

One Planet Development Management Plan
Land at Lower Wych

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1.Introduction

1 Introduction

This Management Plan accompanies an application for One Planet Development at Lower Wych, near Wrexham. It has been structured to follow the headings used in Technical Advice Note 6 (TAN 6) and the accompanying One Planet Development Practice Guidance so that each policy requirement can be checked directly against the supporting evidence later in the document.[1][2]

OPD Practice Guidance § 1.9 identifies six essential characteristics for One Planet Development in the open countryside:

- a light touch on the environment;
- land-based provision for minimum needs within five years;
- a low ecological footprint;
- very low carbon buildings;
- a binding management plan reviewed every five years; and
- sole residence for the named occupants.[1]

This introductory section summarises the proposal, explains the purpose of the Management Plan, and signposts where detailed evidence is provided. Detailed technical descriptions of the enterprises, buildings, energy systems, waste systems and transport arrangements are therefore dealt with in the later sections rather than repeated here.

1.1 Overview of Proposal

The proposal is for a single-household One Planet Development on 5.12 acres (2.07 hectares) of agricultural land at Lower Wych, Wrexham County Borough, Wales. The holding is intended to support a low-impact rural livelihood based on food production, small-scale processing, land management and associated on-site infrastructure.

[redacted]

We have taken a policy-first approach to this proposal. Before acquiring the land, we reviewed Technical Advice Note 6, the OPD Practice Guidance, Planning Policy Wales and a range of approved OPD applications across Wales, and used that work to define the criteria for a suitable site: scale, aspect, soil, access, relationship to services, family support networks and known planning constraints. Lower Wych was identified because it met those criteria, not because it was land we already owned or a predetermined house plot.

[redacted]

This proposal is for a four-person household on 5.12 acres (2.07 hectares), with low-impact buildings based on the WikiHouse timber-cassette construction system (an open-source, CNC-cut structural system using interlocking OSB/plywood cassettes; see Section 8 for the construction strategy and Building Regulations approach). The Management Plan has therefore been prepared to evidence the proposal at that scale. The Business and Improvement Plan, Ecological Footprint Analysis and Zero-Carbon Buildings strategy carry the detailed evidence for household needs, land-based income, footprint performance and building impacts; this Introduction signposts that evidence rather than repeating it.

1.1.1 The Applicants

[redacted]



1.2 Vision and Rationale

Our aim is to establish a smallholding that can meet household needs while improving the environmental condition of the site. We are motivated by a simple premise: food production, housing and livelihood should work with land and local ecosystems rather than rely on distant, high-input systems. The proposal is therefore based on three linked propositions: the land should provide a substantial part of the household's food and income; buildings and infrastructure should be low-impact in construction and use; and the development should leave the site in better ecological condition than it is at present.

The site sits within a network of environmental and mineral planning constraints that have shaped the proposal from the outset. Part of the site sits adjacent to the Doley Wood and Meadows Local Wildlife Site, forming part of the Wych Brook / Wych Valley ecological corridor; the holding is within the hydrological catchment upstream of the River Dee and Bala Lake Special Area of Conservation; and the site is identified within the Wrexham aggregates safeguarding context for sand and gravel. These matters are addressed throughout the Management Plan: the baseline position, including mineral safeguarding, is set out in Section 2; ecological protection and enhancement in Section 5; water, drainage and nutrient-neutrality measures in Sections 6 and 7; and the detailed mineral safeguarding response in the accompanying Mineral Resource and Mineral Safeguarding appendix.

The proposal responds to the Welsh policy framework for living and working rural communities in ways that reduce environmental impact, support local resilience and strengthen biodiversity.[1][2][3] The emphasis throughout the Management Plan is on practical systems that can be monitored: productive land use, careful resource management, clear performance targets and a review process that allows corrective action if performance falls short.

The Welsh Government declared a Climate Emergency on 29 April 2019, and Wrexham County Borough Council declared a Climate and Ecological Emergency on 25 September 2019 [10][11]. This proposal offers a monitored, measurable household-scale response to that policy context, delivered through the OPD framework rather than through voluntary commitment alone.

Lower Wych is also intended to remain connected to its surrounding community. Road distances from the site entrance are approximately 2.2 miles to the Eglwys Cross Farm bus stop, 2.5 miles to Malpas, 2.8 miles to Tallarn Green Primary School, 6 miles to Whitchurch, 12 miles to Wrexham and 16 miles to Chester. Immediate family support

networks are within 3 miles, and both applicants were raised locally. This locational profile is set out in full in Section 2 (Baseline) and the Transport and Accessibility assessment in Section 11. Community benefit is addressed through local food supply, knowledge-sharing and proportionate public engagement, all subject to the controls set out in the later sections.

The proposal has been shared with nearby landowners ahead of submission, and the initial response received has been positive. Further engagement will continue through the application process and the community measures set out later in the Management Plan.

The Management Plan sets out how the proposal will achieve an initial ecological footprint at or below the 2.4 global hectares per person benchmark, with a clear pathway toward the 1.88 gha/person threshold over time, both as defined in OPD Practice Guidance §1.6 and §1.9, and in Planning Policy Wales §9.3.11 [1][3]. The full Ecological Footprint Analysis is set out in Section 12.

We look forward to working with Wrexham County Borough Council to deliver a robust and well-monitored One Planet Development that contributes to the practical evidence base for sustainable rural development in Wales.

1.3 Essential Criteria Compliance & Objectives

The six essential criteria are the foundation of the proposal. Table 1-1 summarises how the Management Plan addresses each criterion and where the supporting evidence is found.

Table 1-1. Summary of the six essential OPD criteria and the main evidence sections.

Criterion (OPD Practice Guidance § 1.9)	Summary of response	Main sections
1. Light touch on the environment	Retain and strengthen existing hedgerows, woodland and mature trees; create and manage habitat; and apply low-input land management with carefully sited development.	2, 5, 9, 10
2. Land-based and minimum needs met within five years	Productive growing areas, seven integrated land-based enterprises, on-site renewable energy and on-site waste assimilation meeting household minimum needs from the holding, with monitored progress to Year 5.	3, 4, 6, 7, 11, 13
3. Low ecological footprint	Support a compliant initial ecological footprint and a monitored downward trajectory through on-site food production, renewable energy, reduced transport demand and controlled consumption patterns. The EFA is addressed in Section 12.	4, 6, 11, 12, 13
4. Very low carbon buildings	Adopt low-impact construction, efficient fabric, reversible or low-disturbance foundations where appropriate, renewable-led operation and carbon accounting.	3, 6, 8
5. Binding management plan reviewed every five years	Phase implementation, monitor annually, provide a full EFA at years 3 and 5, and review and update the Management Plan at year 5 and every five years thereafter.	12, 13
6. Sole residence of the named occupants	Tie occupation of the dwelling to active management of the holding by a Section 106 agreement (or equivalent legal mechanism), securing the dwelling as the sole residence of the named occupants in compliance with TAN 6 §4.18, and restricting tourist, holiday or separate residential use.	3, 13

In addition to the six essential characteristics, TAN 6 §4.17.4 requires demonstration that the workers must live on the holding (locational necessity). The operational triggers for this requirement — including seasonal livestock welfare, perishable-crop handling windows, fermentation and dairy process supervision, and rapid response to weather and pest events — are set out in Section 4 (with cross-references in Section 5).

The proposal is also organised around the following eleven working objectives, which are carried through the later chapters and the monitoring framework.

1. Land-based financial self-sufficiency: Establish land-based enterprises capable of meeting the household's mini-

mum-income needs by Year 5.

2. **Ecological footprint reduction:** Demonstrate an initial EFA at or below 2.4 gha/person and a clear pathway downward over time, evidenced in Section 12.[1]
3. **Very low carbon buildings and infrastructure:** Provide buildings and associated systems that are low-impact in construction and operation.
4. **Food self-reliance:** Produce the majority of household food needs on site (grown or reared) in accordance with OPD Practice Guidance §3.24–3.26, with the residual proportion (no more than approximately 35%) covered by income from site-based enterprises. Performance baseline: not less than 65% of household food needs produced on site by Year 5, monitored through the Annual Monitoring Reports.[1][2]
5. **Biodiversity and landscape enhancement:** Retain existing ecological assets and deliver measurable habitat improvement through management and creation.
6. **Monitoring and review:** Submit annual monitoring reports on the anniversary of first habitation, with EFA progress reporting each year, a full EFA at years 3 and 5, and a revised Management Plan at year 5.[1] Each annual report will apply defined corrective-action triggers where performance drifts materially from the planned trajectory, with thresholds and remedial actions set out in Section 13.
7. **Community integration:** Contribute positively to the local area through local food supply, knowledge-sharing and proportionate engagement.
8. **Sole-residence compliance:** Ensure the holding remains the sole residence of the named occupants, with occupancy tied to active management of the land through a Section 106 agreement or equivalent legal mechanism.
9. **Waste assimilation and circular resource use:** Minimise imported materials and manage organic and domestic waste on site wherever practicable.
10. **Low-impact transport:** Minimise travel demand, favour active and shared travel where practical, and monitor trips in a form consistent with OPD guidance.
11. **Water supply and natural treatment:** Meet the majority of water needs from site-based sources and treat wastewater on site using an appropriate natural system.

1.4 Purpose of the Management Plan (TAN 6 § 4.15-4.23)

This Management Plan is intended to do more than accompany the application. It defines the proposal in operational terms, sets out the evidence against which it can be assessed, and establishes the monitoring and review structure by which compliance can be judged over time.[1][2]

It therefore serves as:
- the description of how the site will be occupied, used and managed;
- the evidence base for the planning application;
- the basis for ongoing monitoring, corrective action and five-year review; and
- the framework to which any planning condition or legal agreement can relate.

Pre-application advice was obtained under reference ENQ/2024/1056 and this Management Plan responds directly to the matters raised in that process.

Ecological survey work has been undertaken by Arbtech and accompanies the application as supporting evidence. The application relies on the Arbtech Preliminary Ecological Appraisal v2 dated 28 August 2025, COFNOD biological records, follow-up great crested newt eDNA evidence. Supporting evidence on transport, mineral safeguarding and business planning is identified in the relevant chapters and appendices.

In accordance with the OPD Practice Guidance, the first annual monitoring report should be produced 12 months after first habitation and annually on that date thereafter. A full Ecological Footprint Analysis should then be provided in year 3 and again in year 5, accompanied by a revised Management Plan at year 5.[1]

1.5 Planning Policy Framework

The proposal is prepared principally against the following policy framework. Subject-specific chapters address the more detailed local and technical policy requirements.

Table 1-2. Principal policy framework for the introduction.

Policy / guidance	Relevance to this Management Plan
One Planet Development Practice Guidance (2012) [1]	Sets out the structure and required content of the Management Plan, including the essential criteria, EFA and monitoring framework.
Technical Advice Note 6: Planning for Sustainable Rural Communities (2010) [2]	Provides the national planning policy basis for OPD in the open countryside and the core tests for land-based living, monitoring and sole residence.
Planning Policy Wales, Edition 12 (2024) [3]	Provides the wider Welsh planning framework on placemaking, climate response, biodiversity enhancement and sustainable rural development.
Wrexham Unitary Development Plan 1996-2011, adopted 2005 [4]	Following the High Court's quashing of the Wrexham Local Development Plan 2013–2028 in May 2025, the operative development plan for Wrexham comprises Future Wales: The National Plan 2040 together with the residual Wrexham UDP (2005) [5]. This Management Plan is therefore prepared against the national policy framework (PPW 12, TAN 6 and the OPD Practice Guidance) with the UDP as the residual local plan. Relevant UDP policies (including MW1 on mineral safeguarding) are addressed in the topic chapters.
Technical Advice Note 18: Transport (2007) [7]	Informs the transport and accessibility approach and the expectation that travel demand should be minimised.
Well-being of Future Generations (Wales) Act 2015 [8]	Supports the long-term, integrated and preventative approach adopted throughout the proposal.
Environment (Wales) Act 2016 [9]	Informs the approach to biodiversity enhancement, ecosystem resilience and environmental stewardship.
Flintshire County Council Advice Note No. 27: One Planet Development (adopted 17 January 2017) [6]	Cited as persuasive material. As the only adopted OPD-specific guidance by a North Wales local planning authority, AN-27 sets out the supporting information required for OPD applications and is treated by Flintshire as a material planning consideration where no OPD-specific development plan policy exists, a position directly comparable to Wrexham under the current residual UDP framework.

1.6 Document Navigation Map

This Management Plan is arranged so that introductory material is followed by the evidence chapters and then by monitoring and review. Table 1-3 summarises the document structure.

Table 1-3. Document navigation map.

Sections	Content and purpose
Sections 1–2	Introduction, policy context and site baseline.
Sections 3–5	Design strategy, land-based activity, need to live on site, and land management.
Sections 6–8	Energy, water, waste and zero-carbon building strategy.
Sections 9–11	Landscape and visual matters, community impact, and transport and accessibility.
Sections 12–13	Ecological Footprint Analysis, phasing, monitoring, review and exit strategy.
Appendices	Supporting technical evidence, drawings, calculations, surveys and schedules.

This structure is intended to help the Local Planning Authority, consultees and other readers trace each policy requirement to the relevant evidence without unnecessary repetition.

References

[1] Welsh Government. 2012. One Planet Development Practice Guidance: Technical Advice Note 6 - Planning for Sustainable Rural Communities. Cardiff: Welsh Government.

[2] Welsh Government. 2010. Technical Advice Note 6: Planning for Sustainable Rural Communities. Cardiff: Welsh Government.

[3] Welsh Government. 2024. Planning Policy Wales. Edition 12. Cardiff: Welsh Government.

[4] Wrexham County Borough Council. 2005. Wrexham Unitary Development Plan 1996-2011. Adopted 14 February

2005.

[5] Wrexham County Borough Council. 2026. Development Plans and other planning policy: Notice of Withdrawal of the Wrexham County Borough Council Local Development Plan 2013-2028. Updated 18 March 2026.

[6] Flintshire County Council. 2017. Advice Note No. 27: One Planet Development. Mold: Flintshire County Council. Adopted 17 January 2017.

[7] Welsh Government. 2007. Technical Advice Note 18: Transport. Cardiff: Welsh Government.

[8] National Assembly for Wales. 2015. Well-being of Future Generations (Wales) Act 2015 (anaw 2).

[9] National Assembly for Wales. 2016. Environment (Wales) Act 2016 (anaw 3), section 6: Biodiversity and resilience of ecosystems duty.

[10] Welsh Government. 2019. Welsh Government makes climate emergency declaration. Written statement, 29 April 2019.

[11] Wrexham County Borough Council. 2019. Climate and Ecological Emergency declaration and Decarbonisation Plan (Council climate emergency declaration, 25 September 2019).



2.Baseline

2 Baseline

2.1 Location, Area and Boundaries

Lower Wych is a rural site of 5.12 acres / 2.07 hectares at Lower Wych Road, Bronington, Wrexham, Wales, SY14 7JZ, United Kingdom. The registered title is CYM898817 and the actual site area is 20,710 m²; for land-use percentage tables this Management Plan uses a rounded audit basis of 20,700 m². The central OS grid reference is SJ 47903 43889 (SJ479438), equivalent to Easting 347903, Northing 343889; the nearest postcode is SY14 7JZ. Road distances from the site entrance are approximately 2.2 miles to Eglwys Cross Farm bus stop, 2.5 miles to Malpas, 2.8 miles to Tallarn Green Primary School, 6 miles to Whitchurch, 12 miles to Wrexham and 16 miles to Chester. The site is situated within Wrexham County Borough, Wales.[12]

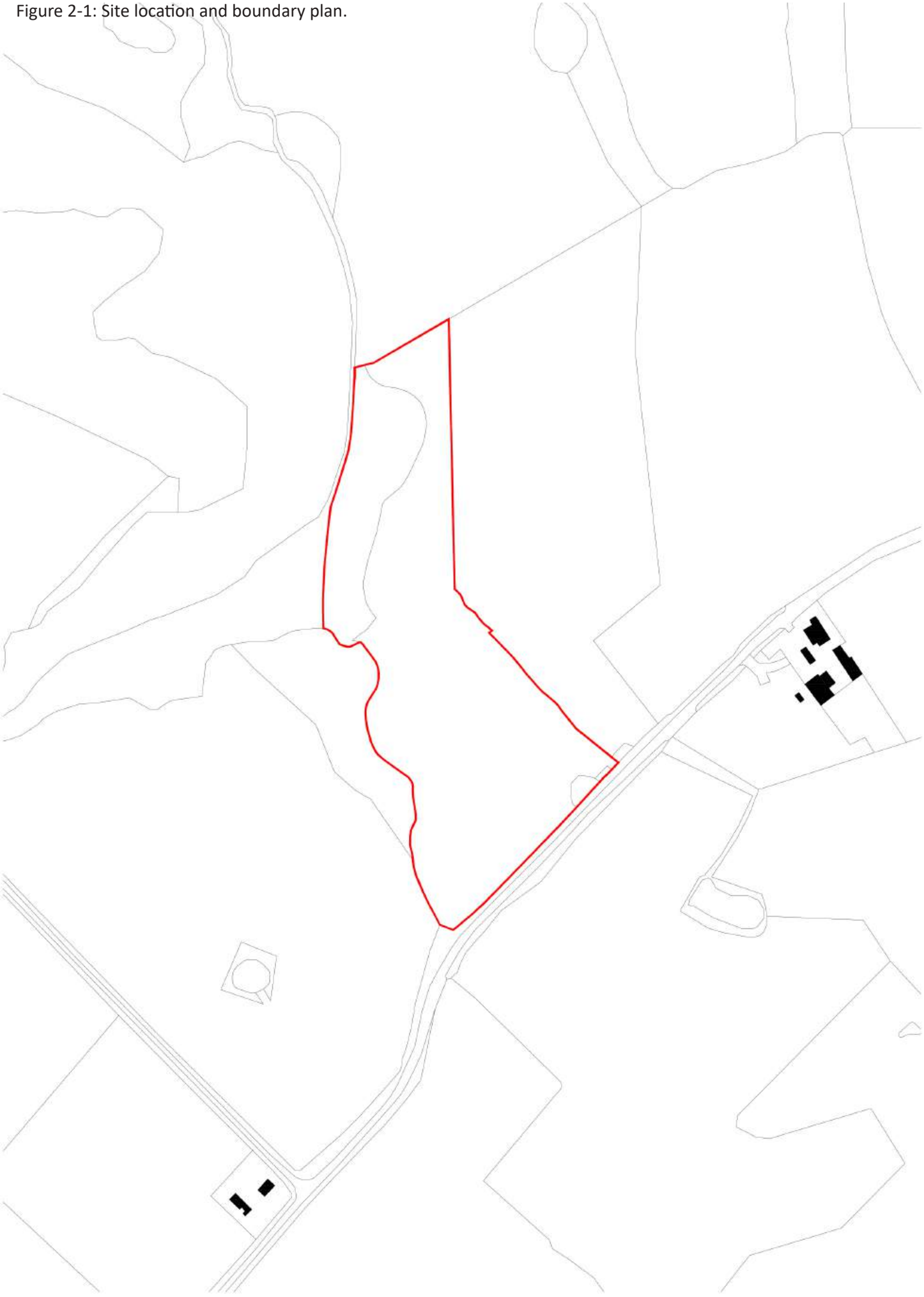
The site is positioned within the gently undulating agricultural landscape characteristic of the Welsh-English borderlands, at around 70-80 metres above sea level. The terrain slopes gently from south to north, providing natural drainage towards the Wych Brook valley system, which forms part of the wider drainage network in this part of the region.

The southern and eastern boundaries are defined for most of their length by a native hedgerow dominated by common hawthorn with abundant blackthorn and occasional bramble. The hedge forms a relatively dense, stock-proof boundary, with one shorter, sparser section along the eastern side where the boundary is partly a post-and-wire fence. The hedgerows provide substantial screening from the rural lane and this network is considered a key landscape feature and is intended to be retained and enhanced as part of the development proposals.

The north-eastern boundary is formed by a stock-proof fence with adjoining pasture beyond. The northern boundary is a short field boundary marked by a combination of woodland edge, low hedgerow and post-and-wire fencing, separating the site from adjacent grazing land. The south-western boundary is defined by native hedgerow with scattered mature oaks, while the north-western boundary follows the edge of the lowland mixed deciduous woodland, marked on the ground by a stock-proof fence.

The site contains approximately 0.95 acres (0.38 hectares) of existing lowland mixed deciduous woodland on the north-western / northern edge of the holding. The Arbtech PEA v2 describes the canopy as dominated by common sycamore, with abundant common oak, frequent common hazel, occasional common hawthorn and rare silver birch; the woodland includes mature, semi-mature and young trees, natural regeneration and areas of deadwood, and is assessed as being in good condition. This woodland area represents around 19% of the total site area and is intended to be retained in its entirety and managed positively as part of the biodiversity enhancement strategy for the development.

Figure 2-1: Site location and boundary plan.



2.2 Context / Adjacent Land Uses

The site lies within a predominantly agricultural landscape typical of the Welsh-English borderlands, where traditional mixed farming has shaped the countryside over many centuries. The immediate context is a mosaic of small to medium-sized fields bounded by mature hedgerows, combining pastoral land with a small amount of arable use.

To the east, the landscape comprises a series of small to medium-sized pastoral fields used primarily for sheep or cattle grazing and enclosed by mixed native hedgerows with scattered mature trees. The field pattern reflects historic enclosure and contributes to the characteristic irregular, hedged landscape.

To the south, agricultural land is managed as improved grassland for grazing, with further pastoral fields, small woodland copses and mature hedgerow trees in the wider area. Management appears relatively extensive, with stock moved between fields to maintain sward quality.[13]

To the west, the pattern of small to medium-sized fields continues, supporting a mix of improved and semi-improved grassland, scattered mature trees and hedgerows.

To the north, the site's boundary is defined by lowland mixed deciduous woodland within the holding; beyond this, further grazing fields and larger woodland blocks follow the Wych Brook corridor, reinforcing the enclosed, rural character of the landscape.

2.3 Tenure

[redacted]

The land registry title (CYM898817) confirms the applicants' ownership of the entire 5.12-acre site, with no encumbrances or restrictions that would prevent the proposed development. There are no public rights of way across the land, and vehicular access connects directly to the public highway via the existing gateway described in Section 2.4.[14]

2.4 Existing On-Site Services and Access

The land has historically functioned as agricultural pasture and, in keeping with this, there are no existing mains utility connections within the site: no mains water supply, electricity, gas or sewerage infrastructure currently serves the holding. This absence of existing utilities is typical for agricultural land in this area.

The nearest mains electricity infrastructure comprises overhead power lines serving neighbouring properties in the immediate vicinity of the site. The intention is that the proposed development will meet all of its energy requirements through on-site renewable generation (principally solar photovoltaic panels with battery storage).

Mains water is available in the local road network serving scattered dwellings in the Lower Wych area. In line with One Planet Development principles, the proposal is to rely primarily on rainwater harvesting.

Telecommunications infrastructure runs along the local road network, and nearby properties have access to fixed-line broadband. Initial checks indicate good mobile coverage from the main network operators.

The site has no existing foul drainage or sewerage infrastructure, with the nearest mains sewer located over 2 miles away in the direction of Malpas. The site drains within the wider Wych Brook / River Dee catchment, so foul drainage, greywater treatment, surface-water management and nutrient pathways are treated as key design considerations. The proposed source-separated sanitation, greywater treatment, rainwater harvesting and nutrient-management strategy are set out in Sections 6 and 7.

Vehicle access to the site is currently achieved via an existing gateway that connects directly to the public highway. The proposal retains this access and provides visibility splays of 2.4 m x 120 m, as shown on the existing and proposed site plans. The splays fall within the existing adopted highway verge / grass verge and do not require hedgerow removal. The access surface will be improved using permeable materials, with detailed access, parking, visibility and trip-generation matters assessed in the Transport section of this plan.

Parking for the proposed development will be provided within the curtilage of the dwelling, using permeable surfacing materials that integrate with the landscape setting. The access and parking arrangements will be designed to minimise visual impact while providing adequate space for vehicles.

2.5 Physical Geography, Soil and Climate

2.5.1 Geology and landform

The geological landscape of the Lower Wych area forms part of the Welsh Borderlands, a zone of lowland hills and valleys shaped mainly by glacial and river processes. LANDMAP classifies the application fields as a lowland glacial and fluvioglacial depositional terrain, specifically a lowland till plain / field, where superficial deposits rather than exposed bedrock largely control the landform.[15][16][17]

The dominant superficial deposits are glacial clays and boulder clay/till, with minor glacial or fluvioglacial sand and gravel forming a subdued terrace. To the north, the Wych Brook and its tributaries have incised this terrace, creating a more irregular, hummocky valley-side with small areas of floodplain alluvium beside the stream.[16][17]

2.5.2 Soils and agricultural land classification

Soils appear generally loamy and moderately well-drained, supporting permanent pasture with occasional wetter patches in slight hollows.[16][17][13]

The Welsh Government Predictive Agricultural Land Classification (ALC) Map 2 identifies the site as a mixture of Grade 3a and Grade 3b agricultural land. Grade 3a is classed as “best and most versatile” (BMV) agricultural land, while Grade 3b is not.[18]

The proposal does not remove the land from agricultural or land-based productive use. The One Planet Development would retain and intensify productive use of the holding through horticulture, orchard, meadow, coppice, woodland management and associated land-based enterprises. The implications of the predicted Grade 3a land are therefore addressed in Section 3 (Design and Development Strategy), Section 4 (Business and Improvement Plan) and Section 5 (Land Management).

The site occupies a gentle slope, falling from around 83m at the southern edge to around 75m near the northern boundary, creating a modest northward fall towards the Wych Brook catchment. This topography provides natural drainage, some shelter from prevailing south-westerly winds and good solar exposure for productive growing areas and small-scale renewable energy systems.

2.5.3 Soil analysis (RHS)

A soil analysis was undertaken by the Royal Horticultural Society (RHS) Soil Analysis Service (Sample Name: FIELD 1; date received 18 November 2025; date reported 26 November 2025) to provide baseline information on soil texture, pH, organic matter and key macronutrients relevant to fruit and vegetable production.[19]

Table 2-1: RHS Soil Analysis Results (Field 1)

Parameter	Result	RHS interpretation
Soil texture	Clay loam	
Organic matter	6.2 %	Medium
Soil pH	6.5	
Available phosphorus (P)	33.2 mg/l	Index 3 (Medium)
Available potassium (K)	110 mg/l	Index 1 (Low)
Available magnesium (Mg)	108 mg/l	Index 3 (Medium)

Overall, the results indicate a moderately fertile clay loam with a pH appropriate for most fruit and vegetable crops. The principal nutrient constraint is low available potassium (Index 1), which will inform future cultivation and soil-building measures. The RHS report advises that lime is not required at pH 6.5 and recommends ongoing additions of organic matter (e.g. well-rotted compost or manure) to support soil structure and fertility.[19]

The report also notes that repeat testing within approximately two years would help to confirm that soil pH remains suitable for vegetable cultivation.[19]

2.5.4 Climate and microclimate

Climate data for the Lower Wych area, based on Met Office records from the Shawbury weather station (the nearest long-record station, approximately 15 miles away), indicate a temperate oceanic climate typical of the Welsh-English borderlands. The long-term (1991-2020) mean annual rainfall at Shawbury is around 680 mm, spread fairly evenly through the year with slightly higher totals in autumn and winter and slightly lower totals in spring and early summer.

Using the same station data, the period 1994-2024 shows an estimated mean annual rainfall of around 740 mm/year, and the most recent decade (2015-2024) has been noticeably wetter still, with a 10-year mean of about 855 mm/year (roughly 25% higher than the 1991-2020 norm) and several notably wet years (for example, approximately 960 mm in 2020, 915 mm in 2022, and 960 mm in 2024, with one exceptionally wet year exceeding 1,500 mm in 2021). This pattern indicates a generally wet climate, with recent decades tending towards above-average rainfall, providing a strong basis for the proposed reliance on rainwater harvesting.[20]

Average temperatures are moderate, with mean daily maximum and minimum of around 7-8°C / 1-2°C in January and 21-22°C / 11-12°C in July. On this basis, the practical growing season typically extends from late March or early April through to late October, providing a relatively long window for grass growth and horticultural production.

Wind patterns are dominated by south-westerly airflow, bringing mild, moist air from the Atlantic. Mean wind speeds are generally moderate, with stronger winds more common in the winter months. The site's position on a gentle slope, enclosed by hedgerows and woodland, provides some shelter from prevailing winds while maintaining sufficient air movement to reduce frost hollows and humidity-related plant disease risk.

Climate change projections for the region, based on UK Climate Projections 2018 (UKCP18), indicate a trend towards warmer, drier summers and milder, wetter winters, with increased rainfall intensity in winter and a higher likelihood of short summer droughts. These changes underline the importance of rainwater harvesting, soil organic matter, shade/shelter and diverse cropping in the proposed land management plan, so that the holding remains resilient under both wetter and drier future conditions.[21]

2.5.5 Radon

A check of the UKHSA/BGS radon potential mapping shows that the site lies within the lowest radon potential band, where less than 1% of homes are estimated to be at or above the Action Level. Radon is therefore not identified as a significant baseline constraint. Any Building Regulations requirements for radon protection will be confirmed at detailed design stage in accordance with the relevant UKHSA/BGS and BR 211 guidance.[46][47]

2.5.6 Air quality and noise

The site is in a rural location, away from strategic roads, industrial premises and dense urban sources of emissions. Published Air Quality in Wales / Local Air Quality Management information does not identify an Air Quality Management Area affecting the site. Baseline air quality is therefore not identified as a significant constraint for the proposed One Planet Development.[49]

The existing noise environment is rural and is expected to be dominated by occasional local traffic, agricultural activity, birdsong, wind and weather. There are no major roads, railway lines or industrial premises adjoining the application site. Noise is therefore not identified as a significant baseline constraint; any temporary construction noise and operational activity will be managed through the low-impact construction and site-management measures set out in later sections of this plan.

