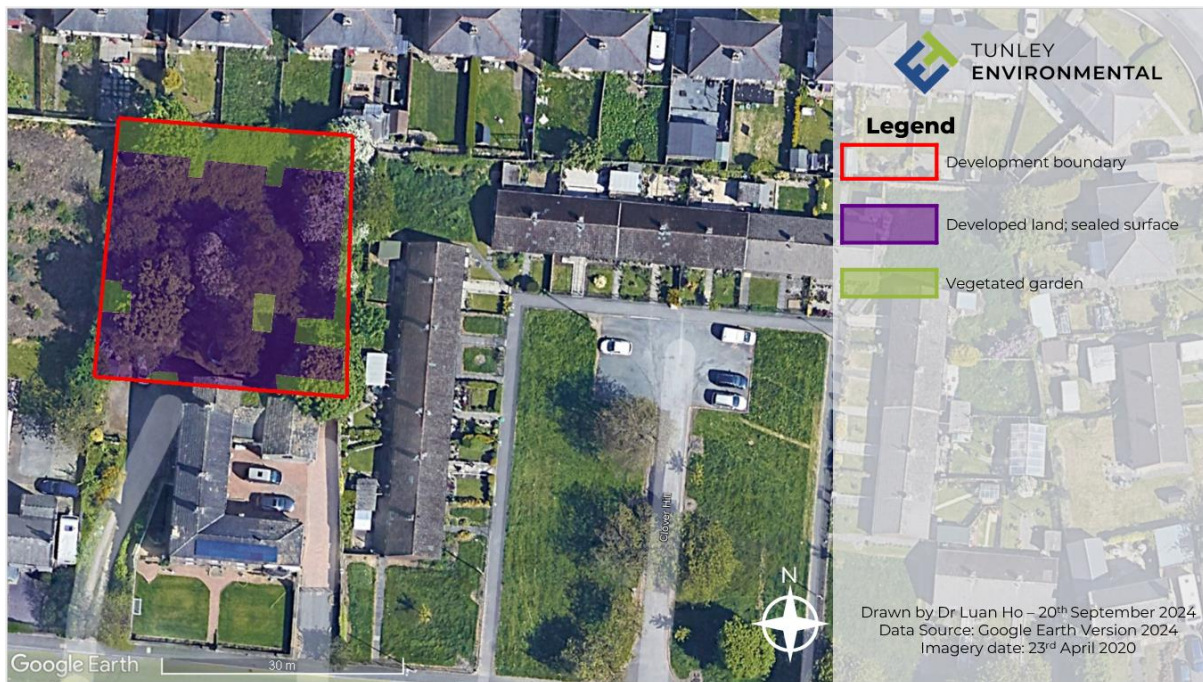
## Biodiversity Net Gain Results

The plan below (Figure 4) shows the proposed site landscape developed and designed.



**Figure 4.** Proposed plan for the site.

These changes in habitats were taken into account through the calculation of their areas, provided by and verified with an aerial view map, as seen in Figure 5.



**Figure 5.** Mapping of different habitats post-development.

All of the 954 m<sup>2</sup> artificial unvegetated/unsealed surface and introduced shrub will be lost during development, and the plan creates developed land/sealed surface and vegetated garden (Table 2). The incorporation of these new habitats creates 0.04 biodiversity units, which brings the site to a total of only 0.04 biodiversity unit post-development.

Barnes Homes plan to plant four medium trees and three small trees at an off-site land at Churchfield Farm, Church Lane, Hartshead, WF15 8ET. This site is located within the same LPA's boundary with the development considered in this assessment; therefore, Tunley Environmental did not consider a spatial risk multiplier category.

**Table 2.** Explanation of habitat type, habitat characteristics, and habitat area of all habitats to be created post-development.

Location	Habitat Type	Habitat Characteristics	Habitat Area	Unit	Condition	Biodiversity Units
On-site	Vegetated garden	Gardens that support a variety of plants.	228.70	m <sup>2</sup>	Condition Assessment N/A	0.04
On-site	Developed land; sealed surface	Areas where the surface has been sealed by materials such as concrete, tarmac, or buildings.	725.30	m <sup>2</sup>	N/A - Other	-
Off-site	Urban trees (4 medium trees)	Individual trees located in urban environments. Diameter at breast height less than or equal to 30 cm	122.1	m <sup>2</sup>	Moderate	0.04
Off-site	Urban trees (3 small trees)	Individual trees located in urban environments. Diameter at breast height greater than 30 cm, but less than or equal to 60cm	651.1	m <sup>2</sup>	Moderate	0.20
<b>Total of "area" habitats created</b>						<b>0.28</b>

## Evidence of Site Clearance

The site had suffered significantly from fly tipping. Barnes Homes implemented plans to clear the waste and prepared the site for construction work (subject to planning permission granted).



**Figure 6.** Photos of site demonstrating previous site condition.

## Conclusion

The BNG assessment by Tunley Environmental have confirmed that the site at the land adjacent to 480 Halifax Road, WF15 8DX will meet the national standard of 10% biodiversity

net gain by implementing vegetated garden on-site and plant trees at an off-site land in their ownership. The total net gain is 19.8%.