2.5.7 Hydrology and flood risk

Natural Resources Wales flood-risk mapping shows that the proposed development area lies outside all mapped fluvial (river) and tidal flood zones and outside recorded flood extents. A narrow strip along the western boundary of the wider holding is identified as having low risk of flooding from surface water and small watercourses, associated with local overland flow paths, but this area lies well away from the proposed buildings and main access track. Surface water management will nonetheless be designed to ensure that run-off is controlled and that the small low-risk area on the western boundary is not adversely affected.[22][23]

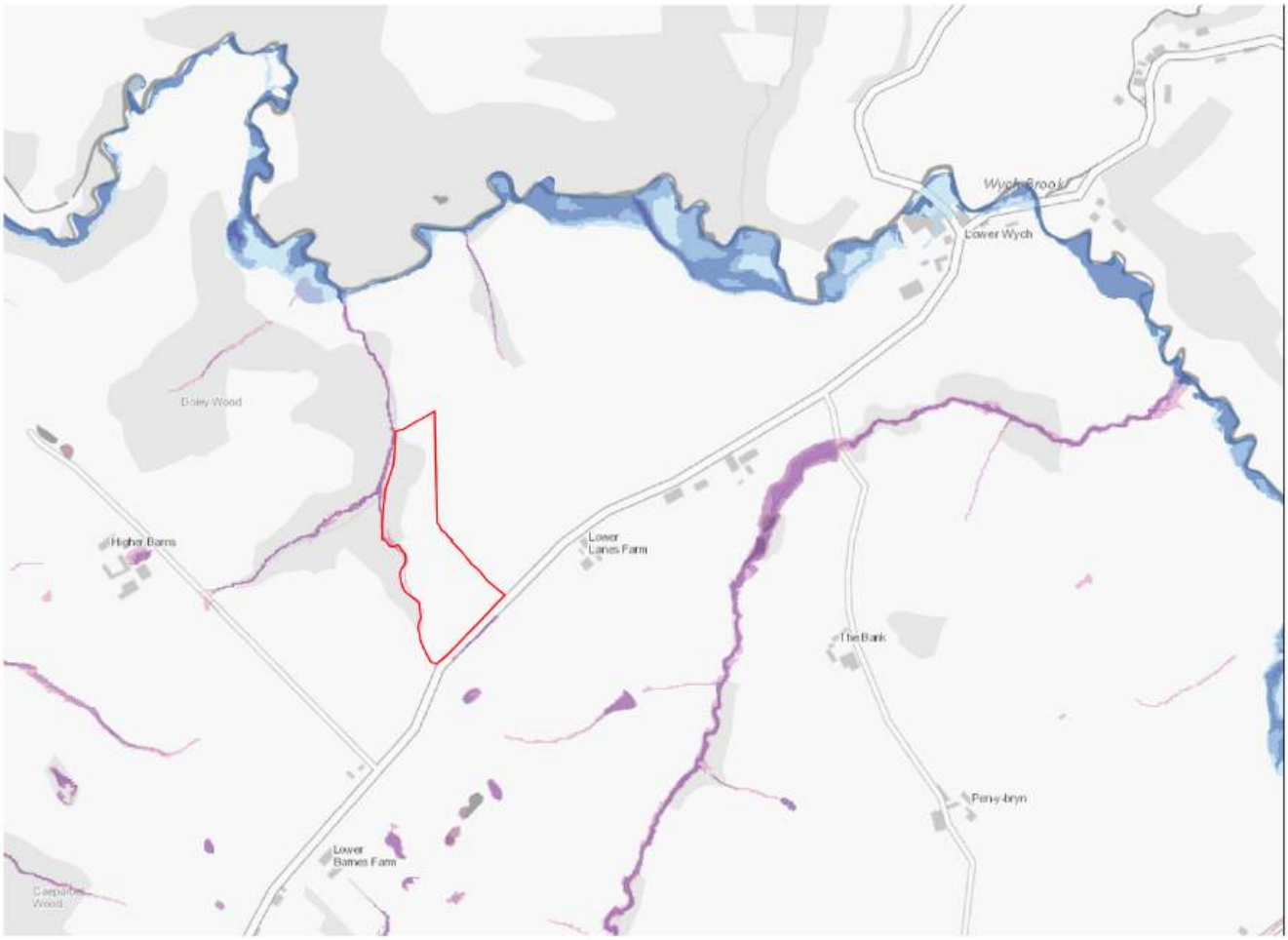
2.6 Ecology and Biodiversity

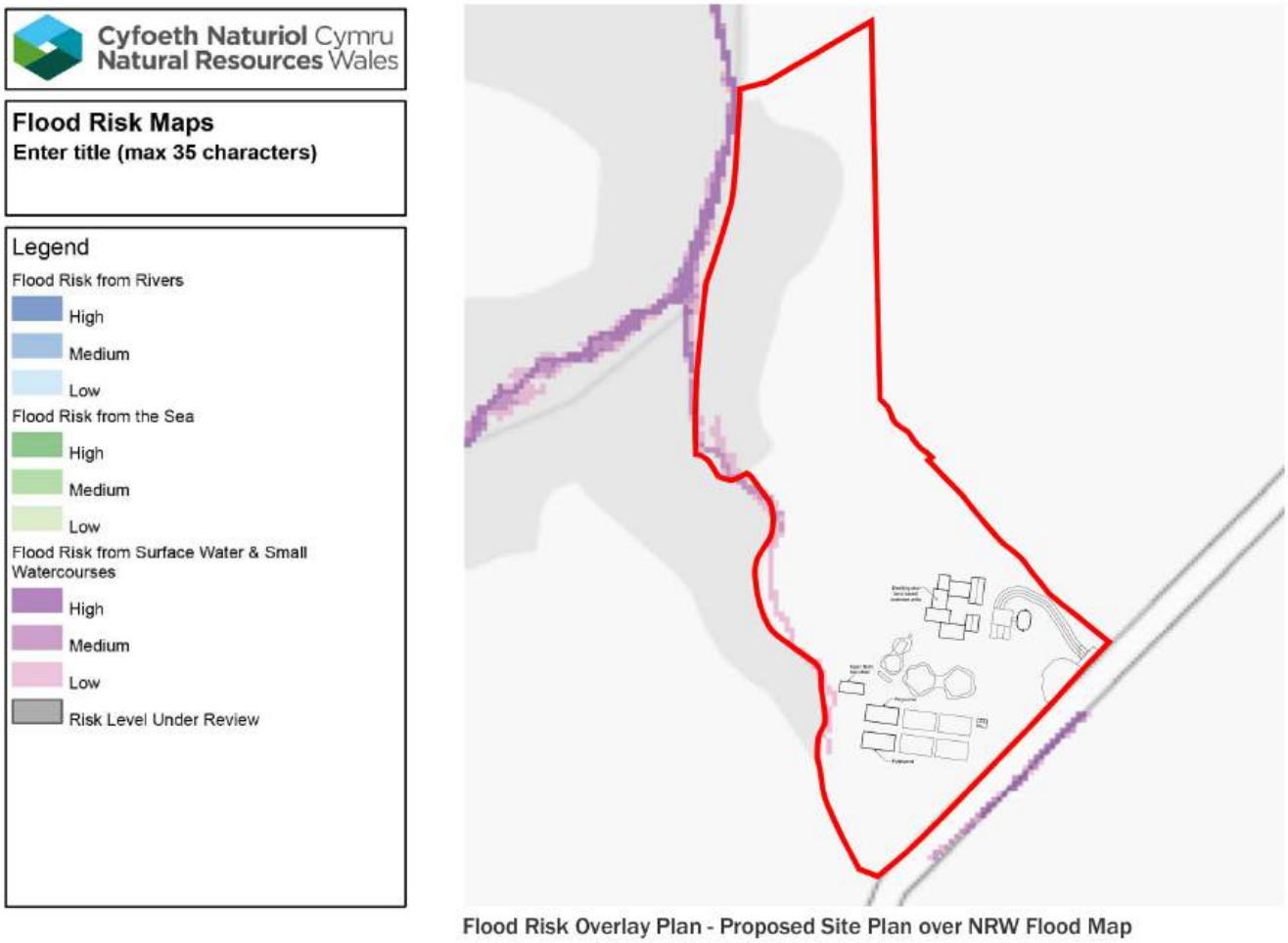
2.6.1 Biodiversity of the Wider Area

The Lower Wych site lies within the Hanmer Grassland Landscape Habitats aspect area (WRXHMLH055) in the LANDMAP dataset. This area forms the Welsh part of the Shropshire and Cheshire Meres and is characterised by gently undulating farmland with small fields bounded by hedges, scattered trees, numerous ponds, and patches of semi-natural broadleaved woodland and wet grassland. Mixed agricultural use (mainly grassland with some arable) has, over many centuries, created a patchwork of improved and semi-improved grasslands, arable fields, hedgerows, small woods and wetland features.[15][24]

LANDMAP assigns this aspect area an overall High habitat and species evaluation, reflecting the extent and variety of

Figure 2-2: Flood risk map.





Flood Risk Overlay Plan - Proposed Site Plan over NRW Flood Map

wet habitats.[15]

The site lies within Wrexham County Borough and within buffer zones associated with several internationally or nationally designated nature conservation sites, although it is not located within those statutory designations:

- Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC / SSSI, designated for lowland raised bog habitats of international importance;[25]
- Whixall Moss SSSI, forming part of the same peatland complex;[25][13]
- River Dee SAC, designated for river habitats and migratory fish species. These sites are located some distance from Lower Wych and are separated from the application land by intervening farmland, woodland and settlements; the holding does not form part of these statutory designations but lies within their wider environmental context.

Ecological connectivity in the wider landscape is provided primarily by the Wych Brook valley, approximately 400 m to the north of the site, together with the high density of ponds, hedgerows and small woodland blocks typical of the Hanmer Grassland aspect area. The brook corridor supports riparian habitats and links scattered areas of woodland, hedgerows and ponds. At the local scale, biodiversity interest on and around the application site is focused on linear features such as hedgerows and streams, scattered mature trees, ponds and the adjacent woodland, which together provide movement routes and foraging habitat for common wildlife and locally notable species.[24]

In the non-statutory context, the updated Arbtech Preliminary Ecological Appraisal v2, incorporating COFNOD records, identifies Doley Wood and Meadows Local Wildlife Site in relation to the holding. The holding, including the proposed dwelling, access, productive growing areas and water-management features, lies outside the Local Wildlife Site but is adjacent to it. This woodland designation is treated as a key ecological constraint and enhancement opportunity in Section 5.

2.6.2 Site-Specific Ecology (Preliminary Ecological Appraisal)

A Preliminary Ecological Appraisal (PEA) was undertaken by Arbtech Consulting Ltd, following a site survey on 31 July 2025, and reported as PEA v2 dated 28 August 2025, incorporating COFNOD biological records. The PEA assessed habitats and species within the application site and relevant wider ecological context. The report provides the ecological baseline and recommendations; the full OPD response is carried through the Green Infrastructure Statement, CEMP, low-impact lighting strategy and avoidance-led GCN RAMS.[13]

The main habitats recorded were:

- Other neutral grassland (c. 4 acres) forming the majority of the site. This is grazed pasture dominated by species such as perennial rye-grass and white clover with common associates, and is assessed as being of low ecological value.
- Lowland mixed deciduous woodland (c. 0.95 acres / 3,829 m²) along the north-western / northern edge of the site, with dominant common sycamore, abundant common oak, frequent common hazel, occasional common hawthorn and rare silver birch recorded by the Arbtech PEA. The PEA assessed this woodland as Good condition (34 points). It is the highest-value habitat within the holding.
- Native hedgerow along the southern and eastern boundaries, dominated by common hawthorn with abundant blackthorn and occasional bramble, with one shorter, sparser section on the eastern boundary.
- Scattered trees within the grassland, including mature oaks, hawthorn and semi-mature oaks (T1-T16), which contribute to landscape character and provide additional habitat structure. The Arbtech PEA records mature oaks at T1, T2, T12, T13 and T14; hawthorn at T3 to T11; and semi-mature oaks at T15 and T16.
- A small pond (P1) to the south of the site, assessed by the PEA as poor habitat condition but with excellent Habitat Suitability Index suitability for great crested newt.
- Localised areas of bramble scrub and built linear features (the access track and fencing).

In terms of fauna, the PEA identifies general potential for protected and priority species associated with these habitats, including:[13]

- nesting and foraging birds in hedgerows, woodland and scattered trees;
- commuting and foraging bats along hedgerows, tree lines and woodland edges;
- amphibians, including great crested newt associated with P1 and the wider pond network;
- small mammals and other species using hedgerows, woodland and field margins (including a mammal hole that will require pre-works checks).

The PEA concluded that the site overall is of moderate ecological value, dominated by semi-improved / other neutral

grassland of limited botanical interest, with hedgerows, P1 and the retained north-western / northern woodland parcel representing the relatively more valuable features. Follow-up eDNA evidence confirms great crested newt presence in P1 and P5, with P2 / relevant wider pond context treated on an assumed-presence basis where access was not secured. The application therefore proceeds on an avoidance-led basis, using the Green Infrastructure Statement, CEMP / pollution prevention, low-impact lighting strategy, precautionary working methods and GCN RAMS. The full technical ecology report is provided as supporting evidence; its recommendations and implications for management are addressed in Section 3 (Design and Development Strategy) and Section 5 (Land Management).[13]

2.7 Cultural Heritage

The holding lies within Maelor Saesneg ("English Maelor"), the part of historic Flintshire south-east of the River Dee (formerly Flintshire Detached), now within Wrexham County Borough. This area forms the Welsh side of the North Shropshire / South Cheshire plain, and is described in historic-landscape work as a rural lowland with undulating farmland, irregular hedged fields and dispersed farms.[13][27]

Within LANDMAP's Historic Landscape layer the site lies in the Iscoyd aspect / character area, described as an agricultural rural environment of irregular fieldscapes: undulating lowland with predominantly irregular fields defined by ancient hedges (with some modern fencing), narrow sinuous strips of broadleaved woodland along steep-sided stream valleys, dispersed farms of medieval/post-medieval origin, an 18th-century country house and park at Iscoyd Park, ponds (often former marl-pits), prehistoric burial mounds, a moated site and relict ridge-and-furrow. The historic landscape here is assessed as having good integrity and overall moderate value at the county scale.[15][28]

2.7.1 Salt-working and the "Wych" name[26]

In this border region, place-names ending in "-wych/-wich" are closely associated with salt and brine springs. CPAT's historic-landscape and industrial-landscape assessments for Maelor Saesneg record that Upper and Lower Wych Salt Works were operating in the early 19th century, with a brine pit about 7 metres in diameter still visible at Lower Wych. CPAT also records an 18th-century antiquarian reference by Thomas Pennant to a brine spring and salt works near Sarn Bridge over the Wych Brook. Together, this evidence confirms a long-standing association between the Wych Brook valley, immediately north of the site, and small-scale salt production, linking Lower Wych to the wider Cheshire / border salt-working tradition.[27]

2.7.2 Field pattern and on-site features

Within the application boundary there are no recorded or designated heritage assets. However, the site's boundaries are formed by hedgerows and woodland edges that correspond to historic field lines shown on 19th-century mapping and are typical of the irregular fieldscape described in the Iscoyd characterisation. These hedgerows have been maintained largely by periodic cutting rather than traditional hedge-laying, and many are now somewhat over-mature; there is clear scope for restorative hedge-laying and coppice management to reinforce both their cultural and ecological value, which is picked up in the Green Infrastructure Management Plan.[28]

The adjacent lowland mixed deciduous woodland to the north forms part of the narrow, sinuous woodland strips that follow the incised stream valleys characteristic of this historic landscape. [28]

2.7.3 Designated heritage assets in the wider landscape

Several designated heritage assets lie within the wider setting of the site, but none lies within the red-line boundary:

- Castle Hill motte and ditch system, Oldcastle (Scheduled Monument, Historic England List Entry 1012124), located on a spur above the Wych Brook on the English side of the valley. Castle Hill comprises the earthwork and buried remains of a small medieval motte with surrounding ditches. Intervening topography and woodland mean there is no intervisibility between the Scheduled Monument and the application site.[29]
- Iscoyd Park (House, Grade II*, with associated listed structures), representing an 18th-century brick country house and designed landscape which is a key element of the Maelor Saesneg historic landscape. These assets are located some distance from the site and are visually separated by intervening farmland and tree cover. [28][27][30]
- Lower Wych Bridge (Grade II), a listed bridge carrying the lane across the Wych Brook on the Wales-England boundary, underlining the valley's historic function as a crossing and parish boundary.[31]

Given the distance, scale, low height and enclosed siting of the proposed One Planet Development, and the retention of existing woodland and hedgerows, no effects on the setting of these designated assets are anticipated.

2.7.4 Cultural continuity and the proposed development

The cultural significance of Maelor Saesneg extends beyond individual monuments to the working rural landscape itself: mixed farming, hedge-laying, coppicing, the use of small woods, ponds and irregular fields, and long-term grazing regimes that have shaped the area over centuries.[27]

The proposed One Planet Development is designed to work with and reinforce this cultural landscape by:

- retaining the historic field pattern, woodland edge and hedgerow network;
- restoring more traditional boundary management (hedge-laying and cyclical coppicing where appropriate);
- maintaining a small-scale, mixed, land-based livelihood; and
- using low-impact building forms and materials that sit quietly within the existing farmed setting.

In doing so, the project aims to add a new, low-impact chapter to the long history of land use at Lower Wych, consistent with the historic and cultural character identified in LANDMAP and the Maelor Saesneg historic-landscape assessments.[15][27]

2.8 Existing Buildings and Structures

There are no existing buildings or structures present on site.

2.9 Landscape Features

2.9.1 Broad landscape context

The Lower Wych holding lies in the lowland border landscape of Maelor Saesneg on the transition between gently rolling farmland and the more enclosed valley of the Wych Brook.[27]

According to the LANDMAP Visual & Sensory dataset, the application fields fall within the “Maelor - Open Rolling Lowland” aspect area (WRXHMVS040). This is described as an “attractive archetypal rolling farming landscape” with elements of estate farming and “a pleasant mix of small to medium field patterns and woodland blocks and copses.” Main land use is agriculture (predominantly pasture with some arable), with mature hedges and frequent hedgerow trees (often oaks) and a network of narrow lanes. The area is evaluated as Moderate overall, but with High scenic quality and High integrity.[15][32]

Immediately to the north, the land falls into the “Wych Valley - Wooded Lowland Valleys” Visual & Sensory aspect (WRXHMVS048). This is characterised as a narrow, winding, well-wooded valley where mature mixed deciduous woodland clings to the steep valley sides, enclosing the Wych Brook and creating an intimate, secluded character. Scenic quality and integrity are both assessed as High, reflecting the strongly enclosed, picturesque valley-side woodland and the relative absence of intrusive development.[32]

Taken together, these aspect areas define a transitional landscape: open rolling farmland on the terrace tops, grading into a more enclosed wooded valley along the Wych Brook. The application site sits on the gently north-facing terrace above the valley, reading as a typical small field unit within the wider Maelor rolling farmland.

Field pattern in the surrounding area is small to medium-scale and irregular, with fields generally a few acres in size, reflecting piecemeal historic enclosure. Boundaries are predominantly hedgerows, many with hedgerow oaks and other mature trees, interspersed with short sections of post-and-wire fencing where hedges have become gappy or have been replaced. Built development is sparse and dispersed: individual farmsteads, small clusters of dwellings along lanes and small hamlets such as Lower Wych, Higher Wych and Whitewell. Buildings are typically brick, sandstone or rendered cottages and farmhouses under slate or tile, sitting low in the landform and visually subordinate to fields, trees and hedges.

2.9.2 Site-specific landscape features

Within this broader context, the application site is a small, typical parcel of rolling farmland on the terrace edge above the Wych Brook valley. The principal features, drawing on the Preliminary Ecological Appraisal and survey work, are:[13]

Semi-improved neutral grassland (~4 acres) forming the main field, used as grazed pasture and dominated by perennial rye-grass and white clover with common associates.

Lowland mixed deciduous woodland (~0.95 acres) on the north-western / northern edge of the site, comprising

native broadleaves including oak, ash, birch and hazel with an understorey largely of bramble and nettle. This woodland forms the immediate transition towards the more densely wooded Wych Valley and the wider Doley Wood and Meadows Local Wildlife Site corridor.

Native hedgerows along the southern and eastern boundaries, dominated by common hawthorn with abundant blackthorn and occasional bramble, with scattered hedgerow trees (including several mature oaks and hawthorns) contributing to the characteristic "hedged field with trees" pattern of the Maelor landscape.

A small pond (P1) to the south of the site, providing local variation in micro-topography and vegetation and tying into the wider Hanmer/meres landscape in which ponds are a common feature.

Localised scrub and built linear features and lengths of stock-proof fencing, consistent with the working agricultural character of the holding.

There are no public rights of way crossing the site, and public views into the land are correspondingly limited. From the adjacent lane, the site is largely screened by the eastern hedgerow and woodland edge, with only short, filtered views available through the gateway. [14]

A fuller analysis of visual receptors, representative viewpoints and likely visual effects of the proposed development is provided in Section 9 (Landscape and Visual Impact). Overall, the site reads as an intact, typical component of the rolling lowland landscape, with existing hedgerows, trees, woodland and the pond providing a strong structural framework within which low-impact development and landscape enhancement can be successfully accommodated.

2.10 Past and Present Land Use

The land-use history of the Lower Wych site reflects the wider agricultural development of Maelor Saesneg ("English Maelor"), where mixed farming and pastoral systems have evolved over many centuries to create the present pattern of small fields, hedgerows and dispersed farmsteads. The proposed One Planet Development is intended to sit within this tradition, rather than introduce a completely new form of land use.[27]

2.10.1 Historic land use patterns

Historic landscape work by the Clwyd-Powys Archaeological Trust (CPAT) shows that Maelor Saesneg has been a farmed landscape since at least the medieval period, characterised by:[28][27]

- irregular enclosed fields of medieval and later date;
- scattered farms and small roadside settlements; and
- later estate improvements, such as country houses and parkland, layered onto this older field pattern.

Late 19th- and early 20th-century Ordnance Survey maps show very little change to the basic field structure: the boundaries that now define the application site are already in place. The woodland occupying the north-western / northern edge of the site is present on all mapping from the 19th century onwards, indicating that it has been a stable landscape feature for at least 150 years.[12]

2.10.2 20th-century agricultural change

Across Maelor Saesneg, the 20th century brought mechanisation, artificial fertilisers, improved grass cultivars and land drainage, increasing productivity but also simplifying some parts of the landscape. CPAT's agricultural assessment notes that the predominant land use today is largely pastoral, and the irregular field pattern and dispersed farms remain a defining characteristic.[27]

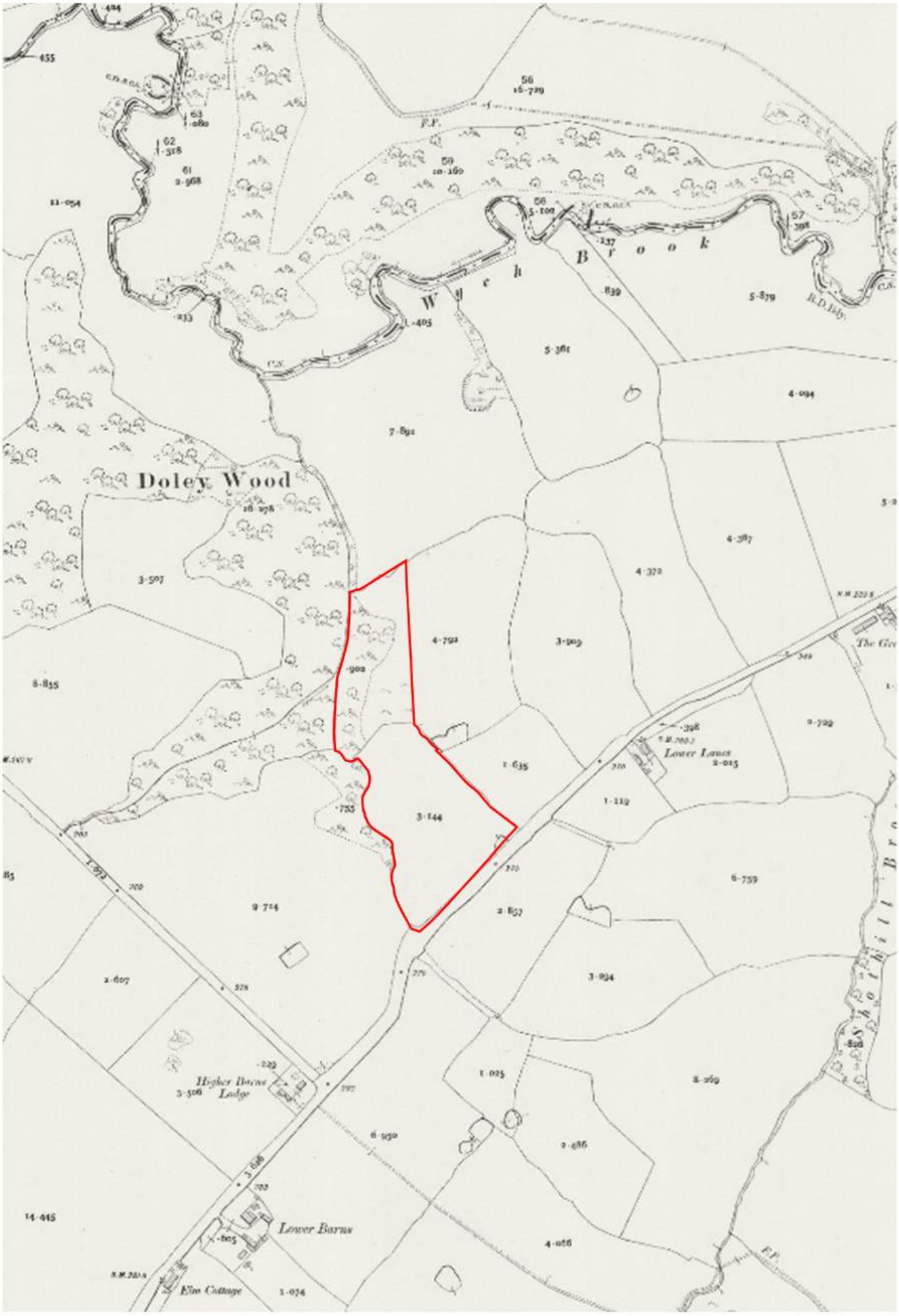
Aerial photography and mapping for the Lower Wych holding from the mid-20th century onwards show the application fields remaining in agricultural use, with the same broad pattern of one larger pasture field and a small woodland block on the north-western / northern edge. There is no indication of large-scale boundary removal or conversion to intensive arable.

2.10.3 Recent land management (c. 1990-2022)

Local information indicates that, during the late 20th and early 21st centuries, the application fields formed part of a mixed farming unit, managed primarily for grazing livestock. The land appears to have been used extensively for sheep and cattle grazing. [13]

Under this regime, the sward developed as semi-improved grassland, intermediate between intensively improved

Figure 2-3: 1909 Ordnance Survey map showing the historic field pattern at Lower Wych



rye-grass leys and very species-poor pasture, with some native grasses and forbs persisting. This is consistent with the Preliminary Ecological Appraisal, which records the main field as “other neutral grassland” of low ecological value rather than highly improved monoculture pasture.[13]

The woodland on the north-western / northern edge of the site appears to have been largely unmanaged in recent decades. There is no evidence of systematic coppice cycles, thinning or understorey management. Instead, natural regeneration and the accumulation of deadwood have produced a mixed-age stand with a relatively simple understorey dominated by bramble and nettle. [13]

The current land use provides a sound baseline with the existing pastoral character and generally modest ecological value, offering opportunities for enhancement through the implementation of sustainable land management practices that will support both agricultural production and biodiversity conservation. The site’s history of continuous agricultural use demonstrates its suitability for productive land use and provides a solid foundation for the more intensive and diverse agricultural activities proposed as part of the One Planet Development.

2.11 Statutory Designations

The site is located within the administrative boundary of Wrexham County Borough. It is not itself within any internationally or nationally designated nature conservation area, and it is not covered by heritage designations such as scheduled monuments or registered parks and gardens. The updated Arbtech PEA v2, incorporating COFNOD records, identifies Doley Wood and Meadows Local Wildlife Site as found near the site. [13]

Following the High Court order of 19 May 2025 quashing the Wrexham Local Development Plan, and the subsequent Welsh Ministers’ withdrawal direction dated 18 March 2026, the development plan for Wrexham now comprises Future Wales: The National Plan 2040 and the Wrexham Unitary Development Plan 1996-2011 (adopted 2005), in order of legal hierarchy.[48]

The baseline constraints identified in this section are therefore considered against the operative UDP framework, including relevant residual policies such as PS1, PS2, GDP1 and EC1-EC6, together with national planning policy and OPD-specific policy. These site characteristics also inform the One Planet Development assessment under TAN 6 §4.17-4.22 and the detailed design, land-based activity, land-management, energy, water, waste, landscape and transport sections that follow.

In terms of statutory nature conservation designations, the site lies in the wider environs of the Fenn’s, Whixall, Bettisfield, Wem and Cadney Mosses Special Area of Conservation (SAC) and the adjacent Whixall Moss Site of Special Scientific Interest (SSSI), which straddle the Wales-England border, as well as the River Dee SAC designated for important riverine habitats and migratory fish. Because the site falls outside the boundaries of these statutory designations, there are no direct statutory protected-site constraints on the application land, though proximity to sensitive sites means that potential indirect effects on hydrology, drainage, habitat connectivity and water quality are considered in the design and management of the development.[25][26]

There are no Special Protection Areas (SPAs) covering the land, and the site is not within a Conservation Area, an Area of Outstanding Natural Beauty, or any local landscape designation such as a Special Landscape Area. The land does not lie within a Registered Historic Landscape under the Register of Landscapes of Historic Interest in Wales, nor within a Ramsar site, and there is no Site of Special Scientific Interest (SSSI) covering the fields. Within the site boundary there are no listed buildings, no registered battlefields and no other heritage designations such as scheduled monuments. [28][29]

In summary, the holding is free from direct international and national statutory nature-conservation designations, but a section of the site lies adjacent to the Doley Wood and Meadows Local Wildlife Site. This relates specifically to the retained lowland mixed deciduous woodland on the north-western / northern edge of the holding, which extends beyond the site boundary into adjacent land. No direct loss of the LWS is proposed. Construction, drainage, lighting and land-management measures will avoid pollution, root damage, surface-water impacts, dust, material storage and light spill affecting the LWS and adjacent woodland-edge habitat.

2.12 Transport

See Section 11 for baseline transport data.

The Transport and Accessibility baseline section of the One Planet Development (OPD) Management Plan outlines the current transport situation and infrastructure surrounding Lower Wych. This baseline establishes the foundation for the OPD transport strategy, demonstrating the site’s connectivity and current travel patterns in alignment with

the One Planet Development principles.

2.12.1 Site Location and Regional Connectivity[12]

Lower Wych is situated in a rural setting with good local and regional transport links, making it well connected for daily living while preserving its quiet, low-impact environment. The proximity of essential services, public transport links, and the overall transport infrastructure forms the foundation for a low-carbon transport strategy.

- **Local Services:** The proposed OPD is positioned 2.5 miles from Malpas, which offers a supermarket, doctor's surgery, dentist, pubs and other community amenities. Tallarn Green Primary School is approximately 2.8 miles away. The Eglwys Cross Farm bus stop is approximately 2.2 miles from the site entrance. These distances support a practical pattern of local services, school access, bus access, trip-chaining and limited vehicle use.
- **Access to Larger Towns:** Whitchurch is approximately 6 miles away by road and provides further services including a railway station, retail, schools and medical services. Wrexham is approximately 12 miles away and Chester approximately 16 miles away. Other nearby settlements and local service centres include Penley at approximately 6 miles, Bangor-on-Dee at approximately 8 miles, Overton at approximately 9 miles and Ellesmere at approximately 10 miles. These are road-distance figures and should be used consistently across the Management Plan and supporting appendices.
- **Wrexham and Regional Connectivity:** Wrexham, located 12 miles from the site, offers more extensive services, including medical facilities, large supermarkets, and national rail connections. Wrexham provides direct links to towns across Wales and the UK.[33]

2.12.2 Traffic Flow and Road Capacity

The transport baseline is informed by the current state of traffic conditions on the lane that serves Lower Wych. Traffic data sourced from the Department for Transport (DfT) confirms that the road is well-suited to the One Planet Development approach, with minimal traffic flow and ample capacity to accommodate additional movements from the site without negative impacts.[34]

- **Traffic Volume:** The road serving Lower Wych currently experiences a low level of traffic. In 2023, it carried an average of 211 vehicles per day, which is well below the 1,000 vehicles/day capacity typically recommended for minor rural roads. This is further supported by the fact that traffic volumes have remained stable over six years, ranging from 167 to 211 vehicles/day. The low traffic volume contributes to a safe and quiet environment conducive to walking and cycling.[34]
- **Vehicle Composition:** The road primarily supports residential traffic, with cars and taxis comprising the majority of the daily vehicle count. Light goods vehicles (LGVs) make up approximately 19% of the traffic, reflecting typical rural service and farm activity, while heavy goods vehicles (HGVs) account for only 6%. Over five years, HGV traffic has declined, further reducing the environmental impact and enhancing the safety of pedestrians and cyclists along the road.
- **Opportunities for Active Travel:** With the current road traffic so low, the infrastructure is ideal for cycling and walking. The Department for Transport data shows that cycling counts are currently low but demonstrate a potential for growth, as traffic volumes and the road environment are favorable for active travel. Encouraging cycling will be an integral part of the transport strategy for Lower Wych, promoting healthier, low-carbon travel.[34]

2.12.3 Public Transport Availability

Lower Wych is located in a rural area, but it benefits from a relatively strong public transport infrastructure, providing residents with viable alternatives to car use for both local errands and longer journeys.

- Bus Services: The site is within reach of bus services at Eglwys Cross Farm and Malpas High Street. The bus stop at Eglwys Cross Farm is approximately 2.2 miles from the site and connects to Whitchurch and Wrexham via the X46 / 146 corridor. The Malpas High Street stop is approximately 2.5 miles away and connects to Whitchurch and Chester via the 41 corridor. Service frequency and journey times are set out in Section 11.[35]
- Rail Services: Whitchurch railway station is approximately 6 miles from Lower Wych and provides access to national rail services including Crewe, Shrewsbury, Manchester and Cardiff. Wrexham General station is approximately 12 miles away and Chester station approximately 16 miles away, providing further regional and inter-city connections. These rail options make longer journeys possible without relying solely on private car use.[33][36]

2.12.4 Summary of Baseline Travel Analysis

- **Current Travel Patterns**: The baseline analysis of travel patterns at Lower Wych reveals a modest travel demand. The proximity to essential services such as schools, healthcare, and shops significantly reduces the need for frequent trips by car. Public transport options, including local buses and regional rail services, are available for longer journeys, minimising the dependency on private vehicles.
- **Low Traffic Impact**: The low volume of traffic on the road (211 vehicles/day) and the lack of heavy goods traffic make the surrounding environment conducive to active travel. These factors support the OPD objective of reducing car use and encourage walking and cycling, both of which are practical in the current context.
- **Sustainable Transport Potential**: With a mix of good public transport options and quiet, low-traffic roads, Lower Wych has the potential to achieve a low-carbon, low-impact transport strategy. The current transport conditions already support a reduction in car dependency, with cycling and walking as viable alternatives for many daily trips.

In summary, the transport baseline for Lower Wych provides a clear picture of the current conditions that support the OPD approach to low-impact living. The site's location benefits from strong public transport options, a low-traffic environment, and proximity to essential services, all of which are key to reducing the ecological footprint of transport. These baseline conditions provide a solid foundation for implementing a sustainable, low-carbon transport strategy that minimizes the need for private vehicle use and supports the long-term goals of the One Planet Development.

2.13 Visibility

See Section 9 for full detail on existing and future views of the site.

The visual impact assessment of the Lower Wych site is a key part of understanding how the proposed One Planet Development will integrate into the landscape and how it can enhance, rather than detract from, the scenic character of the Welsh-English borderlands. Visibility is considered from two directions: views from the site outward to the surrounding area, and views towards the site from external viewpoints. Because there are no public rights of way crossing the site and because of the local topography and mature hedgerow screening, views are extremely limited. [14]

Topographical context and visual envelope

The site lies on a gently sloping terrace above the valley of the Wych Brook. The position affords a degree of natural screening from many distant viewpoints, while still offering pleasant views north across the valley. The surrounding pattern of mature hedgerows, woodland and gentle landform means the site's visual envelope is contained.

The mature hedgerows that bound the site provide effective screening for the lane access and nearby dwellings. The hedgerow structure contributes to the sense of enclosure and intimacy characteristic of the ancient hedged countryside of the English Maelor / Wych Valley interface.

Because of the combination of landform, vegetation and lack of public vantage points, the site is not visible from any major road or high-visibility public viewpoint. Detailed assessment of viewpoint photographs, predicted visibility and mitigation is provided in the Landscape and Visual Impact section.

For detailed analysis of viewpoints, please refer to Section 9 of this management plan. The full technical Landscape and Visual Impact section includes photomontages and visibility maps.

2.14 Minerals Safeguarding

The Council's pre-application response identified the application site as lying within a Sand and Gravel Safeguarding Area as shown on the BGS Aggregates Safeguarding Map of Wales (2012). That safeguarding map is a broad, policy-oriented tool prepared to assist Mineral Planning Authorities in defining safeguarding areas in Local Development Plans. It was derived from the National Mineral Resource Map of Wales and includes a precautionary margin around superficial sand and gravel resources. It should therefore be distinguished from a site-specific assessment of whether workable mineral would in practice be sterilised by the proposed development.[39][40][45]

The relevant planning issue is whether the proposal would unnecessarily sterilise a mineral resource or prejudice its future working. Minerals safeguarding is addressed through Planning Policy Wales, Future Wales 2040, Minerals Technical Advice Note 1 and the adopted Wrexham UDP minerals policies, including MW9 and MW11. These policies seek to avoid unnecessary sterilisation of resources and manage the relationship between mineral resources and sensitive development, while recognising that not all non-mineral development within a safeguarding area is unac-

ceptable.[41][42][43][44]

For this reason, the application distinguishes between the broader 2012 safeguarding layer and the underlying mapped superficial sand and gravel resource. The Minerals Safeguarding Plan identifies the safeguarding context for the holding, while the separate Mineral Resource and Mineral Safeguarding Assessment explains the underlying resource position, the relationship with the proposed layout, and the MW9 / MW11 policy tests in more detail.[38][39][40][45]

The proposed One Planet Development has been designed so that the dwelling, main access, parking area, principal drainage infrastructure and ancillary buildings avoid the mapped mineral resource area as far as practicable. Areas within or closest to the mapped resource are retained for woodland, habitat management, meadow, coppice or other light-touch land-based uses rather than substantial built development or deep excavation. This approach keeps the land productive while avoiding unnecessary sterilisation of the underlying mineral resource.[38][39][45]

The development also has a high degree of reversibility. The proposed WikiHouse timber cassette system and low-impact construction strategy, including screw-pile foundations where practicable, materially reduce the long-term sterilisation effect when compared with conventional masonry construction, deep strip foundations or extensive impermeable hardstanding. The OPD management plan, monitoring regime and five-year review process also mean that the development remains tied to its land-based function rather than becoming an unrestricted residential use.[45]

Minerals safeguarding is therefore treated as a baseline constraint that has shaped the proposed layout, not as a reason to avoid the site in principle. The detailed assessment is provided in the standalone Mineral Resource and Mineral Safeguarding Assessment appendix.

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3.Design & Development Strategy

3. Design & Development Strategy

3.1. Introduction and Vision

This section explains the spatial and operational design strategy for the proposed One Planet Development at Lower Wych. It shows how the dwelling, access, food production, land management, energy, water, waste and community elements are arranged as one integrated land-based use.

The design objective is practical rather than decorative: to create a small, efficient, low-impact holding that can meet the household's minimum needs from the land, enhance biodiversity, remain visually contained within the existing field pattern, and be monitored transparently over time.

The detailed evidence for each technical element is set out in the specialist chapters that follow. Section 4 covers the land-based livelihood and minimum-needs business case; Section 5 covers land management and biodiversity; Section 6 covers energy and water; Section 7 covers waste; Section 8 covers zero-carbon buildings; Section 9 covers landscape and visual impact; Section 11 covers transport; Section 12 covers the Ecological Footprint Analysis; and Section 13 covers phasing, monitoring and the exit strategy.

At design level the strategy follows the OPD Practice Guidance and TAN 6 requirements for a binding, monitored management plan, and responds to Planning Policy Wales Edition 12 and the residual Wrexham UDP policies relevant to sustainable development, design quality and buildings in the countryside, including PS2, GDP1 and EC6.[50][51][75][76]

3.2. Core Objectives and Design Principles

Of the eleven core objectives set out in the Introduction, the objectives most directly relevant to the Design and Development Strategy are summarised below.

Core objectives:

Land-based financial self-sufficiency: establish a viable land-based livelihood that meets the household's minimum needs by Year 5 without relying on off-site income.

Ecological-footprint reduction and energy independence: reduce demand first, then meet the remaining household and enterprise energy needs from renewable sources arising directly from the site.

Very low-carbon construction and operation: use a low-impact, reversible building system, high-performance fabric and on-site renewable energy, with whole-life carbon accounted for in the Zero Carbon Buildings chapter.

Food self-reliance: produce a significant proportion of the household's food on site through market-garden beds, polytunnels, orchard, perennial crops, poultry and complementary enterprises.

Biodiversity and landscape enhancement: retain the existing woodland, hedgerows and mature trees, and add meadow, orchard, pond, wetland, coppice and pollinator habitats.

Community integration: provide modest, managed opportunities for local food, learning, seasonal events and knowledge-sharing, limited to the small-scale programme assessed in Sections 10 and 11: up to four small seasonal events per year by Year 5, normally with no more than 12 attendees, plus 2-4 educational or school visits annually, without creating unacceptable traffic, noise or amenity impacts.

Circular resource use: keep water, nutrients, biomass and organic residues circulating safely within the holding wherever this is practical and lawful.

Water independence and natural treatment: rely primarily on rainwater harvesting, water-efficient fixtures, source-separated sanitation and conservative greywater treatment.

Design principles:

Fit the site, rather than impose a standard layout. Buildings and productive areas are located where they avoid the woodland, root protection areas and sensitive habitat edges, while using existing enclosure and landform for shelter and screening.

Cluster built form. The dwelling, workshop, processing and technical spaces are kept in a compact cluster to minimise

land take, service runs, visual spread and access impact.

Keep systems simple and auditable. Energy, water, waste and land-management systems are designed so that annual monitoring can be based on clear records rather than assumptions.

Use appropriate technology. The design prioritises passive design, manual management, low-energy systems and repairable equipment before more complex technical solutions.

Protect reversibility. The WikiHouse system, screw-pile foundations, modular services and low-impact access strategy support the exit and restoration requirements set out in Section 13.

Figure 3-1: Whole-Site Integrated One Planet System

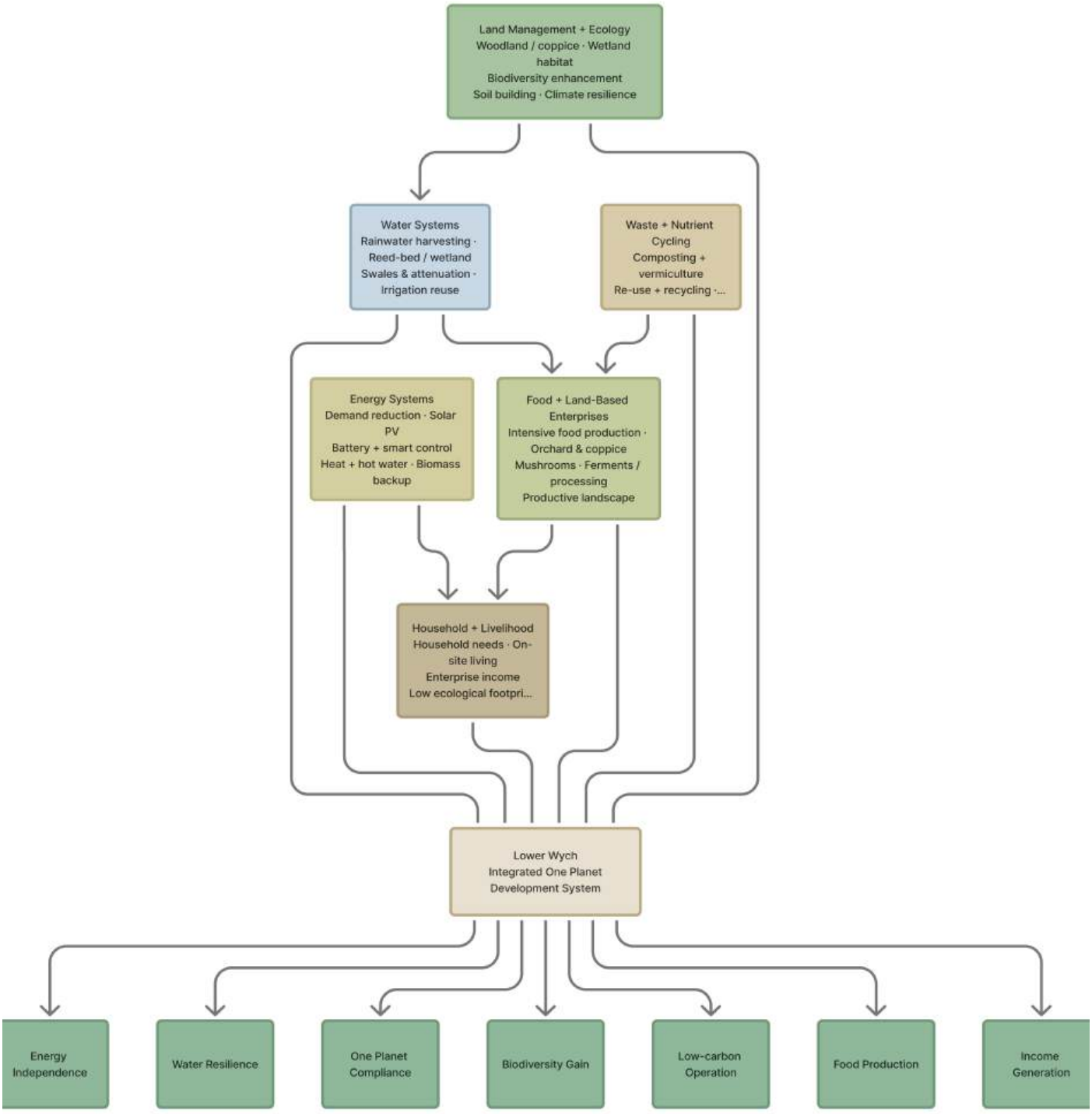


Figure 3-1: Whole-Site Integrated One Planet System. The diagram shows how land management, ecology, water, waste, energy, food production and household livelihood operate together as an integrated One Planet Development system at Lower Wych

Figure 3-2: Illustrative view of the proposed dwelling, enterprise building and market garden



Figure 3-2: Illustrative visualisation of the working holding, viewed from the productive growing area looking north toward the building cluster.

Figure 3-3: Seasonal solar-hours analysis

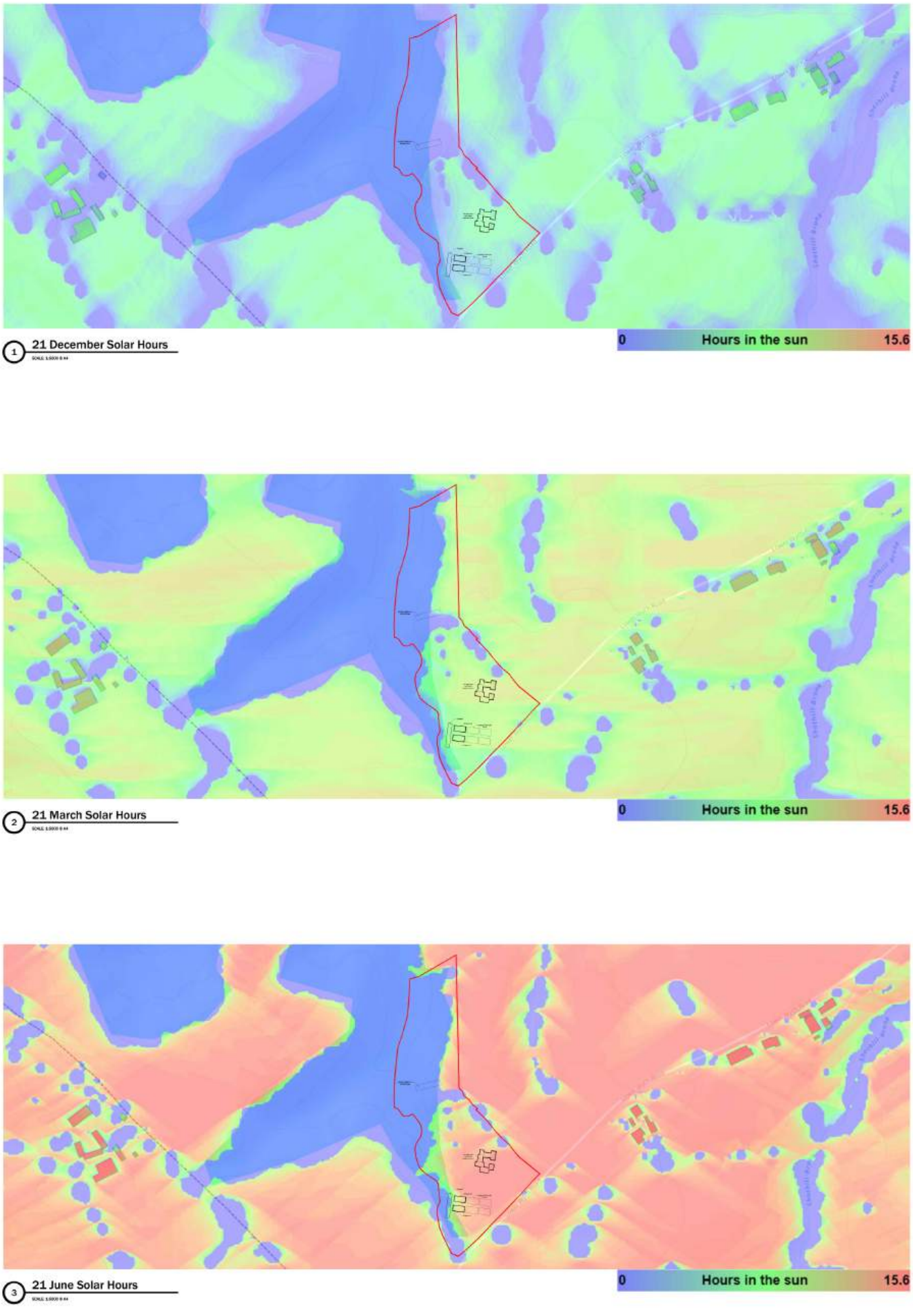


Figure 3-3: Seasonal solar-hours analysis for 21 December, 21 March and 21 June. The analysis illustrates the seasonal solar resource across the holding and supports the siting of the dwelling roof, roof-first PV strategy.

3.3. Site Analysis and Design Rationale

The layout responds to the site's size, enclosure, soil, slope, access, existing vegetation and relationship with the Wych Brook catchment. The aim is to place the more intensive uses where they are operationally convenient and visually contained, while reserving the woodland, hedgerows, wetter margins and habitat areas for ecological enhancement.

3.3.1. Site Selection and Suitability

The Lower Wych site was selected because it is large enough to support a small mixed land-based livelihood, while remaining manageable for two adults using low-impact methods. The following characteristics have shaped the design:

Size and topography: the 5.12-acre / 2.07 hectare holding has an actual title-deed area of 20,710 m², with 20,700 m² used as the rounded land-use audit basis. It is sufficient for a compact dwelling and enterprise cluster, productive beds, polytunnels, orchard, meadow, woodland management, wetland and wildlife areas. The gentle fall assists drainage and allows water to be slowed, stored and infiltrated on site.

Soil quality: the RHS soil analysis identifies a clay-loam soil with pH 6.5, medium organic matter, medium available phosphorus, low available potassium and medium magnesium. This is suitable for diversified horticulture, provided potassium and soil-structure improvements are addressed through compost, mulches, green manures and the land-management measures in Section 5.

Aspect and shelter: the site has good solar exposure for the dwelling roof, PV generation and protected growing, while existing hedgerows and woodland provide shelter from wind and visual containment.

Water resources: the dwelling roof and ancillary roofs provide substantial rainwater-harvesting potential. Productive crops are supplied from harvested rainwater, not treated greywater.

Accessibility: the existing gateway gives direct access to the public highway. Access, parking and visibility are dealt with in the Transport and Accessibility chapter and the supporting plans.

Landscape context: the site is enclosed by woodland, hedgerows and mature trees. The design uses that enclosure to keep the development recessive and rural in character.

Where the baseline identifies land that may fall within the best and most versatile agricultural land category, the design response is to retain and intensify productive agricultural and horticultural use rather than remove it from production. Built form is kept compact, while the remaining land is managed for food production, orchard, grazing, soil improvement and ecological support functions in accordance with the PPW 12 approach to BMV land.[75]

3.3.2. Climate and Microclimate Analysis

The local climate is mild and wet, with rainfall sufficient to support a rainwater-led domestic and productive-water strategy when combined with storage and demand reduction. The design therefore treats roof catchment, tank capacity, mulching and drip/seep irrigation as core infrastructure rather than optional additions.

The south and south-west facing roof areas are used for the roof-first PV strategy, this makes use of the dwelling itself as the main renewable-energy platform.

The woodland edge and hedgerows create cooler, shaded microclimates. These are used carefully for compatible activities such as outdoor mushroom logs and low-technology wasabi beds, while keeping productive infrastructure outside root protection areas and avoiding light spill or disturbance into the woodland.

The seasonal solar-hours analysis at Figure 3-2 confirms that the proposed building cluster and roof-first PV strategy are located within the more favourable solar part of the holding, while the shaded woodland-edge microclimate is retained for lower-light specialist uses such as mushroom logs and wasabi beds.

3.3.3. Ecological Baseline and Enhancement Strategy

The ecological baseline comprises semi-improved / other neutral grassland, existing hedgerows, scattered mature trees, P1 and a block of lowland mixed deciduous woodland. These features define the limits of the development layout. The dwelling, access, processing areas and intensive beds are located away from the woodland, mature-tree root protection areas, retained pond and dark habitat corridors.

The layout also responds to the ecological tree and pond baseline. The Arbtech Preliminary Ecological Appraisal v2

records sixteen scattered trees (T1-T16), with mature oaks, hawthorn and semi-mature oaks retained as habitat and landscape features. Follow-up eDNA evidence confirms great crested newt presence in P1 and P5, with P2 / the relevant wider pond context treated on an assumed-presence basis where access was not secured. Built form, access, productive infrastructure and specialist crops are therefore kept outside mapped root-protection areas, retained woodland / LWS habitat, P1 and dark corridors. Construction-stage tree protection, pollution prevention, GCN RAMS, CEMP and stop-work procedures will control the works.

External lighting will be avoided wherever possible. Where lighting is required for safe access or animal welfare, it will be low-level, warm-spectrum, downward-facing, motion-controlled and time-limited, in accordance with ILP/BCT Guidance Note GN08/23. No lighting will be directed toward the retained woodland edge, hedgerows, mature trees, pond margins or dark habitat corridors, and the design objective is to maintain no material light spill into these features. [85]

Enhancement is delivered through a mosaic of habitats: managed meadow / scrub-grassland mosaic, wildflower meadow, pollinator strips, the retained pond P1, two new dual-purpose clean-water irrigation reserve / attenuation ponds with planted wildlife margins, a 15 m² constructed greywater reedbed, a separate 6 m greywater polishing pond / planted wetland cell, orchard understorey, strengthened hedgerows, new coppice, deadwood retention and darker habitat corridors. The detailed prescriptions, timing and monitoring indicators are set out in Section 5.

The design deliberately integrates productive and ecological functions. Orchard, wildflower meadow, pollinator strips and H6 managed meadow / scrub-grassland mosaic support pollinators; coppice provides habitat and a small resilience woodfuel supply; P1 and the two clean-water ponds provide habitat, water attenuation and irrigation-reserve functions; the greywater reedbed and separate polishing pond treat domestic greywater before infiltration / non-edible planting; compost and mulches build soil structure while reducing waste export.

3.4. Land Use and Activity Zones

The site is organised into a small number of functional zones. These are not hard boundaries, but management areas that help explain how the holding will operate.

3.4.1. Zone 1: Dwelling and Enterprise Core

Zone 1 contains the dwelling, workshop / processing space, technical room, stores, immediate outdoor work areas and permeable parking. It is the most intensively used part of the site and is kept compact to reduce land take, service runs and visual spread.

The dwelling is positioned to benefit from solar orientation, existing enclosure and convenient access to productive areas. The workshop and food-processing spaces sit close to the dwelling so that produce handling, monitoring, equipment maintenance, storage and administration can be carried out efficiently.

3.4.2. Zone 2: Intensive Food Production

Zone 2 contains the annual vegetable beds, polytunnels, nursery / propagation areas, microgreens space and related irrigation infrastructure. It is located close to the dwelling and workshop because these crops need frequent observation, watering, harvesting, washing and packing.

The productive beds are managed using no-dig or low-disturbance methods, compost, mulches, green manures and rotations. Irrigation is supplied from harvested rainwater through efficient distribution, with treated greywater excluded from edible-crop irrigation.

3.4.3. Zone 3: Orchard, Agroforestry and Low-Technology Specialist Crops

Zone 3 contains the orchard, perennial crops, food-forest elements, mushroom logs and low-technology wasabi beds. These uses require less daily disturbance than annual beds but still benefit from regular monitoring and proximity to the enterprise core.

The wasabi area is located near the woodland edge to benefit from shade and a cooler microclimate, but it remains outside sensitive woodland habitat and root-protection areas. It is designed as outdoor gravel-and-pebble prepared beds, not as a heated or sealed controlled-environment crop.

3.4.4. Zone 4: Conservation, Woodland, Water and Habitat Creation

Zone 4 includes the retained woodland, managed coppice, managed meadow / scrub-grassland mosaic, wildflower

meadow, pollinator strips, the retained pond P1, two 10 m clean-water irrigation reserve / attenuation ponds with planted wildlife margins, the 15 m² constructed greywater reedbed, the separate 6 m greywater polishing pond / planted wetland cell and other habitat features. These areas provide biodiversity gain, water attenuation, shelter, carbon sequestration and the small quantity of biomass needed for winter resilience.

Management intensity is lowest in this zone. Interventions are focused on habitat quality, woodland structure, invasive-species control, careful cutting or grazing regimes, deadwood retention, pond/wetland maintenance and ecological monitoring.

3.5. Site Management and Phasing

The phasing below is a design-summary version of the detailed programme in Section 13. It follows the OPD Practice Guidance by linking pre-development preparation, first habitation and early production, system integration, mid-term EFA assessment, optimisation and the Year-5 review to the binding management plan.

3.5.1. Pre-Development and OPD Year 1: Establishment

Before first habitation, the focus is on surveys, soil testing, ecological safeguards, access preparation, procurement, early low-capital trials and the main dwelling construction sequence. The WikiHouse components and screw-pile foundation approach allow the building to be assembled with limited ground disturbance and a high degree of reversibility.

OPD Year 1 is triggered by first habitation of the dwelling. During Year 1, the dwelling and essential services are completed, the PV array is installed on the roof, early market-garden beds and polytunnels are brought into production, orchard planting begins, poultry and starter enterprises are introduced, and the first annual monitoring return is prepared.

If the secondary micro-dairy enterprise is activated, animal infrastructure for the small dairy-goat enterprise, including paddock subdivision, mobile shelters, milking arrangements and processing-space preparation, would be prepared only once welfare, registration, labour and land-management requirements are in place. Herd introduction would not occur before Year 2 and would follow commissioning of the dwelling, water, waste and energy systems.

3.5.2. OPD Years 2-3: System Integration and Verification

Year 2 focuses on integrating the systems: storage, cold storage, food-preservation space, maturing beds, expanded mushroom and microgreen production, continuing habitat creation, wetland establishment and woodland-edge management. Section 13 sets the Year-2 food self-sufficiency milestone at 35%.

If the secondary micro-dairy enterprise is activated, herd establishment and food-business / milk-production registration would begin no earlier than Year 2. Any first cheese sales would be targeted from Year 3 only after the relevant welfare, registration, HACCP-based food-safety, Environmental Health and milk-hygiene inspection requirements are in place.

Year 3 is the mid-term verification point. The monitoring return includes the Ecological Footprint Analysis, and the design is reviewed against actual performance. Enterprise development, including wasabi, is expanded only where trial evidence supports it. Any corrective actions identified through monitoring are folded back into the management plan.

3.5.3. OPD Years 4-5 and Long-Term Stewardship

Year 4 is used for optimisation and resilience building. Systems are adjusted based on three years of evidence, food self-sufficiency is increased, habitat areas mature, and community engagement expands in a controlled way.

By Year 5 the development aims to meet the OPD targets set out in the full management plan, including at least 65% food self-sufficiency, the Year-5 enterprise income target and a full five-year review. The updated management plan and ongoing monitoring programme then provide the basis for long-term stewardship beyond Year 5.

3.6. Need to Live On-Site

The need to live on site arises from the combined daily requirements of crop care, animal welfare, water and energy management, food processing, ecological monitoring, security and rapid response to weather events. These are operational requirements of the OPD system, not matters of convenience, and address the TAN 6 requirement to justify the need to live on the site by demonstrating the relationship between the land-based use, the number of occupants,

the work required to run the holding and the return gained.[51]

The land-based livelihood depends on timely observation and intervention. Seedlings, polytunnel crops, low-energy microgreens, mushroom logs, poultry / livestock, irrigation, processing and harvested produce all require regular attention. Delayed response can quickly lead to crop loss, welfare issues, water waste or reduced product quality.

When the secondary micro-dairy enterprise is active, twice-daily milking through the lactation period, daily welfare checks of the dairy herd, and time-critical cheese-making and ageing routines would further reinforce the operational need for continuous on-site presence. The core locational need, however, also arises from perishable crops, protected cropping, mushroom systems, water management, poultry care, processing and daily land-based monitoring.

The zero-carbon and water systems also depend on active management. Battery state of charge, low-solar operating mode, thermal-store performance, rainwater levels, filters, pumps, dry-toilet chambers and greywater treatment all require routine checks and annual records.

The ecological strategy likewise requires regular presence: checking fences, observing ponds and wetland performance, protecting young trees, managing grazing or cutting regimes, preventing light spill and identifying any emerging ecological or invasive-species issues. Living on site is therefore integral to achieving and evidencing the OPD commitments.

3.7. Site Management Activities and Responsibilities

The management of the holding will be shared between the two applicants and structured around seasonal priorities. Section 4 provides the detailed labour and enterprise plan, while Section 13 sets out the monitoring, corrective-action and review framework.

In practice, management is organised around five recurring workstreams:

Food and enterprise work: sowing, propagation, crop care, harvesting, processing, packing, potential twice-daily milking during lactation if the secondary micro-dairy is activated, goat herd care where relevant, cheese-making and ageing where relevant, poultry care, sales and record keeping.

Land and ecology work: meadow cutting, hedgerow management, woodland/coppice work, orchard care, pond and wetland checks, invasive-species monitoring and habitat records.

Energy and water work: PV/battery monitoring, thermal-store and ASHP checks, biomass-fuel logging, rainwater-tank checks, filter maintenance and greywater-reedbed inspection.

Waste and nutrient work: compost management, dry-toilet chamber rotation, urine separation / nutrient recovery records, recycling and residual waste logs.

Community engagement and administration: monthly data logs, annual OPD monitoring return, EFA updates, financial records, risk reviews, neighbour communication, newsletters, feedback records, controlled seasonal events, school / learning visits and transport coordination.

This structure keeps the design deliverable. If time, weather or illness restricts capacity, non-essential community events and secondary enterprises can be reduced before core food, income, welfare, energy, water and ecological commitments are compromised.

3.8 Buildings, Infrastructure and Food Systems

3.8.1 Building Design and Construction

The dwelling uses the locked WikiHouse Skylark 250 Plus specification. The structural system is a CNC-cut 18 mm OSB3 interlocking timber-cassette chassis on removable ground-screw piles. The wall cassettes are insulated with sheep's wool, with the Section 6 fabric schedule applying 60 mm external Steico woodfibre over-insulation to walls and floor and 100 mm external Steico woodfibre to the roof. The build-up also includes a high-performance airtightness / vapour-control membrane (e.g. INTELLO PLUS or equivalent), plasterboard lining with lime-plaster skim, ventilated Welsh-sawn larch rainscreen cladding, triple-glazed FSC hardwood timber windows, cork flooring, standing-seam metal roofing to the sloped roof areas and EPDM to flat roof areas. [74]

The provenance, embodied-carbon assumptions, durability strategy and end-of-life treatment for the principal construction materials are set out in Section 8, including the material schedule for OSB3 / plywood, woodfibre insulation,

sheep's wool, larch cladding, roofing and membranes, and the WikiHouse timber-chassis carbon comparison against conventional masonry construction.

This palette supports the OPD requirements because it is low-impact, largely dry-assembled, repairable and capable of being dismantled. The reversibility claim is based on the removable screw-pile foundation strategy, dry-assembled timber-cassette chassis and modular services, rather than on permanent masonry foundations or a concrete slab. The WikiHouse chassis can be systematically removed if the exit strategy in Section 13 were ever triggered.

The fabric strategy is reduce-first: high insulation, very low infiltration, triple glazing, careful thermal-bridge detailing and MVHR reduce demand before the renewable system is sized. The headline values are wall U-value 0.123 W/m2K, roof U-value 0.108 W/m2K, floor U-value 0.128 W/m2K, window Uw target 0.80 W/m2K and airtightness target of 3 AC/H @ 50 Pa.