## Appendix

### Data Sources

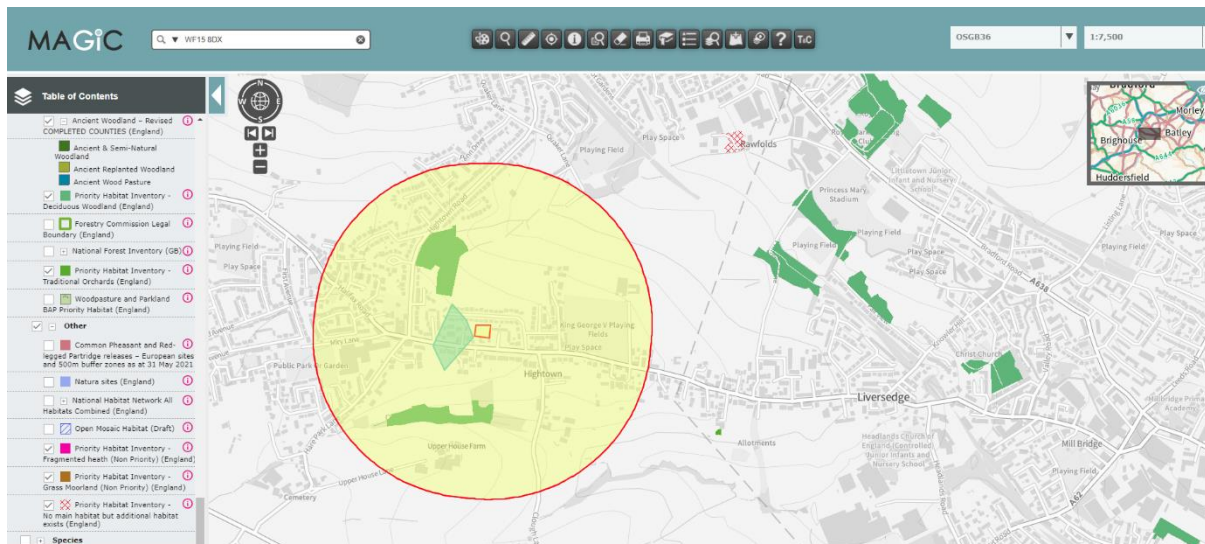
All data results were analysed through the small site metric from DEFRA. The excel version of the metric will also be submitted alongside this report for further evidence and LPA approval and for compliance with BNG regulations.

### Habitat Classification and Justification

We conducted a thorough assessment of all habitat types utilising the guidelines outlined in "The UK Habitat Classification Version 2" (UKHab). UKHab serves as a comprehensive, hierarchical system that integrates seamlessly with existing classifications in the UK and Europe. It's architecture, inclusive of primary habitats and secondary codes, enhances the accuracy and consistency of habitat assessments by allowing for the direct attachment of additional features such as habitat mosaics and management strategies. This approach not only facilitates the integration of legacy datasets but also enables efficient sharing of habitat data at regional, national, and international levels. BNG Compliance adheres to these classifications, ensuring consistency and compliance with ecological standards. It's essential that a trained and certified ecologist completes the assessment. For more information, please visit: [UKHab](https://www.ukhab.org/).

### Magic Map Results

The site is with two areas of deciduous woodland and no designated sites within 500 m (but not onsite).



### Competency

**Dr Luan Ho, MEnvSc, BEng** is a Full Member of The Institution of Environmental Sciences. This title is gained through his in-depth experience and knowledge in environmental sciences. Luan is a senior scientist at Tunley Environmental, having completed over 30 hours of training through in-house procedures and attended UKHab training, making him competent to conduct BNG assessments, provided the habitats are signed off by an in-house ecologist.

**Tara Garraty**, BSc, MSc, PhD (Pending), is a certified ecologist (holding three higher education degrees in conservation and ecology) with over 15 years of experience in sustainability and conservation. She has led ecological surveys in the UK and Tropics, gaining hands-on experience in diverse ecosystems. Tara has completed professional training with Natural England, CIEEM, and UKHab, focusing on Biodiversity Net Gain (BNG) regulations and UK habitat identification. She remains committed to ongoing training to stay current with BNG standards. At Tunley, she created and facilitated “Navigating Biodiversity Net Gain regulations” CPD sessions, showcasing her leadership and expertise in ecology and BNG regulations.

**Dr Aaron Yeardley** is the Science Team Co-Lead at Tunley Environmental. He is a Sustainability Scientist who has completed over 20 hours of training through in-house procedures, UKHab webinars, and other accreditations such as CIEEM, making him competent to conduct BNG assessments, provided the habitats are signed off by an ecologist.

## Approval

Author:	Dr Luan Ho, MIEEnvSc, BEng
Position:	Science Team Co-Lead
Written Date:	20 <sup>th</sup> September 2024
Peer-reviewed by:	Dr Aaron Yeardley, AMIChemE, MEng
Position:	Science Team Co-Lead
Reviewed Date:	20 <sup>th</sup> September 2024
QA approved by:	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Revision: N/A Tara Garraty BSc, MSc, Phd (pending)
Position:	Biodiversity Specialist and Sustainability Scientist
Approval date:	23 <sup>rd</sup> September 2024
Reference:	BarnesHomes_HalifaxRoad-BNG_24-2-B
Revision:	B

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				QA: AY	6 <sup>th</sup> Nov 24
C					
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E					
F					

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