3.8.2 Energy Systems

The roof-mounted PV array is sized at approximately 20.9 kWp, using indicatively 36 high-output modules at around 580 W each. Battery storage is a 50 kWh bank, with approximately 40 kWh usable storage, supported by an 8-10 kW class inverter / charger. [73]

Primary heat is provided by a 6-8 kW air source heat pump feeding an approximately 600 litre thermal store. The thermal store allows daylight PV generation to be converted into stored heat, reducing winter battery cycling and enabling evening and night-time heat use.

A single room-sealed Ecodesign-ready boiler stove is included for low-solar event mode only. It is plumbed to the thermal store, supplied with dedicated external combustion air and operated alongside MVHR using appropriate commissioning and spillage safeguards. Final appliance, flue, combustion-air and MVHR interaction will be confirmed at Building Regulations stage by a competent installer / designer, including commissioning and spillage testing. Its role is resilience, not everyday heating.

The adopted planning-stage electrical input demand is approximately 5,170 kWh/year. This includes domestic regulated and unregulated loads, MVHR, pumps and controls, ASHP input and modest enterprise / ancillary loads; the detailed split is set out in Section 6. The PV array is expected to provide approximately 17,000-20,000 kWh/year of gross roof-array resource before curtailment. Because this is an off-grid system, the array is sized for winter resilience and battery preservation. The design therefore relies on seasonal operating logic as well as annual yield: critical-load separation, battery monitoring, thermal storage, daylight-first ASHP operation and discretionary-load curtailment during prolonged dull periods.

Energy monitoring will record PV generation, domestic electrical use, enterprise / ancillary electrical use, battery low-state-of-charge events, low-solar event days, ASHP operation and biomass use. These records feed directly into annual OPD monitoring.

3.8.3 Water Systems

The revised water strategy separates clean rainwater, non-potable irrigation water, greywater and human-waste streams. This keeps the system conservative, auditable and protective of the River Dee catchment, and supports the HRA screening position set out in Section 2 and the detailed water, wastewater and nutrient controls in Sections 6 and 7.

Potable domestic supply is provided by rainwater harvested from the dwelling and ancillary roof catchment to 40,000 L of primary storage, with first-flush diversion, filtration and UV polishing before domestic use. Section 6 and Appendix J.1 use a domestic design target of 70 litres/person/day for four occupants, equivalent to 280 litres/day and 102,200 litres/year (102.2 m3/year).

Appendix J.1 adopts Shawbury 1991-2020 rainfall as the planning rainfall basis: 682.53 mm/year, selected as the most representative long-term station for Lower Wych's inland lowland / rain-shadow setting. A dry-year stress floor of 510 mm/year, approximately 25% below the Shawbury mean, is used for resilience testing. On the current 259 m² potable roof catchment, comprising 143 m² of standing seam / sloped roof catchment and 116 m² of EPDM flat-roof catchment, the mean-year harvest is approximately 155,139 litres/year and the dry-year harvest approximately 115,923 litres/year, both above the domestic design demand before allowing for separate non-potable irrigation storage. The separate 44 m² green roof is excluded from potable rainwater harvesting and drains to landscape attenuation / swales.

Non-potable irrigation water for edible crops, including wasabi and market-garden areas, is collected separately from

ancillary roofs and polytunnels. Treated greywater is not proposed for edible-crop irrigation.

Greywater from showers, basins, laundry and kitchen-preparation water is treated through a 15 m2 horizontal sub-surface-flow reedbed with infiltration back-up. The dwelling uses urine-diverting dry toilets, so no blackwater enters the greywater system; separated human-waste streams are managed under Section 7.

3.8.4 Workshop and Food Processing Facilities

The workshop and processing spaces support the land-based enterprises without becoming a separate industrial use. Their functions are produce washing, packing, drying, fermentation, seed and tool storage, small-scale repair, stock control and administration.

The design keeps processing close to production so that harvested crops can be handled quickly and hygienically. Energy-intensive processing is avoided. Where temperature control is needed, it is limited to small insulated cabinets, cool storage or low-energy equipment rather than large continuously conditioned rooms.

3.8.4.1 Wasabi Cultivation System

Wasabi production is based on a low-technology outdoor system using shaded gravel-and-pebble prepared beds near the woodland edge. It is not proposed as a heated greenhouse, hydroponic room or sealed controlled-environment crop.

Approximately 100 m² of prepared outdoor growing beds positioned to benefit from the cooler woodland-edge microclimate.
Beds located outside root-protection areas, the retained woodland and other sensitive habitats.
Graded gravel and rounded pebble layers used to create a cool, moist and free-draining root zone.
Shade provided by the existing woodland edge and retained hedgerows, supplemented by lightweight shade cloth or seasonal natural screening where required.
Low-pressure drip or seep irrigation supplied from clean harvested rainwater or the clean-water irrigation reserve.
No treated greywater, reedbed effluent or nutrient-rich runoff used on the crop.
Trial-to-production phasing, with expansion only where the initial beds demonstrate suitable temperature, moisture, disease control and yield.

3.8.4.2 Mushroom Production Facilities

Mushroom production is based on low-energy methods: outdoor log cultivation in shaded areas, small-scale fruiting in insulated spaces where required, passive humidity management, and careful hygiene.

Shiitake, oyster and lion's mane production using logs and small block substrates.
Shaded outdoor log stacks positioned where they do not disturb woodland roots or habitat features.
Small insulated fruiting / holding space for seasonal reliability, using intermittent low-energy ventilation or humidity support where needed.
Simple harvesting, packing and cool-storage arrangements within the workshop / processing area.
Spent mushroom substrate reused as compost input, mulch or soil-building material under the waste strategy.

3.8.4.3 Microgreens Production System

Microgreens are a low-capital, quick-return enterprise that can begin early in the phasing programme. Production is kept small, clean and energy-efficient. Microgreens will be produced in low-energy bench / tray systems using passive buffering, natural daylight where practical, efficient LED task lighting only where required, and monitored electrical use within the Section 6 enterprise-load allowance.

Low-energy benches or trays using natural daylight in polytunnels or a bright protected space, with efficient LED task lighting only where required for establishment, winter reliability or food-safety workflow.
Efficient watering from harvested rainwater.
Harvesting, washing and packing within the workshop / processing area.
Seed storage and germination space close to the enterprise core.
Crop residues returned to the composting system.

3.8.4.4 Fermentation Workshop

The fermentation enterprise adds value to site-grown surplus and supports the zero-waste strategy. It is designed as small-batch food processing, not as a high-energy industrial process.

Clean preparation area linked to the business kitchen / packing area.
Small insulated fermentation cupboards or chambers where controlled temperature is needed.
Reusable jars, deposit systems and clear labelling.
Storage for salt, jars, lids and finished products.
Brines, trimmings and residues managed through the waste and nutrient strategy.

3.8.5 Intensive Horticulture Systems

3.8.5.1 Annual Vegetable Production

The annual vegetable system provides the core household food base and a proportion of the CSA / local produce offer. The design uses permanent beds, organic fertility, low-disturbance cultivation and crop rotation.

Leafy greens and salads for frequent harvest.
Calorie and protein staples including potatoes, beans, peas, squash and storage roots for autumn and winter food security.
Brassicas, legumes and alliums for seasonal diversity.
Fruiting crops in protected growing areas.
Green manures, compost and mulches to build soil structure and address the low-potassium baseline.

The OPD compliance target remains at least 65% food self-sufficiency by Year 5. Higher seasonal self-reliance is a management ambition, but the compliance case is based on the Year-5 target set out in the wider plan.

3.8.5.2 Protected Growing Systems

Two 6 m x 12 m polytunnels provide season extension and protection for tender crops.

Passive solar gain and manual ventilation.
Rainwater collection for non-potable irrigation storage.
Moveable benches or flexible bed layouts.
Protection for early and late crops, propagation and microgreens.
No reliance on continuous heating for routine production.

3.8.5.3 Soil Management and Fertility

Soil management is based on measured improvement from the baseline rather than generic claims. The RHS soil analysis records 6.2% organic matter and identifies low available potassium. The management response is to build soil biology and nutrient balance over time.

Compost applications from on-site organic residues where safe and appropriate.
Mulches, green manures and cover crops to protect soil and increase biological activity.
Minimal cultivation to preserve structure and reduce compaction.
Targeted potassium improvement through approved organic amendments and closed-loop fertility.
Repeat soil testing to check pH, organic matter and nutrient trends.

3.8.6 Agroforestry and Perennial Systems

3.8.6.1 Orchard Development

The orchard provides long-term food production, pollinator habitat, shelter, landscape integration and value-added produce.

Traditional and resilient apple, pear, plum and other fruit varieties suited to the local climate.
Nut trees and fruit bushes where space and shelter allow.
Pollinator-friendly understorey planting and reduced mowing.
Tree protection and formative pruning in the establishment years.
Use of surplus fruit in fresh boxes, drying, preserves and fermentation.

3.8.6.2 Food Forest and Perennial Planting

Food-forest and perennial planting is used selectively where it supports the wider layout rather than competing with the core market-garden area.

Canopy and sub-canopy fruit or nut trees.
Fruit bushes, herbs and perennial vegetables.
Ground-cover planting for soil protection and pollinator value.
Comfrey, nitrogen-fixing plants and dynamic-accumulator species where useful.
Low-input management once established.

3.8.7 Livestock Integration and Management

3.8.7.1 Goats and Farm Cheese

The micro-dairy element is a secondary / future enterprise rather than a core minimum-needs assumption. If activated, it would be a small artisan goat-cheese enterprise scaled to the holding, to animal-welfare constraints and to the labour available from two adults working within the wider land-based system. Indicative scale would be a herd of 2-3 milking does. Milk would be processed on site into small batches of fresh goat cheese and, where practical, matured goat cheese.

The micro-dairy enterprise would operate within the registered food-business / retail-exemption pathway rather than as an Approved Establishment, subject to confirmation with Wrexham County Borough Council Environmental Health before trading. Direct sales would be primarily to final consumers through farm-gate collection by appointment, pre-arranged local collection, and one or two local farmers' markets within Wrexham, Flintshire and north Shropshire. Any supply to other food businesses would be limited to a small number of local retail or catering outlets and kept marginal, localised and restricted. In practice, this means that any supply to other food businesses would remain below the relevant marginal threshold, would be local in extent, and would be restricted to the goat-cheese products described in the Section 4 business plan.[77][78][79][80][81]

The regulatory framework for any activated micro-dairy enterprise is addressed in Section 4, including FSA milk-production-holding registration, Wrexham food-business registration, HACCP-based food-safety procedures, milk hygiene inspection, animal identification and movement records, CPH / keeper registration requirements, labelling, traceability, batch records, and any Environmental Health advice or inspection required before trading. No raw drinking milk sales, on-site slaughter or meat sales are proposed as part of this enterprise.[77][78][79][82][83]

Day-to-day management includes:

twice-daily milking through the lactation period, with seasonal dry periods;
daily welfare checks, health records and veterinary support;
rotational grazing and browsing across designated paddocks to avoid overgrazing or poaching;
controlled use of goats for low-impact vegetation management along suitable hedgerow and rough-edge locations;
mobile or low-impact shelters, with winter accommodation close to the workshop / processing cluster;
cheese-making in a small dedicated processing space within the workshop / food-processing area;
controlled-temperature storage for ageing or holding cheese where required; and
manure and bedding returned through the composting system to support soil fertility in the market garden and orchard.

The enterprise is phased conservatively. Paddock subdivision, shelter, milking and processing-space preparation are undertaken during the establishment phase. Herd introduction occurs from OPD Year 2, after the dwelling, water, waste and energy systems are commissioned. First cheese sales are targeted from Year 3 only once milk-production registration, food-business registration, HACCP-based food-safety procedures, Environmental Health engagement and milk-hygiene arrangements are in place.

Expansion of the herd or sales network is conditional on demonstrated welfare standards, regulatory compliance, processing capacity, labour availability, transport limits and continued compatibility with the wider land-management and biodiversity objectives.

3.8.7.2 Poultry Management

Poultry provide eggs, pest control, manure and enterprise diversity. The system is designed around small numbers, mobile housing and rotational use of suitable areas.

Moveable shelters and controlled access to prevent damage to productive beds.
Integration with orchard and pasture areas where appropriate.
Manure and bedding returned through composting.
Predator protection and biosecurity routines.
Egg production for household use and modest local sales where compliant.

3.8.7.3 Beekeeping Enterprise

The apiary supports honey production, pollination and biodiversity education. It is located where bees have access to orchard blossom, meadow, hedgerow and woodland-edge forage while avoiding conflict with neighbours or regular public access routes.

Small number of hives scaled to site capacity and forage availability.
Natural / low-intervention management where compatible with bee health.
Honey extraction and jar storage within the workshop / processing area.
Wax and by-products used where practical.
Records kept for hive health, yield and management actions.

3.9 Conclusion

The Design and Development Strategy sets out a coherent spatial and operational framework for Lower Wych. The dwelling and enterprise core are compact; the food systems are close to the areas that need daily management; the woodland, hedgerows, managed meadow / scrub-grassland mosaic, pond and wetland areas are protected and enhanced; and the energy, water and waste systems are designed to be measurable.

Taken together, these measures show how the proposed development can function as a single land-based OPD system: productive, low-impact, visually contained, reversible and capable of being audited through annual monitoring.

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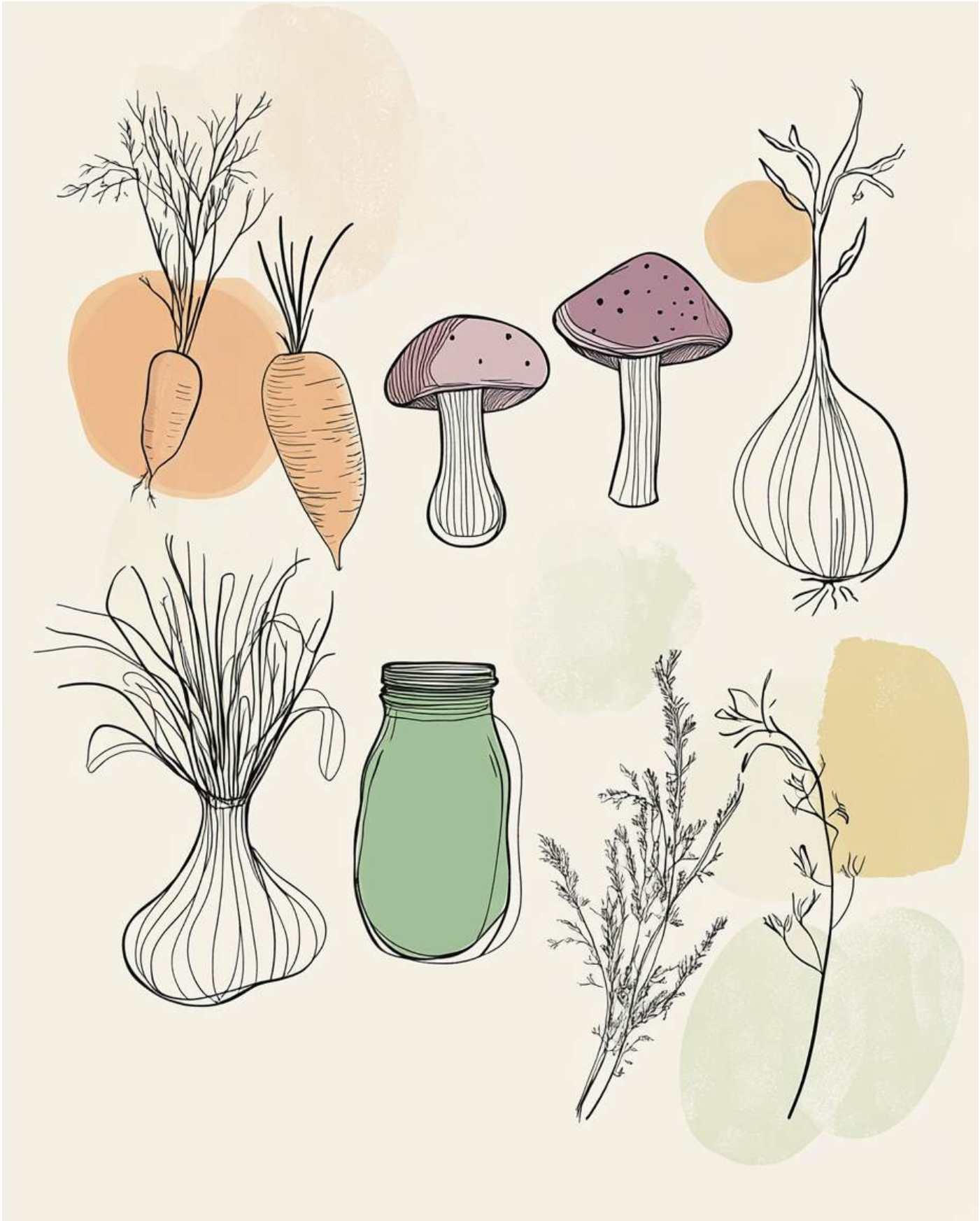
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4.Business & Improvement Plan

4 Business & Improvement Plan

4.1 Minimum Needs Assessment

Minimum Needs Assessment (Year 5)

One Planet Development policy (Technical Advice Note 6) requires that by the fifth year of occupancy the site's land-based activities fully support the basic household needs in terms of food and income. In practice, this means our land-based livelihood must cover all "minimum needs" of the household within five years. We have prepared a robust plan to achieve this for our family of 2 adults and 2 small children.[86]

This Business and Improvement Plan should also be read in the context of the current development-plan position following the quashing of the Wrexham Local Development Plan. The operative planning framework is therefore Future Wales 2040, Planning Policy Wales Edition 12 and the residual Wrexham Unitary Development Plan 1996-2011 policies, including PS1, PS2 and GDP1, alongside TAN 6 and the OPD Practice Guidance. For this chapter, the most relevant TAN 6 requirements are paragraphs 4.17-4.22, including the requirement for residents' minimum needs to be met from the site within five years, and the requirement that occupation is justified by the land-based activities and binding management plan. [86][87][97][98][99]

According to TAN 6 and the One Planet Development Practice Guidance, these minimum needs are defined as the five essential categories that typically require cash income:[86][87]

- **Food not produced on-site (up to 35% of total food)**
- **Clothing**
- **Personal travel**
- **IT/communications**
- **Council Tax**

Our management plan is designed to ensure that by Year 5 the net income from on-site enterprises is sufficient to pay for all five of these mandatory categories in full, making the household effectively self-reliant in basic needs from the land. In addition to the TAN 6 categories, we have also budgeted for a sixth discretionary category - food-production inputs (e.g. seeds, livestock feed, soil amendments) - to transparently account for the ongoing costs of sustaining our food production. Although not explicitly mandated by policy, including this category provides a realistic picture of our annual outgoings and ensures our business plan covers the full costs of living and working on the site.[86][87]

Table 4-1 summarises our expected Year 5 minimum needs, broken down by category. Figures are in 2025 prices, reflecting the most recent publicly available indices. We have assumed no additional inflationary uplift beyond Year 5; cost increases will be offset by parallel increases in produce prices or enterprise scale.

Projected Year 5 Minimum Needs Budget

By Year 5, our household's minimum-needs expenditure is projected to total approximately £6,604 per year (in 2025 price terms). Table 4-1 below breaks down this annual figure across the five mandatory categories and the additional food-production input and contingency allowances. This budget is deliberately modest, but it is not treated as a best-case figure: the food element is stress-tested below against the OPD 65% food self-sufficiency minimum and against the Lower Wych 80% Year-5 target.

We note that this total is in line with existing One Planet Development precedents - for context, a recent review found that OPD households report an average basic-needs expenditure of about £5,164 per year. Our planned £6,604/year is therefore well within the normal range, reflecting a modest household with a frugal, low-impact lifestyle.[89]

[redacted]

Food Self-Sufficiency Stress Test

The minimum-needs budget uses the Lower Wych Year-5 target of approximately 80% food self-sufficiency. For robustness, Table 4-1A also shows the effect of the OPD minimum 65% self-sufficiency scenario. Even if a poor establishment year, illness or extreme weather temporarily reduced home-grown food to the policy minimum, the additional bought-in food requirement would remain well within the core land-based income case set out in Section 4.2.

[redacted]

Methodology and Assumptions

Monetary Values & Inflation: All values use April 2025 price indices (the most recent publicly available). No additional inflationary uplift is included beyond Year 5; any rise in living costs is expected to be offset by commensurate increases in produce prices and/or minor scaling of the land-based enterprise.

[redacted] that the business case still works if a difficult year temporarily requires a higher level of bought-in staples and food.

To calculate this cost, we considered a cautious low-consumption household food budget and then reduced it to re-

flect on-site production. The cash allowance is intended mainly for products that are hard to produce reliably on the holding, such as flour, oats, cooking oil, rice, coffee, tea, salt, spices and occasional supplementary protein or dairy. It does not assume normal supermarket-style purchasing of vegetables, salad crops, fruit, eggs, mushrooms, preserves or seasonal staples that are produced on site.

We consider this a realistic allowance for staples like flour, cooking oil, coffee, etc., and it provides a small buffer in case our home-grown yield falls short in a given season. Notably, some established OPD households have managed to virtually eliminate cash spending on food by producing nearly 100% of their needs on-site. While our aim is to maximise home-grown food, [redacted].

This figure can be revisited as our food self-sufficiency improves; if our gardens and livestock exceed expectations, our actual spending on external food could be lower. Conversely, the budgeted amount gives us flexibility to maintain a healthy diet even in poor harvest years.

[redacted]

[redacted]

We will verify the actual Council Tax band and rate in Year 1 and adjust our budget accordingly, but in all cases this cost must be covered by our land-based income. The inclusion of Council Tax in our minimum needs is explicitly required by TAN 6 and thus non-negotiable - our business plan guarantees that we can pay our Council Tax from earnings on the site, demonstrating we will not be a burden on public finances.

Council Tax will be confirmed by the Valuation Office Agency after completion. If the dwelling is assessed above Band A, the contingency allowance and the enterprise-income surplus provide sufficient headroom to absorb the difference.

[redacted]

The contingency fund can cover unforeseen circumstances such as equipment failures, emergency veterinary costs, or temporary increases in essential expenses. This buffer ensures that our land-based enterprises can reliably meet our household needs even when faced with minor setbacks or cost variations.

Comparison with OPD Precedents

[redacted] extensive on-site food production, low travel demand, repair and reuse, and a dwelling with low running costs. It sits within the range reported by existing OPD households, while the contingency allow-

ance and enterprise-income surplus absorb moderate upward variance. If costs prove materially higher than budgeted, the first response will be to increase on-site production, reduce discretionary travel and non-essential spending, and adjust the annual monitoring return accordingly.

The breakdown of our minimum needs also reflects typical patterns seen in other OPD households, with transport and food representing the largest categories, followed by housing-related costs (Council Tax), communications, and clothing. This consistency with established patterns further validates our approach and demonstrates that our planning is grounded in practical experience rather than theoretical assumptions.

4.2 Enterprises

TYFU - Welsh for *to grow* - is our family's land-based enterprise, built around seven interconnected micro-enterprises that produce healthy, natural and high-quality ingredients grown and made entirely on-site in the Welsh borders. From soil to shelf, every product reflects a zero-waste, low-impact ethos that values regeneration, biodiversity, and connection to place.

The enterprise strategy for the Lower Wych One Planet Development centres on seven complementary land-based activities, but the OPD viability case does not depend on all seven performing strongly. For planning robustness the enterprises are divided into a core minimum-needs case and a secondary/upside case. The core case is deliberately narrower and is sufficient to meet the household minimum-needs requirement by Year 5. Wasabi, honey and micro-dairy add resilience, diversity and upside, but are not required to pass the TAN 6 income test.

The domain tyfu.earth has been secured for the Tyfu enterprise. It will be used as a low-impact online presence for seasonal produce information, pre-arranged customer contact, recipe cards and updates on the Fresh Harvest and Artisan Pantry streams. It is intended to support local produce awareness and customer communication, not to create a general retail destination or unmanaged public access to the holding.

Figure 4-1: Tyfu.earth Homepage Mockup - Produce, Pantry and Landscape Stewardship

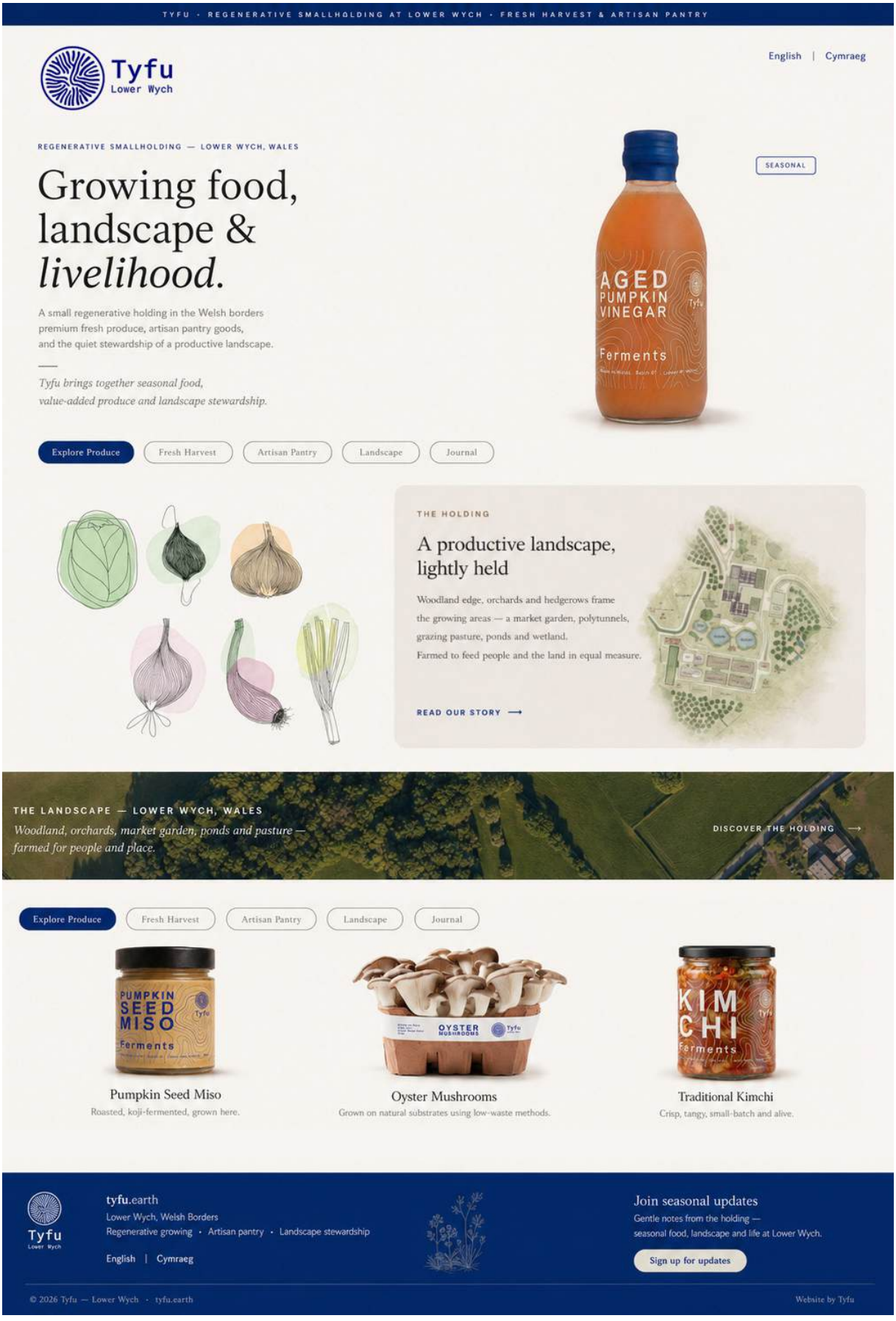


Figure 4-1: Indicative homepage mockup for tyfu.earth, showing how the holding's Fresh Harvest, Artisan Pantry and landscape-stewardship activities could be communicated through a low-impact online presence. The website would support local produce awareness, seasonal updates and pre-arranged customer relationships.

Core Case and Secondary / Upside Case

The core case comprises the enterprises with the shortest establishment period, clear land or building allocation, modest regulatory complexity and realistic Year-5 demand: specialty mushrooms, microgreens, zero-waste ferments and the CSA seasonal vegetable / fruit share. The secondary case comprises wasabi, beekeeping and micro-dairy. They are coherent with the land-management strategy and contribute income, food and biodiversity benefits, but the application is not reliant on them to meet minimum needs.

Table 4-2A: Core and secondary enterprise classi

Enterprise	Role in the financial case	Reason for classification
Specialty mushrooms	Core	Short establishment period; existing skills; indoor/outdoor production; clear local route to market
Microgreens	Core	Fast turnover; small protected-crop footprint; direct local sales; controllable production
Zero-waste vegetable ferments	Core	Adds value to site-grown surplus; long shelf life; food-safety controls are manageable
CSA seasonal vegetable / fruit share	Core	Direct local food contribution; low operating cost; no double-counting of mushrooms, ferments or honey
Core case after central overhead	Core total	Exceeds [redacted] needs without wasabi, honey or micro-dairy after a conservative Year-5 central overhead
Wasabi	Secondary / upside	Specialist crop; retained as low-technology outdoor beds but not load-bearing
Beekeeping / honey	Supporting	Useful pollination and product diversity.
Micro-dairy	Secondary / future only	Not relied upon until training, welfare, registration and market controls are confirmed
Full Year-5 plan	Core + secondary	Equals c. 213% of the £6,604 minimum-needs requirement

Year 5 Enterprise Income Breakdown

Product Specifications

[redacted]

Enterprise Specifications





Price-Sensitivity Analysis

Price-Sensitivity Matrix

The table below demonstrates the resilience of the business plan by showing how variations in yield (±10%) and price (±15%) would affect the overall viability of the enterprise mix. This analysis pre-emptively addresses planning officers' concerns about the robustness of the financial projections

[redacted]

Key Findings from Sensitivity Analysis:

- [redacted]

Enterprise-Specific Sensitivity Analysis



Break-Even Point: The percentage of projected yield required to cover operating costs, assuming baseline prices.

Key Insights:

- **Diversification Benefit**: The diverse enterprise mix provides resilience, as each enterprise has different sensitivity to market and environmental factors.
- **Break-Even Caution:** the break-even figures show operating-cost sensitivity only and should not be read as a guarantee of market demand. The stronger planning test is the dependency test below, which removes the higher-risk secondary enterprises entirely.
- **CSA Advantage**: The CSA model has the lowest break-even point (4%) due to its minimal operating costs and guaranteed sales model.
- **High-Value Crops:** wasabi and mushrooms offer useful upside, but only mushrooms are treated as part of the core minimum-needs case. Wasabi remains a secondary specialist crop.

Enterprise Dependency Test

The table below tests the central planning concern: whether the business can meet minimum needs without relying on the highest-risk or more regulatory-complex enterprises. The answer is yes. The core case of mushrooms, microgreens, ferments and CSA seasonal shares, after a more conservative [redacted] minimum-needs requirement before counting wasabi, honey or micro-dairy.

Table 4-4A: Enterprise dependency test

Scenario	[redacted]	Minimum-needs coverage	Planning interpretation
Full plan		213%	All enterprises including secondary/ upside lines, after conservative Year-5 central overhead
Core case only: mushrooms + microgreens + ferments + CSA, less central overhead		158%	Passes TAN 6 minimum-needs test without wasabi, honey or micro-dairy
No wasabi		189%	Specialist wasabi failure does not threaten viability
No micro-dairy		199%	Dairy can remain secondary without weakening the OPD case
No honey		197%	Poor honey year or colony loss does not threaten viability
No wasabi + no micro-dairy		174%	Higher-risk specialist lines can be absent and the plan still passes

No wasabi + no micro-dairy + no honey	[redacted]	158%	Equals the core case and remains safely above minimum needs

This dependency test is the main reason the seven-enterprise plan should be read as a resilient portfolio rather than a fragile stack of assumptions. The core case is sufficient; the secondary enterprises diversify the household economy and land-management benefits over time.

Conclusion

This sensitivity analysis demonstrates that the proposed enterprise mix is financially robust and can withstand significant variations in both yield and price while still meeting the household's minimum needs requirement.

The full seven-enterprise portfolio therefore provides resilience and upside, while the TAN 6 minimum-needs case rests on the more conservative core case.

4.3 Mushroom Enterprise

The mushroom enterprise provides year-round income through cultivation of specialty mushrooms using agricultural waste and woodland resources available on-site. This enterprise demonstrates circular economy principles by converting waste materials into high-value food products while requiring minimal external inputs.

Enterprise Description and Market Context

The mushroom enterprise focuses on specialty varieties including shiitake, oyster mushrooms and lion's mane that command premium prices in local markets while being well-suited to small-scale production. Production methods include log cultivation using woodland thinnings, shaded outdoor woodchip/ground beds, and a small low-energy indoor fruiting space for year-round reliability.

The UK market for specialty mushrooms continues to grow as consumers seek nutritious, locally-produced alternatives to conventional mushroom varieties. The Lower Wych enterprise aims to capture a portion of this market through direct sales to restaurants, specialty food retailers, farmers markets and integration with the site's CSA subscription box scheme.

Mushroom products

The mushroom enterprise leverages diverse growing methods to produce a comprehensive range of fresh and processed mushroom products. By cultivating multiple varieties using both log and substrate methods, the enterprise ensures year-round production while maximising the value of each harvest through strategic processing and preservation.

Core Product Categories:

- **Fresh Oyster Mushrooms** - Multiple varieties including pearl, king, and phoenix oyster mushrooms harvested at peak freshness. These fast-growing varieties provide consistent weekly harvests and form the backbone of fresh sales.
- **Fresh Shiitake Mushrooms** - Premium log-grown shiitake mushrooms with superior flavour and texture compared to substrate-grown alternatives. These command higher prices due to their traditional cultivation method and exceptional quality.
- **Fresh Lion's Mane Mushrooms** - Distinctive white, cascading mushrooms prized for their seafood-like texture and potential cognitive benefits. These specialty mushrooms appeal to health-conscious consumers and innovative chefs.

Seasonal and Specialty Varieties:

- **Seasonal Wild Varieties** - Carefully cultivated native species including wine cap mushrooms and elm oysters that utilise specific seasonal conditions and local materials.
- **Medicinal Mushroom Varieties** - Small quantities of reishi and other medicinal mushrooms grown primarily for local health food markets and direct sales.

Value-Added Products:

- **Dried Mushroom Products** - Premium dried shiitake, oyster, and lion's mane mushrooms that concentrate

flavours and extend shelf life, appealing to both culinary and health markets.

- **Mushroom Powder** - Finely ground dried mushrooms creating versatile seasoning powders that add umami depth to various dishes while providing convenient storage and transport.
- **Mushroom Salt Blends** - Specialty seasoning blends combining dried mushroom powder with sea salt and herbs, creating unique flavour enhancers for the gourmet market.

Sustainable Production Methods

All mushroom products emphasise sustainable production using agricultural waste and woodland resources. Log cultivation utilises woodland thinnings that would otherwise be waste, while substrate cultivation transforms straw and organic matter into productive growing medium. This circular approach demonstrates how waste materials can be converted into premium food products.

Value Addition Through Processing

Processing capabilities allow the enterprise to capture value from surplus fresh mushrooms while creating shelf-stable products that command premium prices. Dried mushrooms often sell for 8-10 times the price of fresh equivalents by weight, while powders and blends access entirely different market segments. This processing approach ensures minimal waste while maximising income potential from each harvest.

Production System and Infrastructure

Log cultivation utilises oak, ash, and other hardwood logs from woodland management activities, inoculated with mushroom spawn and managed through natural outdoor conditions. This method provides consistent production with minimal ongoing inputs while utilising materials that would otherwise be waste products.

Indoor cultivation systems provide year-round production capacity using agricultural waste including straw, wood chips, and organic matter processed through composting systems. The growing system includes:

- Dedicated fruiting room with humidity control
- Inoculation area for spawn production
- Pasteurisation equipment for substrate preparation
- Basic cold storage for harvested mushrooms

Outdoor wood chip bed cultivation provides additional production capacity using winecap mushrooms (Stropharia rugosoannulata) grown in prepared wood chip beds. These beds utilise fresh wood chips from woodland management activities, creating productive growing areas that last for 3 years before requiring renewal. Winecap mushrooms are particularly well-suited to this method as they thrive in wood chip substrates and provide reliable harvests throughout the growing season while helping to break down organic matter into valuable soil amendments.

These systems allow for reliable harvesting schedules that support consistent market supply throughout the year.

[redacted]

Production Breakdown by Variety

Table 4-6: Production Breakdown by Variety

[redacted]

Operating Costs Breakdown

Table 4-7: Operating Costs Breakdown

Cost Category	Annual Amount (£)
Spawn and growing supplies	Spawn costs eliminated through on-site production from Year 4 onwards*
Substrate materials	[redacted]
Packaging and marketing	[redacted]
Equipment maintenance	[redacted]
Low-energy environmental monitoring / ventilation maintenance	[redacted]
TOTAL	[redacted]

Market Development and Sales Strategy

Market development for mushrooms uses three principal channels:

- Local restaurants (40% of sales): Supply to 5-8 restaurants in Whitchurch, Wrexham, and surrounding areas at wholesale prices
- Farmers markets (30% of sales): Direct retail sales at 2-3 weekly markets
- CSA subscription boxes (30% of sales): Integration with the site's vegetable box scheme

The enterprise emphasises the health benefits and culinary versatility of specialty mushrooms while building customer loyalty through consistent quality and availability. Competitive wholesale pricing at £20/kg average reflects the product's quality while ensuring restaurant profitability.

Integration with Other Enterprises

The mushroom enterprise integrates with other development activities through:

- Utilisation of agricultural waste from vegetable production
- Coordination with composting systems for growing medium preparation
- Spent mushroom substrate becomes valuable soil amendment for other crops
- Inclusion of mushrooms in CSA subscription boxes

Spent growing medium provides valuable organic matter for other agricultural activities.

Viability Assessment

Sensitivity analysis demonstrates the enterprise's resilience:

- Break-even point: approximately 30 kg production, equivalent to 15% of projected Year-5 yield.
- Worst-case scenario (-10% yield, -15% price): still generates approximately [redacted] net income.
- Conservative pricing: [redacted] wholesale is below typical direct-retail prices for specialty mushrooms.

The mushroom enterprise contributes approximately 24.1% of the full Year-5 net land-based income while using

primarily low-value organic materials and a modest dedicated growing area, demonstrating strong resource efficiency and financial viability.

4.4 Microgreens Enterprise

The microgreens enterprise provides year-round income through intensive production of high-value specialty greens that require minimal space and resources while commanding premium prices in local markets. This enterprise demonstrates how small-scale intensive production can generate significant income from limited land area while providing nutrient-dense food products.

Enterprise Description and Market Context

The microgreens enterprise produces a variety of specialty greens including pea shoots, sunflower greens, radish microgreens and specialty herb microgreens using simple protected-cropping benches and small-scale tray systems. Production utilises vertical growing shelves in the polytunnel and/or ancillary growing space to maximise production per square metre without creating a high-energy hydroponic enterprise.

The UK market for microgreens continues to expand as restaurants seek fresh, local ingredients with vibrant flavours and visual appeal, while health-conscious consumers increasingly recognize their exceptional nutritional density. The Lower Wych enterprise aims to capture a portion of this growing market through direct sales to restaurants, specialty retailers, and integration with the site's CSA subscription box scheme.

Microgreens Products

The microgreens enterprise focuses on producing premium, nutrient-dense young plants with rapid turnover and small land take. The system is designed for consistency, hygiene and modest energy use, with seed, water, tray rotation, harvesting and packaging all recorded for annual monitoring.

Core Product Categories

Culinary Microgreens

- **Pea Shoots** - Sweet, tender shoots with bright green colour and crisp texture, popular with restaurants for garnishes and salads. These fast-growing varieties provide reliable weekly harvests.
- **Sunflower Microgreens** - Nutty-flavoured shoots with substantial texture and high nutritional content, appealing to both culinary and health markets for their versatility and visual impact.
- **Radish Microgreens** - Spicy, colourful varieties including red radish and daikon that add heat and visual interest to dishes while providing consistent production throughout the year.

Specialty Herb Microgreens

- **Basil Microgreens** - Intensely flavoured young basil plants in multiple varieties including sweet basil, purple basil, and lemon basil, providing concentrated herb flavours in small packages.
- **Coriander Microgreens** - Young coriander plants with intense flavour and delicate texture, popular with restaurants serving Mexican, Asian, and Middle Eastern cuisines.
- **Rocket Microgreens** - Peppery young rocket plants that provide intense flavour and attractive appearance for high-end salad mixes and garnish applications.

Mixed Microgreen Products

- **Chef's Mix** - Carefully balanced combinations of complementary microgreens designed for specific culinary applications, providing convenience for restaurant customers.
- **Salad Mix** - Consumer-ready combinations of mild microgreens suitable for direct consumption, packaged for retail sale to health-conscious consumers.

Quality and Freshness Standards

All microgreen products emphasise peak freshness and optimal nutritional content through careful timing of harvests and immediate post-harvest handling. Products are harvested at the ideal stage of development when nutritional density peaks, typically 7-14 days after germination depending on variety.

Value Addition Through Specialisation

The microgreens enterprise captures premium prices through specialisation in high-value varieties and consistent quality standards. By focusing on restaurant-quality products and developing relationships with chefs, the enterprise accesses markets willing to pay premium prices for superior products. This approach demonstrates how intensive cultivation methods can generate substantial income from minimal land area.

Production System and Infrastructure

Climate control ensures consistent quality and production schedules. The microgreens infrastructure includes:

- Vertical growing racks with multiple tiers in polytunnel (growing season March-October)
- Climate-controlled growing environment
- Dedicated harvesting and packaging area

The enterprise emphasises organic production methods and premium quality that justifies higher prices than conventional microgreens. All production follows food safety protocols and uses certified organic seeds and growing media.

[redacted]

Production Breakdown by Variety

Table 4-12: Production Breakdown by Variety

Microgreen Variety	Annual Production (kg)	Wholesale Price (£/kg)	Gross Income	[redacted]
Pea shoots	60	£16		
Sunflower shoots	40	£15		
Radish microgreens	30	£18		
Mixed herb microgreens	25	£20		
Specialty varieties	25	£16		
TOTAL	180	£16 average		

Operating Costs Breakdown

Table 4-13: Operating Costs Breakdown

Cost Category	Annual Amount (£)
Seeds	[redacted]
Growing media	[redacted]
Packaging	[redacted]
Equipment	[redacted]
Growing environment management	[redacted]
Irrigation system maintenance	[redacted]

Cost Category	Annual Amount (£)
TOTAL	[redacted]

Market Development and Sales Strategy

Market development for microgreens uses three principal channels:

- Restaurants and caterers (40% of sales): Supply to 6-10 establishments in Wrexham, Whitchurch and surrounding areas
- Specialty food retailers (30% of sales): Health food stores and farm shops
- CSA subscription boxes (30% of sales): Integration with the site's vegetable box scheme

Customer relationship development emphasises consistent quality, reliable supply, and customer education about microgreens' nutritional benefits and culinary applications. The enterprise includes development of branded packaging and marketing materials that emphasise local production, organic methods, and premium quality.

Integration with Other Enterprises

The microgreens enterprise integrates with other development activities through:

- Utilisation of compost from site waste streams
- Coordination with other enterprises for consistent CSA box offerings
- Shared marketing and distribution with other food products
- Use of waste heat from other operations to reduce energy costs

The compact nature of microgreens production allows for efficient use of space within existing structures, minimising the need for additional infrastructure while maximising income per square metre.

OPD Precedent and Viability Assessment

Sensitivity analysis demonstrates the enterprise's resilience:

- Break-even point: 45 kg production (25% of projected yield)
- Worst-case scenario (-10% yield, -15% price): [redacted]
- Conservative pricing: £16/kg average wholesale is below typical direct retail rates of £[redacted]

The microgreens enterprise contributes 15.2% of the total land-based livelihood income while occupying less than 50 square metres of growing space, demonstrating exceptional land-use efficiency and strong financial viability.

4.5 Zero Waste Vegetable Ferments Enterprise

The fermentation enterprise demonstrates zero-waste principles by converting surplus vegetables and agricultural waste into high-value preserved foods that provide year-round income while extending the harvest season and reducing food waste. This enterprise showcases traditional food preservation techniques adapted for contemporary markets while creating additional value from on-site production.

Enterprise Description and Market Context

The fermentation enterprise produces traditional fermented vegetables including sauerkraut, kimchi, pickled vegetables, and specialty ferments using vegetables grown on-site Production methods emphasise traditional techniques, high-quality ingredients, and artisan presentation that commands premium prices.

The UK market for fermented foods has grown significantly in recent years as consumers seek gut-health promoting foods with authentic production methods and local provenance. The Lower Wych enterprise aims to capture a portion of this growing market through direct sales to health food stores, specialty retailers, and integration with the site's CSA subscription box scheme.

Fermented Products

Initial focus will be on establishing 2-3 core recipes with consistent quality and market appeal, gradually expanding to a diverse product range by Year 5. All products are designed with zero-waste principles:

- Fermentation byproducts are repurposed into secondary products

- Pressed pulp is dried into powders for seasoning blends
- Whey from fermented pickles feeds into vinegar starters
- Spent mushroom or koji mash is composted or used as animal feed

This approach aligns perfectly with OPD principles of small-scale, land-based processing: “On-site processing can bring significant benefits…it provides much higher margins on sales…and many waste products can be used as raw materials for other enterprises on-site.”

Signature Product Range

Umami Enhancers:

- **Smoked Mushroom Garum** A protein-rich savory sauce made from oyster-mushroom stems, koji culture and salt, fermented to yield a vegan umami sauce that transforms mushroom waste into a premium culinary ingredient.
- **Rhubarb Tamari** A tart-savory liquid seasoning brewed from pressed rhubarb juice and pea miso, creating a local soy-sauce alternative. This versatile product can be used as a fruity vinegar or even drizzled on desserts, demonstrating exceptional culinary flexibility.

Fermented Vegetables:

- **Kimchi** Whole-leaf cabbage lacto-fermented with daikon, carrot, chilli, garlic, ginger and house-made mushroom shoyu. This vibrant, probiotic staple transforms surplus brassicas into a tangy, chilli-spiked condiment with exceptional shelf life.
- **Nasturtium “Capers”** Pickled seed pods of nasturtiums in brine, creating a hyper-local substitute for imported capers while utilising a part of the plant typically discarded.

Specialty Vinegars:

- **Aged Pumpkin Vinegar** An amber vinegar made by fermenting pumpkin flesh and skin with wild yeast, then ageing it to develop mellow acidity. This product represents a zero-waste use of pumpkin off-cuts that would otherwise be composted.
- **Woodland Vinaigrette** A foraged-herb vinegar dressing infused in house-made cider vinegar - capturing “woodland” flavours in a bottle while showcasing the site’s diverse ecosystem.

Fermented Miso/Pea-so

- **Elderflower Pea-so** A miso-like paste of elderflower, home-grown split peas and barley koji, aged to create a floral seasoning base that combines foraged and cultivated ingredients in an innovative product.
- **Pumpkin-Seed Miso** A rich miso made by culturing roasted waste pumpkin seeds with koji and sea salt, yielding a nutty paste that preserves surplus squash seeds while creating a distinctive flavour enhancer.

Value Addition Through Fermentation

By fermenting and preserving on-site produce, the enterprise prevents waste while adding significant value, turning low-value excess fruit and vegetables into premium artisanal foods with extended shelf life and enhanced nutritional profiles. This strategy demonstrates how thoughtful food craft can yield both environmental sustainability and an economically viable product range.

The fermentation processes employed enhance food security by:

- Extending the seasonal availability of site-grown produce
- Creating shelf-stable products that can be sold year-round
- Developing unique flavour profiles that command premium prices
- Building a distinctive brand identity based on traditional preservation techniques

Production System and Infrastructure

Production facilities include fermentation rooms, stainless steel fermentation vessels, and packaging equipment that meets food safety regulations while maintaining artisan quality. The fermentation infrastructure includes:

- Dedicated food-grade processing area with stainless steel surfaces
- Fermentation chambers

- Glass fermentation vessels in various sizes
- Vacuum sealing equipment for extended shelf life
- Cold storage for finished products

The enterprise includes development of unique recipes and flavour profiles that differentiate products in competitive markets. All production follows HACCP food safety protocols and meets environmental health requirements for commercial food production.

Annual Production and Income Projections

Year 1: Development of production systems, recipe development, and initial market testing. Focus on establishing food safety protocols and regulatory compliance. Income projection: [redacted] from initial product sales. ([redacted] net after operating costs)

Year 2: Expansion of product lines and initial market development with increasing production volumes. Income projection: [redacted] from fermented product sales. ([redacted] net after operating costs)

Year 3: Further expansion of production capacity and market channels. Income projection: [redacted] from diversified fermented products. ([redacted] net after operating costs)

Year 4: Established small-batch production with an expanded fermented-product range and developed local sales channels. Income projection: [redacted] gross income, generating approximately [redacted] net income after [redacted] operating costs

Year 5 (Full Production): Full production capacity with diversified product lines and established market relationships. Income projection: [redacted] gross income ([redacted] net after [redacted] operating costs) from mature fermentation enterprise.

Production Breakdown by Product

Table 4-10: Production Breakdown by Product

Product	Annual Production
Fermented Vegetables	200 jars
Umami Enhancers	150 jars
Miso/Pea-so	200 jars
Specialty Vinegars	100 bottles
TOTAL	650 jars / bottles

[redacted]

Operating Costs Breakdown

Table 4-11: Operating Costs Breakdown

Cost Category	Annual Amount (£)
Ingredients and supplements	
Jars/bottles and packaging	
Food-safe storage / temperature monitoring	
Production area maintenance	
Equipment maintenance	
Regulatory compliance	
TOTAL	

[redacted]

Market Development and Sales Strategy

Market development for fermented products uses three principal channels:

- Health food stores and delicatessens (40% of sales): Supply to 5-8 specialty retailers in Wrexham, Whitchurch, Malpas, Overton and surrounding areas
- Farmers markets (30% of sales): Direct retail sales at 2-3 weekly markets
- CSA subscription boxes (30% of sales): Integration with the site's vegetable box scheme

The enterprise emphasises the health benefits, traditional production methods, and zero-waste credentials of the products while building customer loyalty through consistent quality and innovative flavours. Competitive pricing at £5 per jar average reflects the premium quality while remaining accessible to regular customers.

Integration with Other Enterprises

The fermentation enterprise utilises surplus vegetables from on-site production, agricultural waste that would otherwise be composted, and surplus produce from neighbouring farms that might otherwise be wasted. This integration includes:

- Coordination with vegetable production for optimal harvest timing
- Utilisation of fermentation byproducts for animal feed and composting
- Development of seasonal production schedules that maximise resource utilisation
- Creation of value-added products from seconds and surplus produce

This approach demonstrates circular economy principles while creating additional income streams from materials that would otherwise have disposal costs.

Viability Assessment

Sensitivity analysis demonstrates the enterprise's resilience:

- Break-even point: 150 jars (23% of projected production)
- Worst-case scenario (-10% yield, -15% price): Still generates [redacted] net income
- Conservative pricing: £[redacted]/jar average is below typical farmers market rates of [redacted]/jar

The fermentation enterprise contributes 17.6% of the total land-based livelihood income while utilising primarily waste materials and requiring minimal dedicated space, demonstrating excellent resource efficiency and strong financial viability.

4.6 CSA Subscription Boxes Enterprise

The Community Supported Agriculture (CSA) subscription box enterprise provides a direct connection between production and consumers while creating a stable, predictable income stream throughout the growing season. This enterprise demonstrates the principles of community-supported food systems while integrating the diverse products from across the Lower Wych development into a cohesive market offering.

Enterprise Description and Market Context

The CSA subscription box enterprise delivers weekly boxes of seasonal produce (for half the year) directly to local consumers who commit to supporting the farm through advance subscription. Each box contains a diverse selection of seasonal vegetables and fruits grown on-site, providing members with fresh, local produce while giving the farm a guaranteed market and predictable income.

The UK market for CSA schemes and vegetable box deliveries has grown significantly in recent years as consumers seek connections with local food producers, greater transparency in food systems, and access to fresh, seasonal produce. The Lower Wych enterprise aims to serve the local community within a 10-mile radius through a direct subscription model that builds lasting relationships between producer and consumer.

Subscription box products

The CSA (Community Supported Agriculture) subscription boxes serve as the primary marketing channel for the site's diverse agricultural production, combining seasonal vegetables with specialty products from other enterprises. This approach provides guaranteed income while building strong community relationships and showcasing the full range of on-site production capabilities.

Core Product Categories

Seasonal Vegetable Boxes:

- **Spring Boxes (March-May)** - Early season vegetables including salad greens, radishes, spring onions, and early brassicas, supplemented with stored root vegetables and preserved products from previous seasons.
- **Summer Boxes (June-August)** - Peak season abundance featuring tomatoes, cucumbers, beans, summer

squash, and diverse salad crops, representing the highest value period for fresh vegetable production.
- **Autumn Boxes (September-November)** - Late season harvests including winter squash, root vegetables, late brassicas, and storage crops, often supplemented with preserved and processed products.

Integrated Enterprise Products:

- **Weekly Mushroom Additions** - 100g portions of fresh specialty mushrooms included in each box, providing consistent exposure to premium mushroom varieties while adding significant value to vegetable boxes.
- **Bi-weekly Fermented Products** - Rotating selection of fermented vegetables, kimchi, and specialty preserves that showcase zero-waste principles while adding unique flavours to member boxes.
- **Monthly Honey Inclusions** - 500g jars of seasonal honey included monthly, providing members with year-round access to site-produced honey while generating premium income.

Value-Added Components:

- **Seasonal Recipe Cards** - Custom recipe suggestions featuring box contents and on-site products, educating members about unfamiliar vegetables while promoting additional enterprise products.
- **Preservation Guides** - Instructions for storing, preserving, and processing box contents, helping members maximise value while reducing food waste.
- **Farm Updates** - Regular newsletters describing seasonal activities, enterprise developments, and sustainable farming practices, building community connection and educational value.

Community Engagement Strategy

CSA boxes emphasise relationship building and education rather than simple product delivery. Members receive insight into seasonal farming challenges, sustainable production methods, and the interconnected nature of the various enterprises, creating advocates for the OPD approach.

Seasonal Value Optimization

Box contents vary seasonally to reflect natural production cycles while maintaining consistent value for members. Spring boxes may include more preserved products and early greens, while summer boxes overflow with fresh vegetables. This approach educates members about seasonal eating while ensuring economic viability throughout the growing season.

Integration Benefits

The CSA model provides guaranteed markets for diverse products while reducing marketing costs and building customer loyalty. By including products from multiple enterprises, boxes showcase the site's productivity while providing members with unique products unavailable through conventional retail channels. This integration demonstrates how diversified production can create marketing synergies that benefit all enterprises.

Production System and Infrastructure

The CSA subscription box system integrates production from across the site's growing areas, coordinating planting schedules to ensure consistent weekly harvests throughout the growing season. The CSA infrastructure includes:

- Dedicated harvest and packing area
- Washing and preparation facilities
- Cold storage for harvested produce
- Reusable box system with deposit scheme
- Local delivery route optimisation

The enterprise emphasises ecological growing methods, seasonal eating, and minimal packaging waste through a reusable box system. All production follows organic principles with transparent communication to members about growing methods and seasonal challenges.

Annual Production and Income Projections

Year 1: Initial pilot programme with 5 subscription members for a 16-week season. Focus on systems development and member feedback. Income projection: £800 from initial subscriptions. (£400 net after operating costs)

Year 2: Expansion to 8 members with 20-week season and refined product mix. Income projection: [redacted] from subscription sales. ([redacted] net after operating costs)

Year 3: Further expansion to 10 members with 24-week season and increased product diversity. Income projection: £2,400 from subscription programme. ([redacted] net after operating costs)

Year 4: Growth to 12 members with established systems and consistent quality. Income projection: £2,880 from mature CSA programme. ([redacted] net after operating costs)

Year 5 (Full Production): Full capacity with 15 members for a 24-week season with optimised product mix and established systems. Income projection: [redacted] gross income [redacted] net after [redacted] operating costs) from mature CSA enterprise.

Production Breakdown by Season

Table 4-16: Production Breakdown by Season

Season	Weeks	Box Contents
Spring (May-Jun)	8	Early greens, radishes, herbs, spring onions
Summer (Jul-Aug)	8	Peak season vegetables, soft fruits, herbs
Autumn (Sep-Oct)	8	Root crops, squash, late greens, apples
TOTAL	24	**Seasonal rotation**

Note: The box value varies seasonally, but members pay a consistent [redacted]/week throughout the season, with summer abundance balancing spring scarcity.

Operating Costs Breakdown

Table 4-17: Operating Costs Breakdown

Cost Category	Annual Amount (£)
Seeds and plant starts	[redacted]
Box maintenance	[redacted]
Delivery fuel	£0 (member pickup from farmgate/dedicated locations on weekly supply trip)
Marketing materials	[redacted]
TOTAL	[redacted]

Market Development and Sales Strategy

The CSA model operates on direct relationships with members who commit to supporting the farm through advance subscription. The marketing approach focuses on:

- Community engagement through farm open days and seasonal celebrations
- Transparent communication about growing methods and seasonal challenges
- Member education about seasonal eating and food preparation
- Building personal connections between members and the farm

The enterprise emphasises the value proposition of ultra-fresh produce, connection to the growing process, and supporting local ecological agriculture. The pricing structure of [redacted] per weekly box represents excellent value compared to equivalent organic produce purchased retail while providing the farm with guaranteed sales.

Integration with Other Enterprises

The CSA subscription box enterprise serves as an integration point for multiple enterprises across the site:

- Provides a guaranteed market for seasonal vegetables and fruits
- Incorporates small quantities of specialty products (mushrooms, microgreens)
- Includes occasional value-added products (ferments, honey)
- Creates a direct feedback loop between production and consumption

This integration allows for efficient marketing of diverse products while building a community of supporters who understand and value the whole-farm approach to production.

Viability Assessment

Sensitivity analysis demonstrates the enterprise's exceptional resilience: - Break-even point: 1 box per week (4% of projected production) - Worst-case scenario (-10% yield, -15% price): Still generates [redacted] net income - Conservative pricing: [redacted] is below typical organic box scheme rates of £[redacted]

The CSA subscription box enterprise contributes 24.2% of the total land-based livelihood income while requiring minimal additional infrastructure or operating costs, demonstrating exceptional financial efficiency and strong viability.

The direct marketing approach also builds valuable community connections that support the broader OPD objectives.

4.7 Wasabi Enterprise

Wasabi (Wasabia japonica) cultivation is retained as a specialist secondary enterprise for the Lower Wych development. It combines a shaded woodland-edge microclimate with low-technology gravel / pebble prepared beds and clean harvested-rainwater irrigation. It is not relied upon to meet the TAN 6 minimum-needs income test; the core case works without it. The purpose of retaining the wasabi line is to provide a high-value, small-area crop that can be scaled cautiously. 92][93]

Enterprise Description and Market Context

Real wasabi is a specialty vegetable with significant market value, but it is also a demanding crop. For planning purposes the Lower Wych figure is therefore treated cautiously: [redacted]g is used as an indicative wholesale value for small quantities of fresh rhizome supplied. [92][93]

The UK market for true wasabi is niche and currently served by imports and a small number of specialist producers. Lower Wych would not attempt to become a volume supplier. If the crop performs, sales would be limited to small local or regional restaurant and direct-customer opportunities, with unsold leaf and stem material used as pickles. [92][93]

Wasabi Products

The wasabi enterprise focuses on cautious value creation from a premium crop rather than rapid scaling. The first objective is to establish healthy plants and learn the site-specific microclimate; rhizome sales and small quantities of leaves/stems are secondary to that establishment phase. Value-added products would only be introduced if the crop performs reliably.

Core Product Categories

Fresh Wasabi Products:

- Fresh Wasabi Rhizomes - small quantities of whole rhizomes harvested only once plants are mature, sold fresh to restaurants or specialist customers.
- Wasabi Leaves - occasional leaf harvest for household use, recipe development or very small local sales, only where this does not weaken plant establishment.
- Wasabi Stems - possible secondary use in pickled products or ferments.

Value-Added Products:

- Fresh Wasabi Paste - prepared-to-order product.
- Wasabi Salt - possible shelf-stable product trial.
- Pickled Wasabi Stems - ow-volume value-added product using by-products.

Quality and Authenticity

Any wasabi sales would emphasise authenticity, freshness and traceability rather than volume. Marketing claims would be kept modest and evidence-based.

Value Addition Through Processing

Any on-site processing of wasabi would be small-scale and secondary to fresh sales. The primary planning assumption is simple harvesting, cleaning, refrigeration and direct sale of fresh rhizomes or leaves. More complex products such as paste, salt or pickled stems would be introduced only after the crop has proven reliable. [91]

Production System and Infrastructure

The wasabi production system utilises approximately 100 square metres of low-technology outdoor growing space near the woodland-edge microclimate. The beds will be formed as shallow gravel / pebble prepared beds with organic matter and leaf-mould inputs, shaded by existing landscape structure and supplementary temporary shade only where needed. The system is deliberately simpler than a fully controlled-environment wasabi system and is designed to be reversible.

- Simple drip / seep irrigation from clean harvested rainwater or the clean-water irrigation reserve
- No treated greywater, reedbed effluent or nutrient-rich runoff used on edible wasabi beds
- Seasonal shade management using existing woodland-edge shade, temporary shade cloth or low planting where required

Growing medium consists of gravel, pebbles, leaf mould and low-nutrient organic matter to provide free drainage, cool root conditions and consistent moisture without artificial nutrient loading.

Annual Production and Income Projections

[redacted]

Operating Costs Breakdown

Table 4-5: Operating Costs Breakdown

Cost Category	[redacted]
Growing medium	
Irrigation system maintenance	
Packaging	
Equipment	
TOTAL	

Market Development and Sales Strategy

Market development for wasabi would be cautious and secondary. The first step is to test quality and continuity locally before approaching restaurants or specialist customers. If the crop establishes successfully, the strategy includes:

- Chef education about fresh wasabi quality and culinary applications
- Small pre-agreed supply relationships only where quality and availability are consistent
- Indicative wholesale pricing at [redacted], reviewed against actual quality, labour and market response

Direct sales would remain small and occasional. Packaging and marketing would be simple, and the enterprise would be paused if the crop, labour requirement or market response does not justify continuation.

Integration with Other Enterprises

The wasabi enterprise integrates with other development activities through:

- Utilisation of agricultural waste for growing medium amendments
- Integration with water management systems for irrigation and humidity control
- Coordination with beekeeping enterprise for pollination services during flowering periods

Compost, leaf mould and woodchip residues support the wasabi beds as mulch and soil-structure inputs, but the system does not rely on artificial heating or complex environmental control.

Viability Assessment

The figures below are retained for transparency, but the decisive dependency test is that wasabi can fail entirely without undermining minimum-needs compliance:

- Break-even point: 2.8 kg production (21% of projected yield)
- Failure scenario: if wasabi produces no Year-5 income, the core case still exceeds minimum needs
- Pricing caution: [redacted] is used only as an indicative wholesale value for small fresh-rhizome sales

The wasabi enterprise contributes a potential 11.0% of the full Year-5 land-based income while occupying a small area of the productive land base. Because it is higher risk than mushrooms, ferments, microgreens and CSA shares, it is treated as a secondary enterprise rather than part of the core minimum-needs case.

4.8 Beekeeping Enterprise

The beekeeping enterprise provides multiple income streams while supporting pollination services for other agricultural activities and contributing to local biodiversity conservation. This enterprise demonstrates the integration of productive activities with ecological enhancement objectives while generating sustainable income through honey and related products.

Enterprise Description and Market Context

The beekeeping operation includes 6-8 hives managed using sustainable practices that prioritise bee health and natural behaviour while providing honey, beeswax, and other hive products for local sales. Management approach emphasises minimal intervention, natural comb building, and integrated pest management that avoids chemical treatments.

The UK market for local honey continues to grow as consumers seek authentic, traceable food products with health benefits and environmental credentials. The Lower Wych enterprise aims to capture a portion of this market through direct sales to specialty food retailers, farmers markets, and integration with the site's CSA subscription box scheme.

Bee Products

The beekeeping enterprise maximises the value of bee colonies through diversified product development that utilises all hive products. Starting with honey production as the primary focus, the enterprise could go on to include wax products, propolis, and seasonal specialties that capture the full economic potential of healthy bee colonies.

Core Product Categories

Honey Products:

- **Raw Wildflower Honey** - Unprocessed honey harvested from diverse local flora, sold in 500g jars that preserve the natural enzymes and complex flavours unique to the site's botanical diversity.
- **Seasonal Honey Varieties** - Specialised honey harvests from specific flowering periods, including spring blossom honey, summer meadow honey, each with distinct flavour profiles.
- **Creamed Honey** - Controlled crystallization process creating smooth, spreadable honey that appeals to consumers preferring consistent texture while maintaining all natural properties.

Beeswax Products:

- **Pure Beeswax Blocks** - Raw beeswax sold to crafters, woodworkers, and other beekeepers for various appli-

cations including furniture polish, leather conditioning, and candle making.

- **Beeswax Candles** - Hand-dipped and moulded candles that provide higher value addition than raw wax while appealing to consumers seeking natural, non-toxic lighting options.
- **Beeswax Wraps** - Eco-friendly food storage wraps made from organic cotton infused with beeswax, providing sustainable alternatives to plastic wrap for environmentally conscious consumers.

Specialty Bee Products:

- **Propolis Tincture** - Extracted propolis marketed for its antimicrobial properties and traditional health applications, appealing to natural health enthusiasts.
- **Pollen Supplements** - Carefully harvested bee pollen sold as a nutritional supplement, though production remains secondary to colony health requirements.
- **Nucleus Colonies/Queens** - 4 nucleus colonies or queen bees sold annually at £180 each to local beekeepers, providing essential breeding stock while supporting the local beekeeping community and generating additional income.

Sustainable Harvesting Practices

All bee products emphasise sustainable harvesting that prioritizes colony health over maximum extraction. Honey harvests leave adequate stores for winter survival, while wax and propolis collection occurs only when surplus to colony needs. This approach ensures long-term productivity while maintaining the ethical standards expected by conscious consumers.

Value Addition Through Processing

On-site processing of bee products captures maximum value while ensuring quality control throughout the production chain. Raw honey commands premium prices when sold directly to consumers, while value-added products like candles and wraps access different market segments with higher profit margins. This diversified approach provides income stability while showcasing the versatility of bee colony products.

Production System and Infrastructure

Hive placement utilises multiple locations across the site to provide diverse foraging opportunities while supporting pollination of agricultural crops and wild plants. The beekeeping infrastructure includes:

- 6-8 Langstroth hives with sustainable cedar construction
- Small honey extraction and processing facility
- Basic equipment for beeswax product manufacturing
- Dedicated storage area for equipment and finished products

The operation includes queen rearing activities that provide additional income while supporting genetic diversity and colony health. All hives registered with the National Bee Unit and managed according to best practice guidelines for disease prevention and colony health.

Annual Production and Income Projections

[redacted]

honey.

Production Breakdown by Product

Table 4-8: Production Breakdown by Product

Product	Annual Production	Unit Price	Gross Income
Honey	300 jars (500g each)	[redacted]	[redacted]

Note: the Year-5 honey income projection is retained as a supporting enterprise line. The core business case exceeds minimum needs without relying on honey income.

Operating Costs Breakdown

Table 4-9: Operating Costs Breakdown

Cost Category	Annual Amount (£)
Hive maintenance and equipment	[redacted]
Packaging and labelling	
Disease prevention and treatments	
Marketing and promotion	
Regulatory compliance	
TOTAL	

Market Development and Sales Strategy

Market development for honey and bee products uses three principal channels:

- Direct retail sales (50% of sales): Farmers markets and food festivals
- Specialty food retailers (30% of sales): Local delicatessens and health food stores
- CSA subscription boxes: possible occasional inclusion only if separately accounted for; not double-counted with CSA vegetable/fruit income

The enterprise emphasises the local provenance, environmental benefits, and health properties of raw, unfiltered honey while building customer loyalty through consistent quality and availability. Competitive pricing at £5 per 500g jar reflects the premium quality while remaining accessible to regular customers.

Integration with Other Enterprises

The beekeeping enterprise provides essential pollination services for other agricultural activities through:

- Pollination of wasabi, fruit trees, and vegetable crops
- Supporting wild plant reproduction and biodiversity enhancement
- Monitoring of pollinator populations and habitat management

Integration with habitat enhancement activities includes establishment of pollinator-friendly plantings, management of flowering hedgerows and wildflower areas, and coordination with other land management activities to optimise foraging opportunities throughout the growing season.

Viability Assessment

Sensitivity analysis demonstrates the enterprise's resilience:

[redacted]

The beekeeping enterprise contributes 7.7% of the total land-based livelihood income while providing essential ecosystem services and requiring minimal space, demonstrating excellent resource efficiency and strong financial viability.

4.9 Micro Dairy Enterprise

The micro-dairy enterprise is retained as a secondary/future option rather than a core income assumption. It may provide household milk resilience, manure for composting and limited value-added sales if the welfare, land-capacity, registration and food-safety route is confirmed. The OPD minimum-needs case does not rely on dairy income.

Enterprise Description and Market Context

The micro-dairy option would be based on a small herd, indicatively 2-3 milking does, kept within the 2,810 m² G1 low-input rotational grazing / poultry pasture area and managed at low stocking density. It is a secondary option and is not required to meet the Year-5 minimum-needs test. Activation would depend on training, welfare checks, registration, food-business controls, land capacity, labour capacity and annual monitoring evidence.

The market opportunity is therefore treated cautiously. Any sales would be small-scale, local and subject to the relevant food-business registration, milk hygiene, animal welfare, movement, TB-testing and Environmental Health requirements. Until those controls are confirmed, dairy remains outside the core Year-5 minimum-needs calculation.

Micro Dairy Products

The micro-dairy option is included only as a secondary/future line. Its first purpose would be household milk resilience, grazing/fertility integration and skills development. Any sale of milk or fermented milk products would only occur if welfare, registration, milk-hygiene, processing, storage and Environmental Health requirements are confirmed.

Core Product Categories

Fresh Dairy Products:

- Fresh Goat Milk - milk for household use and, only if legally registered and appropriately processed/lab-tested, limited local sale. Raw milk sale is not assumed as part of the core business case.
- Pasteurised Goat Milk - a potential future product if equipment, registration and food-safety controls justify sale; otherwise milk is used for household consumption and trial processing only.

Fermented Dairy Products:

- Goat Milk Kefir - future fermented milk product.
- Goat Milk Yogurt - household or trial product.

Future Dairy Products

- Fresh Goat Cheese - future value-added product only if the regulatory route, facilities and training are confirmed; not included in the core minimum-needs case.

Quality and Safety Standards

All dairy activity would be governed by animal welfare, milk hygiene, temperature control, cleaning records and food-safety requirements. The plan does not assume informal sale of raw milk or cheese; any sale would follow the appropriate registration and inspection route.

Seasonal Production Considerations

Milk production would follow natural breeding and welfare cycles, with rest periods and low stocking density prioritised over output. This makes the dairy option inherently seasonal and reinforces why it is not treated as a core income source.

Value Addition Through Processing

On-site processing would be limited and compliance-led. The plan does not assume a cheese-making or raw-milk sales business. Small quantities of milk or kefir may provide useful supplementary value if the regulatory route is confirmed.

Production System and Infrastructure

Dairy processing facilities would be introduced if the secondary enterprise is activated. At planning stage this means reserving space and identifying the controls that would be needed, rather than assuming a fully operational cheese-making facility from the outset. The potential micro-dairy infrastructure includes:

- Small milking parlour with basic equipment
- Milk processing area with pasteurisation capability
- Small-scale trial processing equipment only if registration and hygiene controls are confirmed
- Cold storage for finished products
- Fenced grazing areas with rotational management

The enterprise may include development of milk, kefir or simple fresh dairy products, but only where the appropriate food-hygiene, storage and Environmental Health requirements are met. No dairy income is needed for the core OPD viability case.

Annual Production and Income Projections

Year 1: no dairy sales assumed. Focus is on training, animal-husbandry planning, grazing design, shelter/fencing design and confirmation of the regulatory route.

Year 2: no core income assumed. If the enterprise is still pursued, this year is used for infrastructure testing and small-scale household milk trials only.

Year 3: possible introduction of a very small herd. Any income is treated as secondary and is not required for minimum-needs compliance.

Year 4: optional limited sales of milk/kefir products may be trialled if registered and compliant. The indicative full-plan income remains capped and conservative.

[redacted]

Production Breakdown by Product

Table 4-14: Production Breakdown by Product

Product	Annual Production
Potential pasteurised goat milk / household milk equivalent	300 litres if activated
Potential goat milk kefir / simple fermented dairy	300 litres if activated
TOTAL	600 litres if activated

[redacted]

Note: the Year-5 dairy income projection is retained as a potential secondary line only. The core business case exceeds minimum needs without it.

Operating Costs Breakdown

Table 4-15: Operating Costs Breakdown

Cost Category	Annual Amount (£)
Feed	
Veterinary	
Packaging	
Equipment	

[redacted]

Cost Category	Annual Amount (£)
Milking area maintenance	
Milk storage system maintenance	
Registration / compliance allowance	
TOTAL	

Market Development and Sales Strategy

If the micro-dairy option is activated, any market development would be compliance-led, with three possible minor channels:

- Direct consumer sales: only small pre-ordered sales or market sales if legally registered and appropriately processed
- Specialty food retailers: only if food-business registration, labelling, storage and shelf-life controls are confirmed
- CSA subscription boxes: possible occasional inclusion only if lawful and separately accounted for; not double-counted with CSA vegetable/fruit income

If activated, the enterprise would emphasise animal welfare, traceability and compliance rather than scale. Sales would remain local, low-volume and subordinate to the core horticulture, mushroom, microgreens and ferment enterprises.

Integration with Other Enterprises

The micro dairy enterprise integrates with land management through rotational grazing that improves pasture health, provides natural fertilisation, and supports biodiversity enhancement. This integration includes:

- Goats provide vegetation management services in areas difficult to manage through other means
- Utilisation of agricultural waste for animal feed
- Coordination with composting systems for manure management
- Development of value-added products that complement other food enterprises

Goats may provide some vegetation-management benefit, but browsing would be tightly controlled to avoid damage to hedgerows, tree regeneration, woodland edges or species-rich grassland establishment.

Viability Assessment

Sensitivity analysis is retained for transparency, but micro-dairy is not part of the core TAN 6 income test:

- Break-even point: 212 litres production (35% of projected yield)
- Failure scenario: if the micro-dairy is not activated, the core case still exceeds minimum needs
- Pricing caution: [redacted] litre is an indicative value only and no dairy sale is assumed unless compliance is confirmed

The micro-dairy enterprise contributes a potential 6.7% of the full Year-5 land-based income, but because of its regulatory implications it is retained as a secondary enterprise and excluded from the core minimum-needs case.

4.10 Market Analysis

The market analysis provides a planning-stage assessment of demand, competition and routes to market for the Lower Wych enterprises. It is deliberately interpreted alongside the dependency test above: the OPD case is not reliant on every specialist product finding a market immediately, because the core minimum-needs case is built around lower-complexity products with shorter establishment periods.

Regional Market Context and Demographics

The Lower Wych development is positioned within the North Wales and Northwest England market region, providing access to diverse customer segments including urban consumers in Wrexham, Chester, rural communities seeking

local food sources, and tourist markets attracted to authentic local products.

Regional demographics indicate growing demand for specialty foods, organic products, and locally produced items driven by increasing health consciousness, environmental awareness, and interest in supporting local economies. The region's proximity to major urban centres provides access to high-income consumers willing to pay premium prices for quality products.

Mushroom Market Analysis

The UK specialty mushroom market exceeds £50 million annually with strong growth in organic and locally produced varieties. Consumer demand is driven by increasing awareness of mushrooms' health benefits, culinary versatility, and sustainable production methods.

Restaurant markets include establishments serving health-conscious cuisine, vegetarian and vegan restaurants, and fine dining establishments that value unique ingredients. Retail opportunities include health food stores, farmers markets, and direct sales through community supported agriculture programmes.

Competition includes large-scale commercial producers and small-scale local producers, with opportunities for differentiation through specialty varieties, organic production methods, and direct customer relationships. The Lower Wych enterprise can compete effectively through product quality, consistent supply, and local production advantages.

Microgreens Market Potential

The UK microgreens market is estimated at £15-20 million annually with strong growth potential driven by restaurant demand and increasing consumer awareness of microgreens' nutritional benefits. Market segments include high-end restaurants, health-conscious consumers, and specialty food retailers.

Restaurant demand is concentrated in establishments serving health-conscious cuisine, fine dining restaurants that value garnish quality, and establishments emphasising local sourcing and fresh ingredients. Retail opportunities include health food stores, specialty grocers, and direct sales through farmers markets.

Competition includes both large-scale hydroponic producers and small-scale local producers, with opportunities for differentiation through organic production methods, specialty varieties, and consistent quality. The Lower Wych enterprise can compete effectively through product freshness, local production advantages, and direct customer relationships.

Zero Waste Ferments Market Analysis

The UK fermented foods market exceeds £300 million annually with strong growth driven by increasing awareness of fermented foods' health benefits and interest in traditional food preservation methods. Market segments include health-conscious consumers, specialty food enthusiasts, and restaurants serving artisan cuisine.

Distribution opportunities include health food stores, specialty food retailers, farmers markets, and direct sales through community supported agriculture programmes. The market supports premium pricing for artisan products with unique flavours and high-quality ingredients.

Competitive landscape includes both large-scale commercial producers and small-scale artisan producers, with opportunities for differentiation through unique recipes, local ingredients, and artisan production methods. The Lower Wych enterprise can compete effectively through product quality, local production story, and direct customer relationships.

CSA (Community Supported Agriculture) Market Analysis

CSA Market Growth and Demand

The UK Community Supported Agriculture market has experienced significant growth, with over 100 active CSA schemes nationwide and membership increasing by 15-20% annually. This growth is driven by consumer desire for fresh, local produce, direct farmer relationships, and guaranteed seasonal variety that supports sustainable agriculture.

CSA Competitive Landscape

Regional CSA analysis reveals limited competition within the immediate catchment area, with the nearest established schemes located over 28 miles away in Mould. This geographic advantage provides opportunity for market leadership while avoiding direct competition with established operations.

Existing schemes typically charge [redacted] per weekly box for 16-20 week seasons, supporting the Lower Wych pricing strategy of [redacted] per box for 24 weeks. The lower pricing reflects the integrated enterprise model where CSA boxes serve as a marketing channel for diverse on-site production rather than the primary income source.

CSA Value Proposition and Member Benefits

The Lower Wych CSA offers unique value through integration of specialty products unavailable through conventional CSA schemes:

Diverse Product Integration: Weekly boxes may occasionally include mushrooms, ferments or honey as optional add-ons or promotional inclusions, but CSA income in the financial model counts only the vegetable, salad, herb, soft-fruit and orchard component. This avoids double-counting income already attributed to other enterprise lines.

Extended Season: 24-week season (March-November) exceeds typical regional schemes by 4-8 weeks, providing members with longer access to fresh local produce and better value for annual membership fees.

Educational Component: Members receive detailed information about sustainable production methods, One Planet Development principles, and seasonal farming activities, creating educational value that supports member retention and community engagement.

Transparency and Traceability: Direct producer-consumer relationships provide complete transparency about production methods, environmental practices, and food safety standards that exceed conventional retail channels.

Local Route-to-Market Evidence

The immediate market area supports an established premium and provenance-led food economy. Whitchurch, six miles from the site, has two restaurants listed in the 2026 Michelin Guide: Docket Restaurant (No.33) and Wild Shropshire, the latter holding a Michelin Green Star for sustainable, terroir-led cooking built around micro-seasonal local produce. The wider area within the assessed delivery radius supports further independent restaurants, gastropubs, delicatessens and farm shops in surrounding villages, together with the farmers' markets.

These outlets are identified as indicative outreach targets for the first trading seasons for the wasabi, specialty mushroom, microgreen and fermented-produce lines, which are aligned with the daily-changing, provenance-led menus this market segment requires. No reliance is placed on any single outlet, the minimum-needs case is tested against the diversified sales mix set out in this section, not against restaurant sales alone. Deliveries to these outlets would be bundled with existing journeys in accordance with the Travel Plan in Section 11.

Wasabi Market Analysis

The UK market for authentic fresh wasabi is niche, specialised and served by a small number of producers and imports. For that reason the Lower Wych wasabi line is treated as a cautious secondary crop, not as a core income stream.

Restaurant demand is concentrated in high-end establishments serving Japanese cuisine, fusion restaurants, and fine dining establishments that value unique ingredients. Retail demand includes specialty food stores, online sales, and direct sales to culinary enthusiasts willing to pay premium prices for authentic wasabi.

Competitive analysis reveals limited UK production capacity with most competitors focusing on wholesale markets rather than direct sales. The Lower Wych enterprise can differentiate through fresh product quality, local production story, and direct customer relationships that provide higher margins than wholesale distribution.

Beekeeping Market Analysis

The UK honey market exceeds £100 million annually with strong demand for local, raw honey and specialty bee products. Consumer preferences favour local production, sustainable beekeeping practices, and products that support pollinator conservation.

Market segments include health-conscious consumers seeking raw honey's health benefits, specialty food enthusiasts interested in unique honey varieties, and consumers supporting local agriculture and pollinator conservation. Distribution opportunities include health food stores, farmers markets, and direct sales.

Competition includes both large-scale commercial producers and small-scale local beekeepers, with opportunities for differentiation through local production, sustainable practices, and value-added products such as beeswax cosmetics and candles.

Micro Dairy Market Analysis

The artisan dairy market can support small, high-quality local products, but it is also highly regulated. The micro-dairy line is therefore treated as a secondary/future option, subject to training, welfare, registration and Environmental Health requirements, rather than as a core Year-5 income assumption.

Distribution opportunities include specialty food stores, farmers markets, restaurants serving local cuisine, and direct sales through farm visits and online platforms. The market supports premium pricing for high-quality artisan products with unique characteristics and production stories.

Competitive analysis reveals opportunities for small-scale producers who can provide consistent quality, unique products, and direct customer relationships. The Lower Wych enterprise can compete effectively through product quality, animal welfare standards, and local production advantages.

Integrated Market Synergies and Efficiency

Many of the target markets for the seven TYFU enterprises overlap substantially, creating significant efficiencies in marketing, logistics and customer engagement. The same core customer groups, including health-conscious households, local restaurants, farm shop buyers and CSA members, value the shared qualities of freshness, provenance and ecological integrity across all products. This overlap allows joint branding, combined deliveries and consolidated communications, reducing time and fuel costs while strengthening customer loyalty through a unified identity.

For instance, a restaurant or market customer purchasing mushrooms may also buy ferments or honey, while CSA members may purchase specialist products as add-ons. These synergies reduce marketing time and delivery miles, but the accounting remains separate so that income is not counted twice.

Market Entry and Development Strategies

Community Supported Agriculture Strategy

CSA development provides the foundation for market entry across all enterprises by establishing direct customer relationships and guaranteed sales volumes. The strategy emphasises community building, customer education, and seasonal engagement that creates loyal customer base for all products.

Phase 1 (Years 1-2): Establish core CSA membership of 5-8 families through local outreach, social media marketing, and participation in community events. Focus on relationship building and product quality that supports membership growth through word-of-mouth referrals.

Phase 2 (Years 3-4): Expand membership to 10-12 families while introducing specialty products and value-added items that demonstrate the full range of on-site production. Develop member feedback systems that guide product development and enterprise expansion.

Phase 3 (Year 5+): Achieve target membership of 15 families while maintaining waiting list that supports future expansion. Establish CSA as the primary marketing channel for integrated enterprise products while supporting premium pricing through member loyalty.

Direct Sales Strategy

Direct sales provide highest margins and strongest customer relationships through farmers markets, farm gate sales and community supported agriculture programmes. This strategy emphasises customer education, product quality, and personal relationships that support premium pricing.

Direct sales development includes participation in local farmers markets, development of on-farm sales facilities, creation of online platforms (providing blogs, recipe ideas, short videos of growing and processing), and establishment of community supported agriculture programmes that provide guaranteed sales and customer loyalty.

Restaurant and Foodservice Strategy

Restaurant sales provide consistent volume and professional validation of product quality while supporting premium pricing for specialty ingredients. Strategy includes relationship building with chefs, consistent supply arrangements, and product education that demonstrates culinary applications.

Restaurant market development includes targeted outreach to establishments serving appropriate cuisine types, development of chef relationships through tastings and demonstrations, and establishment of supply agreements that provide consistent volume and pricing.

Retail Partnership Strategy

Retail partnerships provide broader market access and volume sales while requiring less direct marketing effort. Strategy includes relationships with specialty food stores, health food retailers, and independent grocers that value local products and artisan quality.

Retail partnership development includes product placement in appropriate retail channels, development of attractive packaging and marketing materials, and establishment of wholesale pricing that maintains profitability while providing retailer margins.

Online Strategy

Online provides access direct customer relationships while supporting premium pricing for specialty products. Strategy includes development of professional platforms, social media marketing, and content marketing that educates customers about products and production methods.

Online development includes creation of professional website, development of social media presence and content marketing.

Competitive Advantages and Market Positioning

Quality and Freshness Advantages

Local production provides significant advantages in product freshness, quality control, and customer relationships that support premium pricing and customer loyalty. The Lower Wych enterprises can leverage these advantages through emphasis on harvest-to-customer timing, quality control throughout production, and direct customer relationships.

Sustainability and Local Production Story

Consumer interest in sustainability and local production provides marketing advantages for enterprises that can demonstrate environmental benefits, local economic impact, and sustainable production methods. The One Planet Development context provides unique marketing story that differentiates from conventional producers.

Product Differentiation and Innovation

Specialty products and unique varieties provide opportunities for market differentiation and premium pricing. The Lower Wych enterprises can develop unique products, specialty varieties, and innovative production methods that create competitive advantages and customer loyalty.

Customer Relationship and Service Advantages

Direct customer relationships provide opportunities for superior customer service, product education, and customer loyalty that support premium pricing and repeat sales. Small-scale production enables personalised service and customer relationships that large-scale producers cannot match.

Integrated Enterprise Synergies

The combination of diverse enterprises creates unique market positioning through integrated product offerings unavailable from single-enterprise competitors. CSA members receive access to specialty mushrooms, fermented products, honey, and artisan dairy products alongside seasonal vegetables, creating exceptional value proposition that supports member retention and premium pricing.

Market Risk Assessment and Mitigation

Demand Risk Mitigation

Diversified product portfolio and multiple sales channels reduce dependence on any single market segment while providing flexibility to respond to changing consumer preferences. CSA model provides guaranteed sales base that supports enterprise stability during market fluctuations.

Competition Risk Management

Focus on direct customer relationships and specialty products creates competitive advantages that are difficult for large-scale producers to replicate. Continuous product development and quality improvement maintain competitive positioning while building customer loyalty.

Seasonal Risk Adaptation

Extended growing season and value-added products provide income stability throughout the year while reducing dependence on peak season sales. Storage and preservation capabilities extend product availability and smooth seasonal income variations.

The market analysis demonstrates viable markets for all proposed enterprises while identifying specific strategies for successful market entry and development. The analysis supports the business plan's income projections and provides foundation for marketing and sales activities that will ensure enterprise success. The integration of Community Supported Agriculture as a primary marketing channel creates unique competitive advantages while providing guaranteed sales base that supports all enterprise development.

4.11 Risk Assessment & Contingency Plans

The comprehensive risk assessment identifies potential threats to the Lower Wych One Planet Development's success while establishing robust contingency plans that ensure continued operation and progress. This assessment follows established risk management methodologies while addressing the specific vulnerabilities and opportunities associated with One Planet Development.

Risk Assessment Methodology and Framework

The risk assessment utilises a systematic approach that identifies potential risks across all aspects of the development, assesses their probability and potential impact, and develops appropriate mitigation and contingency strategies. Risks are categorised into environmental, economic, technical, social, and regulatory categories to ensure comprehensive coverage.

Risk assessment includes both quantitative analysis where data is available and qualitative assessment based on judgment and comparable case studies. The assessment considers both acute risks that could cause immediate disruption and chronic risks that could undermine long-term sustainability and success.

Environmental and Climate Risks

Extreme Weather Events:

Climate change increases the frequency and severity of extreme weather events including flooding, drought, severe storms, and temperature extremes that could damage infrastructure, destroy crops, and disrupt operations. Probability assessment indicates increasing likelihood of extreme events based on climate projections.

- **Mitigation Strategies:** Infrastructure design incorporates climate resilience including elevated electrical systems, robust building construction, and drainage systems designed for extreme rainfall events. Agricultural systems include drought-resistant varieties, water storage capacity, and protected growing environments that provide resilience against weather extremes.
- **Contingency Plans:** Emergency response protocols include backup power systems, emergency food and water supplies, and communication systems that function during infrastructure disruptions. Insurance coverage includes comprehensive property protection and business interruption coverage that provides financial resilience.

Pest and Disease Outbreaks:

Agricultural operations face risks from plant diseases, insect pests, and animal health issues that could significantly reduce productivity and income. Specialty crops like wasabi are particularly vulnerable to specific pathogens and environmental stresses.

- **Mitigation Strategies:** Integrated pest management emphasises prevention through healthy soil, crop diversity, beneficial insect habitat, and organic management practices that build natural resistance. Quarantine protocols prevent introduction of new pests and diseases, while monitoring systems enable early detection and rapid response.
- **Contingency Plans:** Emergency response protocols include alternative crop varieties, backup production systems, and financial reserves to cover income losses during recovery periods. Veterinary relationships and animal health protocols provide rapid response to livestock health issues.

Soil Degradation and Contamination:

Intensive agricultural production risks soil degradation through erosion, nutrient depletion, or contamination that

could reduce long-term productivity. External contamination from neighbouring properties or atmospheric deposition could also impact soil quality.

- **Mitigation Strategies:** Regenerative agriculture practices including cover cropping, composting, and rotational grazing build soil health and resilience. Regular soil testing monitors soil quality and enables early detection of problems. Organic certification standards prevent use of harmful chemicals.
- **Contingency Plans:** Soil remediation protocols include organic matter addition that can restore degraded soils. Alternative growing systems including raised beds and container growing can provide backup production capacity.

Economic and Market Risks

Market Price Volatility:

Specialty crop markets can experience significant price volatility due to supply fluctuations, changing consumer preferences, and economic conditions. Premium products are particularly vulnerable to economic downturns that reduce consumer spending on luxury items.

- **Mitigation Strategies:** Enterprise diversification across multiple products and market segments reduces vulnerability to any single market disruption. Long-term customer relationships and contract sales provide price stability and guaranteed markets. Value-added processing creates additional revenue streams and price premiums.

- **Contingency Plans:** Financial reserves provide buffer against temporary income reductions while markets recover. Alternative market channels including direct sales, and wholesale markets provide flexibility during market disruptions. Product diversification enables shifting production toward more stable markets.

Supply Chain Disruptions:

External supply chains for seeds, equipment, packaging, and other inputs could be disrupted by economic conditions, transportation problems, or supplier business failures. Specialty inputs for unique crops may have limited supplier options.

- **Mitigation Strategies:** Local sourcing reduces dependence on distant suppliers while supporting local economy. Inventory management maintains adequate supplies of critical inputs. Multiple supplier relationships provide alternatives when primary suppliers face problems.

- **Contingency Plans:** Emergency supplier networks include backup sources for critical inputs. On-site production of seeds, compost, and other inputs reduces external dependencies. Community networks enable resource sharing during supply disruptions.

Technical and Infrastructure Risks

Renewable Energy System Failures:

Solar panels, battery storage, pumps, inverters and water-treatment equipment could fail due to defects, weather damage or normal wear, potentially disrupting production and requiring repairs or replacement. The proposal does not rely on undeclared wind turbines or fossil-fuel generators as part of the planning case.

- **Mitigation Strategies:** Quality equipment selection emphasises proven reliability and comprehensive warranties. Regular maintenance and monitoring enable early detection of problems. Backup systems provide alternative power sources during equipment failures.

- **Contingency Plans:** resilience is provided through the adopted approximately 20.9 kWp roof-mounted PV array, 50 kWh nominal battery bank, critical-load separation, thermal storage, demand management and the room-sealed resilience boiler stove described in Section 6. Portable solar charging may be used for minor tools, but no permanent backup generator is proposed as part of this application.

Water System Failures:

Storage tanks, and distribution systems could fail due to equipment problems, contamination, or extreme weather, potentially disrupting water supply for both household and agricultural use.

- **Mitigation Strategies:** the approved design basis is rainwater harvesting, 40,000 L potable storage, clean-water irrigation reserve / attenuation ponds, polytunnel catchment and water-efficient fixtures as set out in

Section 6 and Appendix J.1. A borehole ia a drought contingency only and would be pursued separately if required by drought evidence, regulatory advice and any necessary consent.

- **Contingency Plans:** Emergency water supplies include stored water and alternative sources. Backup pumping systems and portable equipment enable continued water access during equipment failures. Water treatment systems provide backup purification capacity.

Social and Community Risks

Community Opposition:

Local opposition to the development could create ongoing conflicts, regulatory challenges, and social isolation that undermines the project's community integration objectives and long-term sustainability.

- **Mitigation Strategies:** Proactive community engagement includes regular communication, transparent operations, and community benefit programmes that demonstrate positive local impacts. Participation in local organisations and events builds relationships and understanding.
- **Contingency Plans:** Conflict resolution protocols include mediation services and community dialogue processes.

Health Risks

Operator Health and Disability:

The development depends heavily on the operators' health and ability to perform physical work. Illness, injury, or disability could significantly impact operations and income generation.

- **Mitigation Strategies:** Health and safety protocols minimise injury risks and promote good health. Diversified skills development reduces dependence on any single person. Health insurance and disability insurance provide financial protection.
- **Contingency Plans:** Backup management arrangements include family members, partner, or hired managers who can maintain operations during health problems. Simplified systems enable continued operation with reduced capacity. Community support networks can provide assistance during health emergencies.

4.12 Financial Sustainability & Cash Flow

The financial sustainability analysis demonstrates the Lower Wych One Planet Development's capacity to generate sufficient income from land-based activities while maintaining positive cash flow and building long-term financial resilience. This analysis provides detailed financial projections, cash flow modelling, and sensitivity analysis that support the development's viability and compliance with TAN6 requirements.

Capital Expenditure and Funding Control

The financial projections below cover annual operating income and costs. Capital items are treated separately so that one-off construction and infrastructure expenditure is not confused with the Year-5 minimum-needs test. The dwelling, water, energy and access infrastructure are part of the planning-stage development cost and are not assumed to be paid for from Year-5 enterprise profit. Enterprise capital expenditure is staged and kept proportionate to the core case before secondary enterprises are activated.

Table 4-17A: Capital expenditure and funding control

Capital item	Timing	Control / funding approach	Relationship to business case
Dwelling and building shell	Pre-occupation / Year 1	Applicant capital / self-build route; separate from annual enterprise profit	Not counted as minimum-needs expenditure
PV, battery, water tanks and core services	Pre-occupation / Year 1	Installed as part of development infrastructure	Supports low running costs but is not funded from Year-5 income
Polytunnels, beds and irrigation header storage	Years 1-2	Staged; prioritised for core vegetable, microgreen and CSA production	Supports core case

Mushroom room / outdoor logs	Years 1-3	Small-scale equipment first; expansion only from sales evidence	Supports core case
Fermentation equipment	Years 1-3	Food-safe small-batch equipment; scaled after tested demand	Supports core case
Wasabi beds	Years 1-4	Low-cost, reversible gravel / pebble beds only	Secondary/upside; no reliance if underperforms
Micro-dairy infrastructure	Year 3+ only if activated	Subject to training, welfare, registration, Environmental Health and labour capacity; otherwise deferred	Secondary/future only; excluded from core case

Financial Planning Framework and Assumptions

Years 1-2 Transitional Cash-Flow Position

The TAN 6 minimum-needs test is a Year-5 test. The cash-flow trajectory shows land-based income below the current Year-5 minimum-needs figure during Years 1 and 2 while production systems, sales channels, orchard and perennial crops, and food-processing routines are established. By Year 3, projected net land-based income rises to approximately [redacted], above the current [redacted] minimum-needs benchmark. During this establishment period, the household will meet any gap between early-stage land-based income and household minimum needs through existing household capital, accumulated savings / proceeds from the previous home and, where required, limited transitional remote professional work. Any such work will be scheduled around the core land-based duties, active management requirements and sole-residence commitment of the Management Plan, and will reduce as enterprise income increases. It is not relied upon for the Year-5 TAN 6 minimum-needs test. By Year 5, the core land-based enterprises alone generate approximately [redacted] net income, and the full plan generates approximately [redacted] net income, both comfortably above the [redacted] minimum-needs requirement.

Business Structure, Tax and Record-Keeping

The enterprises will initially be operated as a small unincorporated family business / sole-trader or partnership arrangement, with annual accounts maintained for OPD monitoring and HMRC self-assessment purposes. Projected Year-5 turnover is well below the current VAT registration threshold of [redacted] turnover, and most food products are zero-rated for VAT in any event. Income Tax and National Insurance treatment will be confirmed annually through self-assessment; the projected Year-5 profit remains modest and within the low-income character of the OPD model. Professional accountancy advice will be taken if the enterprise structure, turnover or tax position changes materially. [100][101][102]

The financial analysis utilises conservative assumptions based on market research, comparable operations to ensure realistic projections that can be achieved under normal operating conditions. The analysis includes both optimistic and pessimistic scenarios to demonstrate resilience under various conditions.

Key assumptions include gradual enterprise development over five years, conservative yield and price estimates based on current market conditions, realistic cost projections including appropriate contingency reserves.

Revenue Projections by Enterprise

Year 1 Revenue Projections: £3,600

Initial revenue comes from the quickest-return core enterprises: mushroom cultivation ([redacted]), fermented foods [redacted], microgreens ([redacted]), CSA seasonal shares ([redacted]) and limited honey / supporting sales ([redacted]), with any micro-dairy income excluded from the core Year-1 assumption. These enterprises can generate income quickly while longer-term secondary enterprises develop.

Year 2 Revenue Projections: [redacted]

Expanding revenue includes mushroom cultivation ([redacted]), beekeeping/supporting honey sales ([redacted]), fermented foods ([redacted]), microgreens ([redacted]) and CSA boxes ([redacted]), with micro-dairy still treated as optional secondary income rather than required core income.

Year 3 Revenue Projections: [redacted]

Maturing enterprises generate wasabi trial income ([redacted], mushroom cultivation ([redacted]), beekeeping ([redacted]0), fermented foods ([redacted]), microgreens ([redacted]) and CSA boxes ([redacted]). Any micro-dairy income in Year 3 is treated as secondary and is not necessary for minimum-needs compliance.

Year 4 Revenue Projections: [redacted]

Near-mature enterprises include wasabi ([redacted]), mushrooms ([redacted]), beekeeping ([redacted]), fermented foods ([redacted]), microgreens ([redacted] and CSA boxes ([redacted]), with micro-dairy retained as a possible secondary line only if registration controls have been confirmed.

Year 5 Revenue Projections: [redacted]

Full production capacity generates the following enterprise income:

Specialty Mushrooms: [redacted] gross income from 200 kg annual production at [redacted] kg average price. Production includes oyster mushrooms (100 kg), shiitake (60 kg), lion's mane (30 kg), and seasonal varieties (10 kg) using a mix of outdoor logs, shaded woodchip beds and a small low-energy indoor fruiting space rather than a large high-energy controlled-environment unit.

Microgreens: [redacted] gross income from 180 kg annual production at [redacted]/kg average price. Production focuses on high-value varieties including pea shoots, sunflower microgreens, radish varieties, and specialty herb microgreens for restaurant and direct sales markets.

Zero Waste Ferments: [redacted] gross income from 650 jars annual production at £5/jar average price. Products include kimchi, vinegars, pickled vegetables, and specialty fermented products utilising on-site produce and agricultural waste.

CSA Subscription Boxes: [redacted] gross income from 15 weekly seasonal vegetable / fruit shares over a 24-week season at £[redacted]/box. The CSA income line counts only the vegetable, salad, herb, soft-fruit and orchard component; mushrooms, ferments, honey and any dairy are accounted for separately and are not double-counted.

Wasabi Enterprise: [redacted] gross income from 13.5 kg mature rhizome equivalent at [redacted]/kg wholesale price. This is secondary/upside income from low-technology outdoor beds and is not required for the core minimum-needs case.

Beekeeping Products: [redacted] gross income from 300 jars (500g each) at [redacted]/jar average price. Production includes raw wildflower honey, seasonal varieties.

Micro Dairy: [redacted] potential gross income from 600 litres total production (milk/kefir equivalent) at [redacted]/litre average price, only if activated and compliant. This is excluded from the core minimum-needs case.

Total Gross Income: [redacted] in the full Year-5 plan. The core case, excluding wasabi, honey and micro-dairy and deducting a conservative Year-5 central overhead, still generates [redacted] net income, which is sufficient to meet minimum needs.

[redacted]





General Farm Operations ( ):

- **Insurance:** (public / product liability, smallholding cover and crop / equipment allowance)
- **Professional Services:** (accounting, annual return support and occasional technical advice)
  General Equipment, Maintenance and Contingency: (minor repairs, replacement consumables and small compliance adjustments)

Total Operating Costs: , representing 24.9% of gross income. This includes a more conservative Year-5 central overhead for insurance, public / product liability, accounting and maintenance. The core minimum-needs case is still tested separately so the OPD case is not dependent on wasabi, honey or micro-dairy.

Cash Flow Analysis and Projections

Year 1 Cash Flow: Net Income

Initial operations generate gross income with operating costs, resulting in net income. This modest positive operating position provides a foundation for continued enterprise development while the principal production and sales systems are established.

Year 2 Cash Flow: Net Income

Increasing production generates gross income with operating costs, resulting in net income. Revenue growth reflects the expansion of the core mushroom, ferment, microgreen and CSA enterprises while secondary enterprises remain non-essential to the minimum-needs case.

Year 3 Cash Flow: Net Income

As the enterprises mature, £ gross income with operating costs generates net income. This moves projected land-based income above the current minimum-needs benchmark, while allowing continued investment in enterprise development and resilience.

Year 4 Cash Flow: Net Income

Near-mature operations generate gross income with operating costs, resulting in net income. This provides a substantial margin above minimum needs while maintaining the enterprises at a modest and manageable scale.

Year 5 Cash Flow: Net Income

Cash flow provides financial security with gross income and operating costs generating net income. This represents approximately 213% of minimum-needs requirements, while the core case alone represents approximately 158% of minimum needs. This provides a substantial margin for equipment replacement, poor seasons and long-term sustainability.

Price-Sensitivity Matrix:

[redacted]

Financial Resilience and Risk Management

Emergency Reserves

Financial planning maintains emergency reserves equivalent to approximately six months of Year-5 operating costs (c. [redacted]), providing buffer against temporary income disruptions and unexpected expenses. Reserves are built gradually from Year 3 onwards at [redacted] annually and maintained in liquid form to ensure availability.

Diversification Strategy

Revenue diversification is structured around four core enterprises, with secondary/supporting lines added only where they are performing and manageable. This avoids reliance on every enterprise succeeding and allows wasabi, honey or micro-dairy to be paused without threatening the TAN 6 minimum-needs case.

Income Enhancement

Market development and product innovation provide opportunities for income enhancement beyond the core case, but expansion will be evidence-led. Higher-risk or more regulated products will be scaled only where production records, customer demand, labour capacity and compliance controls support them.

Long-term Financial Sustainability

Reinvestment Strategy

Positive cash flows are first used for maintenance, equipment replacement, contingency reserves and modest upgrades to the approved systems. Additional permanent infrastructure or materially larger energy/growing systems would be pursued only where compatible with the planning permission and any necessary further consents.

Compliance with TAN6 Financial Requirements

The comprehensive financial analysis demonstrates compliance with TAN6 requirements:

Minimum Needs Achievement: the full development plan achieves approximately 213% of minimum-needs coverage by Year 5 ([redacted] net income vs [redacted] 4 requirement). The core case alone, excluding wasabi, honey and micro-dairy, achieves approximately 158% coverage [redacted]).

Land-Based Income: the OPD minimum-needs calculation relies only on on-site land-based activities. Any off-site professional income is excluded from the viability test and is not needed to meet TAN 6 minimum needs.

Financial Viability: Progressive net income development from [redacted] Year 1 to £[redacted] in Year 5 demonstrates positive operating cash flow from the establishment year onward, with projected land-based income exceeding the current minimum-needs benchmark from Year 3 and achieving substantial headroom by Year 5.

Conservative Projections: All projections are based on market data, and conservative assumptions that ensure achievable targets under normal operating conditions.

Risk Management: comprehensive sensitivity analysis demonstrates resilience under various scenarios, with even the full-plan worst-case projection achieving approximately 146.5% of minimum-needs coverage after the more conservative Year-5 overhead allowance, and the core-case dependency test remaining above the TAN 6 threshold.

Long-term Sustainability: Reinvestment strategies ensure continued viability and growth beyond the initial five-year

period.

The comprehensive financial analysis demonstrates strong financial sustainability with conservative projections showing financial performance that exceeds TAN6 requirements. The analysis includes appropriate risk management and contingency planning that ensures continued viability under various scenarios while supporting the development's long-term objectives and community integration goals. The diversified enterprise portfolio, progressive development timeline, and integrated systems approach create a robust financial foundation that provides security, growth potential, and compliance with One Planet Development principles.

4.13 Workforce & Skills Development

Current Skills Assessment



[redacted]

- Microgreens: Philip's existing production experience

Skills Development Strategy

To address identified gaps, we seek to:

- Gain training in dairy goat management before any micro-dairy activity is activated; dairy is secondary/future and not relied upon for the core minimum-needs case
- Networking with established OPD practitioners through CSA Network UK and One Planet Council

[redacted]

This skills profile demonstrates that the applicants have the necessary experience and capabilities to implement the core land-based enterprises while continuing to develop specialised expertise in secondary areas. The main identified gap is micro-dairy husbandry/regulatory experience, which is why dairy is treated as a future secondary option rather than a core Year-5 income assumption.

4.14 Seasonal Labour Plan

Overview

The household labour strategy has been designed to align with the seasonal rhythm of the land-based enterprises while ensuring adequate labour availability throughout the year. The two adults in the household share responsibility for core site operations, with labour allocation varying seasonally to reflect the demands of horticulture, mushrooms, ferments, CSA preparation, woodland/grassland management, water systems, waste systems and monitoring.

For the purposes of the OPD Management Plan, off-site professional income is excluded from the minimum-needs and labour-viability case. The plan assumes that both adults provide the labour needed for the core land-based enterprises and site management. Any occasional professional work would be supplementary household resilience only and is not used to pass the TAN 6 test.

During late spring, summer and autumn, when agricultural activity peaks, labour is concentrated on propagation, crop care, irrigation, harvesting, processing, CSA preparation, delivery bundling and habitat management. During winter, the workload shifts toward woodland/coppice work, maintenance, accounts, marketing, training, crop planning and monitoring records.

Philip manages the land-based enterprises year round, with particular focus on production planning, infrastructure development, marketing and coordination of all on-site activities. During the peak summer season both adults work

full time on the site. This flexible approach ensures that labour input matches the cyclical workload of the enterprises while maintaining a sustainable work-life balance.

Together, this seasonal labour plan provides consistent year-round management of the site and full labour coverage during high-demand periods. It also identifies which tasks are essential and which secondary activities can be paused if there is illness, a poor season or temporary one-adult availability.

Responsibilities throughout the year

Table 4-18: Responsibilities throughout the year

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beekeeping												
Check water, waste and solar systems												
Wasabi cultivation												
Mushroom production												
Microgreens growing												
Fermentation workshop												
Composting toilet management												
Coppicing												
Firewood management												
Food harvest and storage												
Vegetable growing												
Hedge maintenance												
Mulch perennials												
Mushroom log preparation												
Small livestock management												

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pruning												
Sales/business admin												
Security												
Water polytunnels												
Weeding												
Wetland management												
Subscription box preparation												

Typical working day examples

Table 4-19: Example of typical working day at different times of year

[redacted]

[redacted]

Comprehensive Seasonal Labour Allocation

Table 4-20: Comprehensive Seasonal Labour Allocation

Enterprise	Spring (Mar-May)	Summer (Jun-Aug)	Autumn (Sep-Nov)	Winter (Dec-Feb)	[redacted]	Key Tasks
Mushrooms	6 hrs	6 hrs	8 hrs	5 hrs		Inoculation, cultivation, harvesting
Microgreens	4 hrs	4 hrs	4 hrs	0 hrs		Seeding, harvesting (Mar-Oct)
Ferments	3 hrs	4 hrs	8 hrs	4 hrs		Processing, bottling, monitoring
CSA Boxes	6 hrs	8 hrs	8 hrs	0 hrs		Garden, harvest, box prep
Wasabi	1 hr	2 hrs	3 hrs	1 hr		Low-tech bed checks, shade, moisture and harvest; secondary
Beekeeping	4 hrs	3 hrs	2 hrs	1 hr		Inspections, harvest, maintenance
Micro-dairy (if activated)	0 core hrs; optional 2-6 hrs if activated	0 core hrs; optional 2-6 hrs if activated	0 core hrs; optional 2-6 hrs if activated	0 core hrs; optional 2-6 hrs if activated		Only if training/compli-ance/welfare capacity confirmed; not core
Subsistence	8 hrs	8 hrs	4 hrs	3 hrs		Growing, preserving, planning
Business Ops	4 hrs	7 hrs	3 hrs	8 hrs		Admin, marketing, de-liveries
TOTAL	c. 38 core hrs + optional dairy if activated	c. 44 core hrs + optional dairy if activated	c. 42 core hrs + optional dairy if activated	c. 24 core hrs + optional dairy if activated		Core workload excludes secondary dairy

Seasonal Workload Distribution

Peak Season Management (Jun-Oct)

- Maximum core workload: around 44 hours/week, with optional secondary enterprises adding further hours only where capacity allows

- Single-person temporary capacity: core welfare, water, harvest and hygiene tasks only; secondary crops and events are paused
- Recovery periods: Built-in rest after intensive harvests
- Efficiency measures: Batch processing, combined deliveries

Off-Season Benefits (Nov-Feb)

- Reduced core workload: around 24-32 hours/week depending on winter maintenance, woodland work and processing
- Planning time: Business development, equipment maintenance

Skills development: training courses and system improvements will be scheduled principally during November-February, when operational workload is lowest.

Bad-Season and Illness Triage

If illness, family pressures, extreme weather or a poor season temporarily reduce available labour, the household will protect essential welfare, hygiene, water, food and monitoring tasks first. Secondary enterprises are deliberately designed to be paused without threatening the TAN 6 minimum-needs case.

Table 4-22A: Bad-season and illness triage

Priority	Tasks protected first	Tasks paused or reduced first
1. Legal / welfare / safety	Animal checks, water treatment, food hygiene, fire safety, sanitation, essential repairs	Events, optional workshops, new product trials
2. Core income	Mushroom harvests, microgreens, ferments already in production, CSA harvest and delivery bundling	Wasabi expansion, micro-dairy activation, non-essential retail outreach
3. Household food	Main vegetable beds, stored crops, polytunnel irrigation, preservation of surplus	Low-priority speciality crops
4. Land management	Invasive/pest response, habitat protection, dark-corridor and water checks	Aesthetic mowing, non-essential planting, optional volunteering days

Success Metrics & Monitoring

Workload Balance Indicators

- Neither partner exceeds a regular unsustainable workload in the core case; secondary enterprises are scaled only where labour capacity is available
- One person can maintain essential operations temporarily by pausing wasabi expansion, micro-dairy, events and non-essential product development
- Quality standards maintained during single-person operation
- Customer service levels preserved during emergencies

Efficiency Improvements Over Time

- Year 1: Learning curve, higher time requirements
- Year 2-3: Systems optimisation, reduced labour per unit
- Year 4-5: Mature operations, maximum efficiency
- Ongoing: Continuous improvement, technology integration

Seasonal Adjustment Protocols

Spring Startup (March)

- Gradual increase: Build from winter 32 hours to spring 46 hours
- System checks: Equipment maintenance, supply ordering
- Planning review: Adjust targets based on previous year
- Subsistence focus: 8 hours for intensive planting and soil preparation

Summer Peak (June-August)

- Maximum efficiency: around 44 core hours/week, with work scheduled early morning/evening in hot weather
- Heat management: Early morning and evening work schedules
- Harvest coordination: Synchronized picking and processing
- Subsistence maintenance: 8 hours for ongoing garden management

Autumn Processing (September-November)

- Peak workload: around 42 core hours/week, with preservation and storage prioritised over secondary product development
- Preservation focus: Fermentation, storage, value-adding
- Market preparation: Stock building for winter sales
- Subsistence harvest: 4 hours for final harvests and preservation

Winter Planning (December-February)

- Minimum operations: around 24-32 core hours/week, focused on animal/water checks, stored crops, winter maintenance and records
- Strategic planning: Next year preparation, system improvements
- Rest and recovery: Physical and mental preparation for next cycle
- Subsistence planning: 3 hours for seed ordering and garden planning

4.15 Conclusion

The business and improvement plan demonstrates that Lower Wych can meet the Year-5 TAN 6 minimum-needs test from on-site land-based activity while retaining a realistic margin for poor seasons and adaptive management. The core case of mushrooms, microgreens, ferments and CSA seasonal vegetable / fruit shares is sufficient on its own, generating approximately £10,410 net income after a conservative Year-5 central overhead against a £6,604 minimum-needs requirement. Wasabi, honey and micro-dairy are retained as secondary or supporting enterprises but are not required for compliance. The food budget is also stress-tested against the OPD 65% minimum, so the chapter does not rely on the 80% food self-sufficiency target being achieved perfectly in every year. Labour planning follows the same logic: daily work protects core income, welfare, water, food hygiene and household food first, while wasabi expansion, micro-dairy activation, events and non-essential product trials can be paused. This structure keeps the chapter detailed and ambitious while making the planning case more accurate, conservative and resilient.

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5.Land Management

5 Land Management

This section sets out the land-management strategy for the Lower Wych One Planet Development. It brings together the final land-use schedule, productive-growing logic, clean-water and greywater separation, ecological baseline evidence, habitat prescriptions and monitoring commitments. It reflects the Arbtech Preliminary Ecological Appraisal v2 dated 28 August 2025, including COFNOD biological records, and the subsequent GCN avoidance-led approach used in the supporting ecology evidence.

The section is structured so that the policy thread, baseline evidence, land-use areas, seasonal calendar, habitat prescriptions and monitoring methods can be followed by the Local Planning Authority, the applicants and future reviewers over the first five-year OPD monitoring period.

5.1 Objectives and Policy Framework

The land-management strategy has six linked objectives:

- Protect and enhance the existing woodland, hedgerows, scattered mature trees, pond habitats and ecological corridors identified by the Preliminary Ecological Appraisal.
- Convert low-diversity semi-improved / other neutral grassland into a managed mosaic of rotational grazing / poultry pasture, wildflower meadow, pollinator strips and a managed meadow / scrub-grassland wildlife-refugia matrix.
- Provide a credible land-based food and livelihood system through annual vegetables, protected crops, orchard and soft fruit, wasabi, mushrooms, low-input grazing and coppice.
- Keep productive irrigation water and greywater treatment physically and operationally separate so that edible crops are irrigated only with clean rainwater and clean runoff.
- Manage the site through measurable prescriptions, annual records and adaptive triggers rather than broad aspiration.
- Maintain a low-impact rural appearance by keeping built form, tracks, lighting and operational areas small, dark, permeable and landscape-integrated.

Land-management performance is measured against quantitative Year-5 targets set out in Table 5-2A. Year-1 baseline records are lodged before first habitation; targets are reviewed at the Year-3 mid-term verification point and reported in the Year-5 review. The following national and local policies and guidance sources guide land management at Lower Wych. The management prescriptions in Sections 5.5 to 5.7 give practical effect to these requirements on the site.

Table 5-1: Policy and guidance thread for land management

Example / theme	Policy or guidance	Key recommendation / principle	Application to the site
Placemaking and biodiversity	Planning Policy Wales, current edition [103]	Integrate placemaking, ecosystem resilience and biodiversity through nature-based solutions and green infrastructure.	Retain and enhance woodland, hedgerows, meadow, ponds, orchard and pollinator habitats as an integrated green-infrastructure network.
Low-impact livelihoods	TAN 6 and OPD Practice Guidance [104][109]	Support land-based livelihoods that meet minimum needs while maintaining a light touch on the environment.	Use small-scale annual horticulture, orchard/soft fruit, mushrooms, wasabi, grazing and coppice within a monitored land-management plan.
Ecosystem resilience and connectivity	Nature Recovery Action Plan for Wales [105]	Restore and extend habitats beyond designated sites; strengthen nature networks; reduce pressures including pollution and invasive species.	Reinforce woodland-edge, hedgerow and pond connectivity; create managed scrub-grassland mosaic, pollinator strips and species-rich grassland.
Sustainable land management	Agriculture (Wales) Act 2023 and Sustainable Farming Scheme principles [106]	Support soil, water, biodiversity, climate and productivity outcomes through sustainable land management.	Use no-dig beds, low-input grazing, managed meadow / scrub-grassland management, coppice, orchard, clean-water irrigation and nutrient cycling.

Example / theme	Policy or guidance	Key recommendation / principle	Application to the site
Biodiversity duty	Environment (Wales) Act 2016, Section 6 [107]	Maintain and enhance biodiversity and promote ecosystem resilience through diversity, connectivity, scale, condition and adaptability.	Prioritise habitat connectivity, woodland/hedgerow condition, species-rich grassland, pond habitat and adaptive monitoring.
Habitats and species of principal importance	Environment (Wales) Act 2016, Section 7 [108]	Protect habitats and species of principal importance, including hedgerows, ponds, lowland woodland and protected species.	Protect mature trees, hedgerows and woodland; maintain dark corridors; provide boxes, hibernacula, log piles and pond margins.
Pollinator conservation	Action Plan for Pollinators in Wales and Bee Friendly guidance [110] [111]	Provide continuous forage, reduce pesticides, and create/retain pollinator habitat.	Create orchard blossom, wildflower meadow, pollinator strips, beetle banks, uncut margins and pesticide-free productive areas.
Local biodiversity and green infrastructure	Wrexham biodiversity / green-infrastructure priorities [112]	Enhance biodiversity, ecosystem resilience and green infrastructure.	Use a site-wide habitat mosaic with meadow, orchard, hedge-laying, ponds, woodland-edge management and productive habitats.
Hedgerow protection	Hedgerow Regulations 1997 [115]	Protect important hedgerows and manage outside the main nesting season.	Retain all hedgerows, avoid March-August cutting, gap-plant with native species, and lay/cut in rotation.
LANDMAP landscape habitat layer	Natural Resources Wales LANDMAP [114]	Maintain and strengthen ponds, hedgerows, woodland connectivity and grassland habitats.	Retain woodland; add new coppice blocks; manage grassland matrix; add ponds, wetland polishing and pollinator corridors.
LANDMAP cultural landscape layer	Natural Resources Wales LANDMAP [114]	Reinstate traditional rural management and protect field patterns, hedges and veteran trees.	Use hedge-laying, managed meadow, orchard, low-input grazing, coppice and a low-key rural layout.
LANDMAP visual and sensory layer	Natural Resources Wales LANDMAP [114]	Maintain wooded enclosure, tranquillity and dark rural character.	Keep buildings clustered and screened; use permeable surfaces, low-reflectance finishes and a <=0.5 lux habitat-edge lighting limit.
Bats and lighting	BCT / ILP Guidance Note 08/23 [119]	Avoid, minimise and control artificial light spill onto commuting and foraging habitat.	No floodlighting; warm low-lux PIR fittings only where necessary; no light spill to woodland edges, hedgerows or ponds.

5.2 Baseline, Principal Habitats / Species and Outstanding Ecological Evidence

A Preliminary Ecological Appraisal has been completed by Arbtech. This section relies on PEA v2 dated 28 August 2025, following the site survey on 31 July 2025, which incorporates COFNOD biological records. The PEA records lowland mixed deciduous woodland, other neutral grassland, bramble scrub, a pond, scattered trees and native hedgerows. It identifies the lowland mixed deciduous woodland and native hedgerows as habitats of principal importance / priority habitats, with other neutral grassland assessed as poor condition but suitable for enhancement.

The PEA v2 identifies Doley Wood and Meadows Local Wildlife Site adjacent to the site. The proposed dwelling, access, productive growing areas, ponds and enterprise infrastructure are located outside the LWS but adjacent to it. The retained woodland is treated as an on-site ecological constraint and adjacent sensitive receptor. Nearby Local Wildlife Sites and notable habitats include Lower Wych Meadows, Black Wood / Kidnuffin Wood / The Gelli, Iscoyd

Brook, ancient woodland, lowland meadows, lowland fens, traditional orchards and purple moor-grass / rush pasture in the wider 2 km context. These findings strengthen the need for a careful, connected habitat strategy rather than a site-only approach.

Figure 5-1: Baseline Habitat and Ecological Features Plan



Figure 5-1: Baseline Habitat and Ecological Features Plan. The plan shows the existing habitat baseline, including lowland mixed deciduous woodland, other neutral grassland, bramble scrub, ponds, scattered trees, native hedgerow, built linear features and recorded mammal holes.

Figure 5-2: Low-impact lighting and dark-corridor plan.



Figure 5-2: Indicative Low-Impact Lighting Strategy. The plan shows indicative low-impact external lighting locations and retained dark corridors in relation to woodland edge, hedgerows, ponds, bat commuting routes and the proposed building cluster. Lighting will be warm-colour, shielded, downward-directed and limited to safe access and essential task use only.

Table 5-2: Site-specific baseline assets, constraints and management response

Baseline asset / constraint	Area / status	Management response
Existing broadleaved woodland	3,829 m² / 0.946 acres; PEA condition good; on-site lowland mixed deciduous woodland section	Retain in full, avoid compaction, retain deadwood where safe, manage woodland edge and dark corridors. No built form, productive infrastructure, material storage or runoff discharge within the on-site woodland section.
Doley Wood and Meadows Local Wildlife Site	A section of the 5.12-acre site lies adjacent to Doley Wood and Meadows LWS. This relates specifically to the retained on-site lowland mixed deciduous woodland, c. 3,829 m² / 0.946 acres, which extends beyond the site boundary into adjacent land. The remainder of the holding, including dwelling, access, productive areas and water-management features, is outside the LWS but adjacent to it.	Treat as an on-site ecological constraint and adjacent sensitive receptor. No direct loss proposed. Apply CEMP, pollution prevention, BS5837/RPA protection, low-impact lighting, no material storage, no runoff discharge and woodland-edge buffer management.
Native hedgerows and mature boundary vegetation	PEA condition good; retained	Strengthen by gap planting, rotational cutting / laying, protection during works and no light spill.
Scattered trees T1-T16	Good/moderate condition; retained	Protect RPAs during works. Roost features noted on T1, T12, T13 and T14 but trees are retained; FAR only if works later affect those features.
On-site pond P1 and wider pond network	P1 approx. 11 m x 20 m / 220 m²; HSI excellent for GCN	P1 and P5 are confirmed positive for great crested newt eDNA; P2 / relevant wider pond context is treated on an assumed-presence basis where access was not secured. Retain P1, maintain pollution controls, create clean-water ponds and separate greywater polishing pond, and apply the GCN RAMS / CEMP / stop-work procedure during works.
Other neutral grassland	PEA condition poor; enhancement opportunity	Improve through G1 rotational grazing / poultry pasture, H3 wildflower meadow, H4 pollinator strips and H6 managed meadow / scrub-grassland mosaic.
Bramble scrub / rough margins	Dense scrub present to west	Retain and manage as part of H6 refugia mosaic; avoid wholesale clearance during nesting season.
Mammal holes / badger context	Two mammal holes recorded; 30 m zone considered	Avoid disturbance and mark on constraints plan; pre-commencement check if works delayed or if activity changes.
Soils	RHS test: clay loam, pH 6.5, organic matter 6.2%, P index 3, K index 1, Mg index 3	Use compost, mulch, green manures and fertility cycling in productive areas; avoid fertiliser inputs to species-rich grasslands; re-test at Year 3 and Year 5.
Water and drainage sensitivity	On-site pond, LWS context and wider catchment sensitivity	Use clean-water ponds for edible irrigation only; direct greywater to reedbed, polishing pond, infiltration and/or non-edible planting.

5.2.1 Habitats and Species of Principal Importance

The site supports, or is functionally connected to, habitats and species listed under Section 7 of the Environment (Wales) Act 2016 as Habitats and Species of Principal Importance. The following list is framed from the PEA v2 findings and COFNOD records.

Table 5-2A: Section 7 habitats/species context and Section 5 response

Habitat / species group	PEA v2 / COFNOD context	Section 5 management response
Lowland mixed deciduous woodland (HoPI)	3,829 m² retained lowland mixed deciduous woodland on the north-western / northern edge of the holding, plus connected woodland extending beyond the site boundary and in the wider landscape.	Retain, protect from construction impacts, maintain dark edges, deadwood and structural diversity; avoid any direct loss or indirect pollution / lighting / drainage impacts to the on-site LWS woodland section.
Hedgerows (HoPI)	Native hedgerows along the southern, eastern and western boundaries; PEA condition good.	Retain, gap-plant, manage on rotation outside nesting season and maintain connectivity.
Ponds / standing water and amphibian habitat	On-site pond P1 has excellent GCN HSI; wider pond network within 500 m.	Apply the confirmed / assumed-presence approach for GCN, retain P1, create clean-water ponds, provide hibernacula and maintain pollution controls through the GCN RAMS and CEMP.
Bats (SoPI group)	COFNOD records include common pipistrelle and brown long-eared bat. Site provides foraging and commuting habitat along woodland edges, hedgerows, pond and tree lines.	Maintain dark corridors, low-impact lighting and bat boxes; no further bat activity survey required by PEA for the current retained-tree scheme.
Nesting / farmland / woodland birds	COFNOD records include barn owl, reed bunting, spotted flycatcher, moorhen, bittern and chaffinch; PEA records birds seen/heard and likely nesting habitat.	Avoid nest disturbance; no routine hedge/tree/scrub clearance March-August unless checked; install bird boxes.
Great crested newt and common amphibians	Historic GCN records in the wider area; P1 assessed as excellent HSI suitability by the PEA; follow-up eDNA confirms GCN presence in P1 and P5, with P2 / relevant wider pond context treated on an assumed-presence basis where access was not secured; COFNOD records include common frog.	Avoidance-led GCN RAMS, precautionary working methods, hibernacula, retained ponds, dark corridors, trench checks and stop-work procedures. If any later work cannot remain within the RAMS envelope, pause and seek project ecologist / LPA advice before proceeding.
Reptiles	No COFNOD/EPSL records found in PEA v2, but habitat is suitable and reptiles are likely to use the site.	Precautionary working method, ECoW for relevant clearance, log piles and refugia.
Badger / hedgehog / rabbit	Badger and hedgehog records noted from COFNOD; two mammal holes recorded on site; hedgehogs likely to use the site.	Precautionary working methods, excavation ramps/covers, mammal-hole buffers and refugia.
Otter and water vole	COFNOD otter records in wider area; Wych Brook provides optimal otter habitat; water vole presence cannot be wholly ruled out.	No works close to watercourse; avoid night lighting and pollution; stop works if evidence found.
Hazel dormouse	COFNOD records in wider area; woodland connectivity means presence cannot be discounted.	Avoid encroachment into retained woodland; precautionary working methods; stop works if evidence found.

5.2.2 Outstanding ecological evidence and construction-stage safeguards

The updated PEA v2 incorporates COFNOD records and identifies the ecological safeguards required for the application. Since the PEA was issued, follow-up eDNA evidence has confirmed great crested newt presence in P1 and P5. P2 / the relevant wider pond context is treated on an assumed-presence basis where access was not secured. These matters are therefore treated as part of the planning and pre-commencement programme, with the application proceeding on an avoidance-led basis through the GCN RAMS, CEMP, low-impact lighting strategy and Green Infrastructure Statement.

Table 5-2B: Required ecological evidence and safeguards

Item	PEA v2 position	Section 5 response
Green Infrastructure Statement	Required by the PEA to deliver net biodiversity benefit.	Submit with the planning application and align with this Section 5 land-management plan.
Construction Environmental Management Plan (CEMP)	Required / may be required to minimise pollution risk to the on-site pond, retained lowland mixed deciduous woodland section, and adjoining woodland habitats.	Prepare before works and include pollution prevention, dust/silt control, materials storage exclusions, protective fencing, ecological toolbox talks, emergency response and no runoff discharge toward the on-site woodland.
Great crested newt eDNA	The PEA recommended eDNA survey of P1, P2 and P5 where accessible. Follow-up eDNA confirms GCN presence in P1 and P5. P2 / relevant wider pond context is treated on an assumed-presence basis where access was not secured.	Proceed on an avoidance-led basis: retain P1, protect pond and terrestrial habitat, prohibit storage / fuel / washout / unloading / refuelling / machinery parking within the P1 protection zone, maintain dark corridors, apply trench checks and stop-work procedure, and implement the GCN RAMS / CEMP.
Low-impact lighting strategy	PEA requires low-impact post-development lighting to minimise disturbance to commuting bats.	Use the low-impact lighting and dark-corridor plan to show dark corridors, fixture locations, warm low-lux fittings and the habitat-edge lux limit.
Precautionary working methods	Required for birds, amphibians, reptiles, otter, water vole, hazel dormouse, badger, hedgehog and rabbits.	Include in CEMP, contractor induction and pre-commencement ecological checks.
Tree / RPA protection	PEA recommends retained trees protected to BS5837:2012.	Show RPAs on constraints plan; use protective fencing and no storage/ trafficking within RPAs.

5.2.3 Hedgerow Regulations 1997

The boundary hedgerows are treated as potentially important hedgerows for management purposes. No hedgerow removal is proposed as part of the development. Any future works that could constitute hedgerow removal will be assessed under the Hedgerow Regulations 1997 and notified where required. Routine management will avoid the main bird-nesting season and will be recorded in the annual land-management diary.

5.3 Land-use Schedule and Management Zones

The following schedule replaces the earlier broad zone acreages. It uses a rounded whole-site basis of 20,700 m², taken from the confirmed title-deed area of 20,710 m² / 5.12 acres.

Table 5-3: Exclusive land-use area schedule for Section 5

Land-use category	m²	ha	acres	% site	Interpretation
Built footprint: dwelling, business building and open barn	313	0.031	0.077	1.51%	Low built footprint; includes dwelling, business/agricultural building and separate open barn/tool store.
Access, parking, turning and paths	256	0.026	0.063	1.24%	Permeable / grass-reinforced surfaces wherever practical.
Intensive annual horticulture: vegetable beds + polytunnels	470.4	0.047	0.116	2.27%	Net growing area; paths excluded. Used for yield and irrigation calculations.

Land-use category	m²	ha	acres	% site	Interpretation
Speciality crops: wasabi + outdoor mushrooms	250	0.025	0.062	1.21%	100 m² wasabi plus 150 m² mushroom log / woodchip area.
Orchard and soft fruit	1,550	0.155	0.383	7.49%	1,550 m² total: 850 m² orchard + 700 m² orchard / soft-fruit planting.
Existing broadleaved woodland / on-site woodland retained	3,829	0.383	0.946	18.50%	Retained and managed positively; separate from new coppice.
New coppice blocks	2,250	0.225	0.556	10.87%	C1-C4 new mixed native coppice blocks; one combined 7-year rotation schedule.
Dedicated wildflower meadow block	1,125	0.113	0.278	5.43%	Flower-rich meadow / floristic enhancement area.
Pollinator strips / beetle banks	963	0.096	0.238	4.65%	Productive habitat corridors and beneficial-insect support.
Managed meadow / scrub-grassland mosaic / wildlife refugia	6,683.2	0.668	1.651	32.29%	Large managed ecological matrix including rough meadow, late-cut areas, scrub pockets, hibernacula, log piles and wildlife refugia.
Low-input rotational grazing / poultry pasture	2,810	0.281	0.694	13.57%	Named grazing / poultry pasture category for low-density rotational management.
Ponds + reedbed	200.4	0.020	0.050	0.97%	Two clean-water ponds, one greywater polishing pond and 15 m² reedbed.
TOTAL	20,700	2.070	5.115	100.00%	Exclusive categories sum to whole-site area.

Table 5-4: Landscape Plan Rev A zone logic for Section 5

Zone	Description	Management interpretation
Zone 1	House and business buildings	Domestic dwelling, business/agricultural building, open barn, parking and immediate working surfaces.
Zone 2	Water system	Two 10 m clean-water irrigation / attenuation ponds; 15 m² greywater reedbed; 6 m greywater polishing pond; clean-water and greywater routes kept separate.
Zone 3	Market garden, polytunnels and wasabi bed	Annual vegetables, protected crops, microgreens/propagation and 100 m² low-tech wasabi beds.
Zone 4A-4D	New coppice blocks	Coppice is in several areas but managed as one 2,250 m² rotation schedule.
Zone 5	Outdoor mushroom area	150 m² separate outdoor log / woodchip area, not counted as woodland, coppice or refugia.
Zone 6	Orchard and soft fruit	1,550 m² orchard and soft-fruit system.
Zone 7	Managed meadow / scrub-grassland mosaic / wildlife refugia	6,683.2 m² managed habitat matrix including rough meadow, scrub-grassland transition, hibernacula, invertebrate refugia and low-intervention wildlife areas.
G1	Low-input rotational grazing / poultry pasture	2,810 m² named grazing / poultry pasture managed with low stocking density, temporary fencing and rest periods.

5.4 Operational Calendar

The land will be managed by seasonal ecological windows rather than by fixed dates alone. The calendar below is a practical guide; actual timing will respond to weather, soil conditions, nesting birds, flowering and ground wetness.

Table 5-5: Seasonal land-management calendar

Season / window	Main land-management tasks	Controls and checks
January-February	Hedge-laying, coppice cutting, tree-guard checks, bird/bat box checks, tool maintenance, pond safety checks.	Avoid wet-soil trafficking; undertake only outside sensitive periods; retain deadwood and habitat piles.
March-August	Main bird-nesting season. No routine hedge cutting, scrub clearance or tree works. Establish annual beds, polytunnel crops and monitoring routes.	Vegetation clearance only after ecologist check where unavoidable. Maintain dark corridors and low disturbance around ponds/hedges.
April-June	GCN RAMS / pond-refugia checks; breeding bird checks; early pollinator and butterfly recording; sow wildflower gaps where needed; check pond margins, reedbed and irrigation ponds.	Protect nesting birds and amphibians; manage silt traps and clean-water routes before summer irrigation demand.
June-August	Bat-sensitive period; static detector / bat activity monitoring if undertaken; butterfly transects; meadow quadrat survey in July; manage market garden irrigation.	Avoid lighting spill; retain ecological minimum water in irrigation ponds; no greywater to edible irrigation.
July-August	Hay cut on G2 species-rich meadow once seed has set, followed by arisings removal. Late-summer cut of dedicated wildflower meadow where appropriate.	Leave refugia and uncut margins; avoid cutting all pollinator habitat at once.
September-October	Aftermath grazing / low-input grazing where ground conditions allow; orchard harvest and pruning of soft fruit where appropriate; seed collection; review crop yields.	Use short, low-intensity grazing pulses with rest periods; avoid poaching.
November-December	Hedgerow gap planting, orchard planting, coppice beat-up planting, woodland understorey planting, review annual monitoring and remedial actions.	Plant in dormant season; protect from rabbits/deer; update five-year action log.

5.5 Detailed Prescriptions by Habitat and Productive System

The following prescriptions are written so that they can be used by the applicants, ecologist and Local Planning Authority during implementation and annual monitoring. They use the settled land-use area schedule and practical management tests for the first five-year OPD period.

Table 5-6: Existing broadleaved woodland (H1)

Item	Prescription
Asset / area	Existing broadleaved woodland: 3,829 m² / 0.946 acres, assessed by the PEA as good condition. The LWS is adjacent to the site boundary.
Management prescription	Retain in full; manage lightly for safety, structure and ecological value. Retain standing and fallen deadwood where safe, maintain woodland-edge structure and avoid light spill, root disturbance, material storage, sediment runoff or greywater discharge. Selective thinning is permitted only where safety or regeneration objectives require, with arboricultural / ecological advice where needed.
KPIs / success checks	No avoidable woodland loss. Deadwood retained where safe. Woodland edge shows varied structure by Year 5. No lighting spill to woodland edge above agreed habitat-edge limit.
Monitoring / record	Annual winter woodland walkover; fixed photo points; record tree safety works, deadwood retained and any disease/storm damage.

Item	Prescription
Trigger and remedial action	Safety issue / disease -> arborist/ecologist advice. Compaction -> fence and remediate. Light spill -> shield/remove fitting.

Table 5-7: Hedgerows and boundary vegetation

Item	Prescription
Asset / area	All retained native hedgerows and boundary vegetation.
Management prescription	Retain and strengthen all boundary hedgerows; gap plant with native species including hawthorn, blackthorn, hazel, field maple and dog rose. No mechanical cutting between 1 March and 31 August unless an ecologist confirms no active nests. Rotational cutting on a 3-year winter cycle, with sections allowed to grow taller for blossom and berries. Hedge laying on a 15-25 year cycle for sections in suitable condition. Gap planting in the next winter season after losses.
KPIs / success checks	No hedgerow removal. By Year 5, denser structure, improved gap closure and visible blossom/berry production. Dark corridors maintained along hedges.
Monitoring / record	Annual winter hedgerow walkover, fixed photos, planting survival check, hedge-laying/cutting log.
Trigger and remedial action	Planting failures -> beat-up. Over-cutting -> lengthen rotation. Light spill -> adjust fitting.

Table 5-8: Mature trees and Root Protection Areas

Item	Prescription
Asset / area	Scattered trees T1-T16, including mature oaks and hawthorn trees.
Management prescription	Retain mature trees and protect Root Protection Areas during all works through fencing in accordance with BS5837:2012. 2 integrated bat boxes incorporated into suitable proposed building fabric, with final elevation, aspect, fixing height and specification confirmed with the project ecologist; and 12 bird boxes of mixed types, including boxes suitable for small-hole nesting birds, open-fronted / woodland-edge nesting birds, and swift / sparrow-type boxes where building elevations allow.
KPIs / success checks	All retained trees protected. No avoidable RPA disturbance. Boxes installed away from artificial light, with clear flight/access routes where relevant.
Monitoring / record	Annual tree and box check in late winter; record any works in tree log.
Trigger and remedial action	RPA damage -> stop works and remediate. Box failure or unsuitable location -> relocate following ecological advice.

Table 5-9: Low-input rotational grazing / species-rich pasture (G1)

Item	Prescription
Asset / area	G1: 2,810 m² low-input rotational grazing / poultry pasture.
Management prescription	Poultry and any future small livestock will be managed with temporary fencing, low stocking density and rest periods of 21-28 days between grazing events. Mobile hen housing and any future goat shelter are indicative/demountable and rotate within G1 to avoid poaching. A grazing diary records area, dates, species, stocking density and rest periods. Livestock are excluded from ponds, reedbed, polishing pond, swales, RPAs and the LWS woodland.
KPIs / success checks	Sward shows varied height and structure; no persistent poaching; flowering plants increase; pasture supports livestock without becoming nutrient-enriched improved grassland.
Monitoring / record	Grazing diary, sward notes, fixed photo points, annual soil/vegetation checks.

Figure 5-3: Indicative Bat and Bird Box Enhancement Locations



Figure 5-3: Indicative Bat and Bird Box Enhancement Locations. The plan shows indicative bat and bird box locations in relation to retained trees, hedgerows, woodland-edge habitat, proposed buildings.

Item	Prescription
Trigger and remedial action	Poaching or bare ground -> remove stock and rest area. Declining diversity -> reduce pressure, remove arisings or introduce yellow rattle / green hay where appropriate.

Table 5-10: Managed meadow component within H6 managed meadow / scrub-grassland mosaic / wildlife refugia

Item	Prescription
Asset / area	H6 managed meadow component: included within the 6,683.2 m² managed meadow / scrub-grassland mosaic / wildlife refugia total. No separate headline land-use area is counted.
Management prescription	Manage selected H6 meadow components through low-input late cutting, target late July to mid-August depending on flowering and weather, with arisings removed where practicable. Other H6 areas remain rough, tussocky or scrubby to provide overwintering structure. Occasional very light conservation grazing may be used only if needed and only where ground/ecology conditions allow.
KPIs / success checks	By Year 5, H6 contains a visibly managed mosaic of rough meadow, flowering grassland, tussocky areas, scrub pockets, hibernacula and log-pile refugia, with increased forb diversity and no unmanaged blanket scrub closure.
Monitoring / record	Permanent quadrats / fixed photo points in representative H6 meadow components, annual winter structure walkover and refugia log.
Trigger and remedial action	Poor floristic response -> adjust cutting / arisings removal, introduce yellow rattle / green hay / plugs. Excess scrub closure -> selective rotational cutting. Loss of structure -> retain more overwintering margins and scrub pockets.

Table 5-11: Dedicated wildflower meadow block (H3)

Item	Prescription
Asset / area	H3: 1,125 m² dedicated wildflower meadow block.
Management prescription	Establish flower-rich meadow with native local-provenance seed or green hay. Target at least 25 native forb species established by Year 5 and at least 40% native flowering-forb cover during the July flowering season. Annual cut-and-lift in late August-September; remove arisings; no fertiliser inputs.
KPIs / success checks	By Year 5, diverse flowering sward, continuous summer forage and reduced dominance of coarse grasses.
Monitoring / record	Quadrats and fixed photo points; annual flowering cover estimate in July; cut/lift log.
Trigger and remedial action	Poor establishment -> overseed/plug plant; rank sward -> cut earlier and remove arisings; nutrient enrichment -> reduce inputs and remove cuttings.

Table 5-12: Pollinator strips and beetle banks (H4)

Item	Prescription
Asset / area	H4: 963 m² pollinator strips and beetle banks.
Management prescription	Strip width 1.5-3 m, located alongside productive areas, paths and field edges. Provide continuous forage with overlapping flowering periods from April to October. No pesticides. Include native nectar mix plus structural beetle-bank planting with tussocky native grasses for invertebrate refugia and over-wintering.
KPIs / success checks	On warm still days, bees, hoverflies, butterflies and other insects are visible. Flowering gaps are avoided across the season.
Monitoring / record	Monthly pollinator / butterfly walk April-September; flowering-period notes; cutting records.
Trigger and remedial action	Forage gap -> add early/late flowering species. Rank strips -> cut and remove arisings. Low pollinator activity -> adjust cutting and reduce disturbance.

Table 5-13: Managed scrub-grassland mosaic / wildlife refugia (H6)

Item	Prescription
Asset / area	H6: 6,683.2 m² managed meadow / scrub-grassland mosaic / wildlife refugia.
Management prescription	Actively manage the broad habitat matrix as rough meadow, scrub-grassland transition, native scrub pockets, tussock grass, hibernacula, log piles, bramble/blackthorn/hawthorn refugia and other low-intervention wildlife areas. This is not residual unmanaged land. Year-1 creation: at least 3 hibernacula per ha and at least 5 log / brash refugia features across the H6/C1-C4/H3/H4 interface, with later adaptive additions if monitoring shows gaps.
KPIs / success checks	Mosaic remains open, sunny and structurally varied; refugia maintained; no unmanaged blanket scrub closure.
Monitoring / record	Annual winter structure walkover; photo points; refugia log; invasive species checks.
Trigger and remedial action	Too much scrub -> rotational cut. Too little structure -> allow selected regeneration. Refugia damaged -> repair.

Table 5-14: Orchard and soft fruit

Item	Prescription
Asset / area	P4: 1,550 m² orchard and soft-fruit areas.
Management prescription	Plant apples, pears, plums and soft fruit including raspberries, blackberries, currants, gooseberries and rhubarb, using disease-resistant varieties and rootstocks suited to site conditions. Maintain floristic understorey and allow controlled grazing only where compatible with tree protection. Use mulch, compost and guards. Tree-fruit Year-5 yield will be cautious; soft fruit contributes earlier.
KPIs / success checks	By Year 5, orchard structure established with good survival and early fruiting from soft fruit/dwarf trees; blossom contributes to pollinator network.
Monitoring / record	Annual survival count, pruning record, yield record, pest/disease notes, fixed photos.
Trigger and remedial action	Losses >20% -> replant. Browsing damage -> improve guards/fencing. Disease -> adjust varieties/management.

Table 5-15: Annual vegetables, polytunnels and edible-crop irrigation

Item	Prescription
Asset / area	P1/P2: 326.4 m² outdoor annual vegetable beds and 144 m² protected cropping / polytunnels.
Management prescription	Operate as net growing space for household food, CSA, ferment crops, microgreens and protected crops. Use no-dig beds, compost, green manures, mulches and crop rotation. Edible crops are irrigated only with clean harvested rainwater and clean runoff from the two 10 m irrigation / attenuation ponds and header tanks. Treated greywater, reedbed effluent, compost leachate and dirty yard runoff are excluded from edible-crop irrigation.
KPIs / success checks	Cautious planning range c. 1.8-2.4 tonnes/year vegetables and protected crops by Year 5. Irrigation records show clean-water-only use.
Monitoring / record	Cropping plan, harvest log, CSA log, irrigation log, soil test and fixed photos.
Trigger and remedial action	Under-yield -> adjust crop mix/labour/rotation. Water stress -> prioritise seedlings, polytunnel fruiting crops and high-value crops.

Table 5-16: Wasabi, outdoor mushroom area and indoor mushroom room

Item	Prescription
Asset / area	P5/P6/P7: 100 m² low-tech outdoor wasabi beds; 150 m² outdoor mushroom log/wood-chip area; 18 m² indoor mushroom room within business building.
Management prescription	Wasabi is grown in low-technology outdoor gravel / pebble prepared beds near the woodland-edge microclimate, supplied only by clean water. Outdoor mushrooms use shaded log stacks and woodchip beds. The 18 m² indoor mushroom growing room is a small insulated fruiting space using passive humidity management, intermittent low-energy ventilation and humidity support only where required, not continuous climate-controlled fruiting. Energy use is metered within the enterprise/ancillary load allowance.
KPIs / success checks	Wasabi establishes without greywater use. Mushroom production target c. 220-240 kg/year total by Year 5, of which c. 200 kg/year is saleable and c. 20-40 kg/year retained/grade-out. Indoor energy use remains within monitored allowance.
Monitoring / record	Production log, water source log, indoor energy sub-meter, substrate/spawn records, contamination/waste record.
Trigger and remedial action	Poor wasabi performance -> adjust shade/water flow. Mushroom contamination or energy excess -> reduce throughput, improve passive controls and review enterprise load.

Table 5-17: Community Supported Agriculture scope

Item	Prescription
Asset / area	CSA enterprise and seasonal share from the productive system.
Management prescription	Indicative Year-5 scale is 15 households x 24 weeks = 360 box-weeks per year, with each share averaging 2-2.5 kg of seasonal mixed produce, equivalent to approximately 720-900 kg/year. The CSA is a seasonal mixed-produce supplement, not a full weekly household vegetable replacement box. It is supported by microgreens, mushrooms, ferments, honey and orchard / soft fruit as these become available. Year-5 scale is contingent on demonstrated demand and labour capacity from Years 1-3 trial sales.
KPIs / success checks	CSA remains within the productive capacity of P1/P2 plus orchard/mushroom/honey/ferment systems; no over-commitment of land or labour.
Monitoring / record	CSA box log, crop allocation log, waiting-list / demand record, labour diary.
Trigger and remedial action	If output or labour is insufficient -> reduce box number, box weight or season length before increasing pressure on habitat areas.

Table 5-18: New coppice and biomass

Item	Prescription
Asset / area	H2: 2,250 m² new mixed native coppice in 3-4 blocks, C1-C4.
Management prescription	New coppice totals 2,250 m² under one combined 7-year rotation, with indicative annual coupe of c.321 m². Species selection prioritises hazel and willow for short-rotation coppice, with alder, field maple and thorn/rose edge planting where soil and aspect are suitable. The energy strategy requires approximately 375 kg/year of seasoned wood for low-solar resilience-mode heating only, equivalent to about 1.7 t/ha/year over 0.225 ha. During establishment, woodfuel is supplied principally from lawful off-site sustainable sources or small arisings, with on-site coppice output phased in as the rotation matures.
KPIs / success checks	By Year 5, coppice blocks are established; by Year 7, first coupe available. Woodfuel use remains small and recorded as resilience heat, not primary heating.
Monitoring / record	Coppice survival check, coupe map, harvest log, woodfuel log, seasoning/storage record.
Trigger and remedial action	Poor establishment -> beat-up planting and protection. Over-harvest risk -> extend rotation or use local sustainable logs temporarily.

Table 5-19: Ponds, reedbed, greywater and surface-water controls

Item	Prescription
Asset / area	W1/W2: two 10 m clean-water irrigation / attenuation ponds; W4: 6 m greywater polishing pond; W5: 15 m² reedbed.
Management prescription	Maintain clean-water irrigation / attenuation ponds with planted wildlife margins, ecological minimum water level, silt controls and controlled overflow. Design follows Freshwater Habitats Trust principles: clean catchment, varied bathymetry, graded shallows, at least one deeper zone, 60-80% sun-lit, no fish stocked, and native local-provenance marginal planting only. The 6 m polishing pond receives treated greywater after the 15 m² subsurface-flow reedbed; it is not connected to edible irrigation.
KPIs / success checks	Ponds retain ecological minimum water. Greywater remains separate from edible irrigation. Reedbed vegetation healthy and no odour/standing-water failure.
Monitoring / record	Weekly pond levels April-September; quarterly reedbed inspection; overflow photo log after major rainfall.
Trigger and remedial action	Low levels -> drought protocol. Reedbed failure -> divert to backup route and repair. Any greywater cross-connection -> stop and correct immediately.

Table 5-20: Protected species, lighting and construction safeguards

Item	Prescription
Asset / area	Birds, bats, amphibians, reptiles, otter, water vole, dormouse, badger, hedgehog, rabbit, the retained on-site LWS woodland and dark habitat corridors.
Management prescription	Implement PEA precautionary working methods through the CEMP. Avoid routine vegetation clearance March-August unless checked by an ecologist. Protect mammal-hole buffers, RPAs and retained on-site woodland. Avoid night lighting and light spill to woodland, hedgerows and ponds. Stop works and seek ecological advice if protected species evidence is found.
KPIs / success checks	No avoidable protected-species harm. Dark corridors retained. Construction works recorded and managed through ecological safeguards.
Monitoring / record	CEMP records, contractor toolbox talk, pre-commencement checks, lighting audit, incident log.
Trigger and remedial action	Species found / new sett / holt / nest -> stop works and seek ecologist advice. Lighting spill -> adjust immediately.

5.6 Monitoring Methodology and Quantitative Targets

The following targets and monitoring methods provide the audit trail required for annual OPD reporting. Baseline values will be recorded through the pre-commencement / Year 1 baseline survey programme and then reviewed at Year 3 and Year 5.

Table 5-21: Quantitative biodiversity, soil and carbon targets

Indicator	Year-1 baseline	Year-5 target	Method
Vascular plant species, H6 managed meadow component	To be recorded pre-commencement / Year 1 baseline	+30% species count vs Year 1 in representative H6 meadow components	Representative 1 m² quadrats / DAFOR survey in spring and late summer.
Vascular plant species, H3 wildflower meadow	To be recorded pre-commencement / Year 1 baseline	At least 25 native forb species established	DAFOR quadrat survey and species list.
Wildflower forb cover, H3	To be recorded pre-commencement / Year 1 baseline	At least 40% native flowering-forb cover by Year 5	Visual percentage cover estimate in July.

Indicator	Year-1 baseline	Year-5 target	Method
Butterfly species	To be recorded pre-commencement / Year 1 baseline	+5 species vs Year 1 where weather/ recording effort is comparable	UKBMS / Big Butterfly Count style fixed transect in July-August.
Breeding bird territories	To be recorded pre-commencement / Year 1 baseline	+20% territories vs Year 1 where habitat maturation and survey comparability allow	BTO BBS-style transect / territory mapping April-June.
Pollinator activity	To be recorded pre-commencement / Year 1 baseline	Sustained increasing trend over first five years	UK BeeWalk-style monthly monitoring April-September.
Standing deadwood stems, H1 woodland	To be recorded pre-commencement / Year 1 baseline	At least 3 stems per 0.1 ha retained where safe	Standing deadwood stem record.
Fallen deadwood volume, H1 woodland	To be recorded pre-commencement / Year 1 baseline	Movement toward 30 m^3/ha by Year 5 where safe and compatible with access	Line-intercept or simple deadwood volume estimate.
Soil organic matter, P1 vegetable beds	6.2% RHS baseline, Nov 2025	7.0-7.5% by Year 5	RHS analysis at Year 3 and Year 5.
Soil organic matter, G1 grazing pasture	To be recorded pre-commencement / Year 1 baseline	+0.3-0.5 percentage points over 5 years	RHS analysis at Year 5.
Indicative carbon sequestration above baseline	0	c. 1.5-3.0 tCO2e/year by Year 5, indicative only	Reviewed at Year 5 against tree growth and soil analysis; not used as formal offset unless separately verified.
Hedgerow structural condition	To be recorded pre-commencement / Year 1 baseline	All retained hedgerows in good or improving structural condition by Year 5	Hedgelink-style condition assessment and fixed photos.
Bat activity / dark corridor function	To be recorded pre-commencement / Year 1 baseline	No decline in use of dark corridors where monitoring is undertaken; species count maintained where comparable	Static detector in June/August and lighting audit, if required / adopted as monitoring.

Table 5-22: Monitoring methods, success checks and adaptive triggers

Topic	Method	Success check	Triggers and actions
Birds	Two early-morning visits April-June on a fixed route, recording singing males / territories and nesting evidence; disturbance avoided.	Trend in breeding bird territories and species richness compared with baseline.	No improvement / decline -> review hedgerow cutting, scrub mosaic, boxes and disturbance.
Bats and lighting	Lighting audit after installation; optional static detector monitoring in June/August if required or adopted; record dark corridors and any complaints/observations.	No light spill to woodland/ hedgerow/pond corridors; bat species/activity maintained where monitored.	Light spill or low activity -> shield/relocate/remove fittings and review lighting plan.

Topic	Method	Success check	Triggers and actions
Great crested newt / amphibians	Confirmed / assumed-presence approach. Annual pond/refugia checks; record hibernacula; review any works near P1, P5 or suitable terrestrial habitat against the GCN RAMS before commencement.	GCN RAMS implemented; retained ponds and refugia maintained; no avoidable GCN harm; no pond degradation or greywater / pollution pathway to GCN habitat.	If works cannot remain within the avoidance-led RAMS envelope, pause and seek project ecologist / LPA advice before proceeding. Pond degradation -> remedial action.
Meadow / pasture vegetation	Representative quadrats in H6 managed meadow components, G1 pasture and H3 wildflower meadow, with GPS and photo points; surveyed in July plus spring notes.	Increasing forb richness, lower coarse-grass dominance, movement toward species-rich neutral grassland.	Poor response -> adjust cut/graze timing, remove arisings, introduce yellow rattle/green hay/plugs.
Pollinators and butterflies	Monthly fixed transect April-September in suitable weather; record flowering continuity.	Regular pollinator activity and no major seasonal forage gaps.	Forage gaps -> add early/late flowering species and change cutting pattern.
Woodland and coppice	Annual winter walkover; record coppice survival/coupe, deadwood, browsing and edge structure.	No avoidable woodland loss; coppice survival >80%; deadwood retained where safe.	Low survival or browsing -> beat-up planting and guards/fencing; adjust rotation.
Hedgerows	Annual winter walkover with photo points and cutting/laying record.	No net hedgerow loss; denser structure; blossom/berry production; dark corridors maintained.	Gap failures -> beat-up; over-cutting -> extend cycle; light spill -> adjust.
Ponds, reedbed and water features	Weekly pond levels April-September; monthly otherwise. Quarterly reedbed inspection. Record overflow after major rainfall.	Clean-water ponds retain ecological minimum; reedbed healthy; greywater remains separate from edible irrigation.	Low pond levels -> drought response. Reedbed failure -> divert and repair. Greywater cross-connection -> stop and correct.
Soil organic matter	RHS soil analysis at Year 3 and Year 5 for P1/G1; earthworm counts in sample pits where practical.	P1 reaches 7.0-7.5% SOM; G1 increases by 0.3-0.5 percentage points over first cycle.	Decline -> increase compost/mulch/green manure/rest periods; avoid nutrient enrichment in meadows.
Productive areas	Cropping plan, harvest log, CSA box log, mushroom/wasabi/microgreens records and irrigation log.	Vegetable/protected crop output within cautious planning range by Year 5; CSA remains small mixed-produce share.	Under-yield -> adjust crop mix/labour/rotation. Over-demand -> cap CSA. Water stress -> prioritise high-value/seedling/tunnel crops.
Invasive species	Monthly walkover April-September for Schedule 9 species and stock-safety weeds.	No Schedule 9 species established; control within 14 days of detection.	Detection -> isolate, control, record and prevent material movement.
Boxes and refugia	Annual late-winter check of bird/bat boxes, hibernacula, log piles and mammal-hole buffers.	Boxes/refugia present and maintained; mammal holes undisturbed.	Damage -> repair/replace; new protected-species evidence -> seek ecologist advice.

5.7 Adaptive Management, Connectivity, Biosecurity, Soil and Carbon

5.7.1 Wildlife corridor connectivity to the wider landscape

The Lower Wych holding contributes to wider ecological connectivity through four linked corridors and stepping-stone features identified in the baseline and PEA v2: the Wych Brook valley approximately 0.37-0.4 km to the north; the hedgerow network linking the holding to adjacent fields, woodland blocks and ponds; the adjcent Doley Wood and Meadows Local Wildlife Site, which extends contiguously beyond the western / south-western site boundary; and the new coppice blocks, pollinator strips and scrub-grassland mosaic that strengthen stepping-stone habitat through the holding. The on-site lowland mixed deciduous woodland section therefore forms part of a wider designated habitat corridor rather than an isolated woodland fragment. The management prescriptions for H1 are written to support both the on-site woodland section. Land-management prescriptions support corridor function by retain-

ing boundary hedgerows, avoiding light spill at habitat edges, increasing woodland-edge structural diversity, and maintaining rough-grass / scrub refugia for invertebrates and small mammals.

5.7.2 Invasive species and biosecurity

No problematic invasive non-native species were recorded by the PEA, but vigilance is required. All imported plants, seed, compost, mulch, woodchip, livestock and equipment will be inspected and, where appropriate, quarantined before introduction. Monthly walkovers in the growing season will check for Himalayan balsam, Japanese knotweed, giant hogweed, common ragwort where stock safety requires management, and other Schedule 9 species under the Wildlife and Countryside Act 1981 (as amended). Any Schedule 9 species detected will be controlled within 14 days using methods compatible with the holding's organic / minimal-input principles. Detection, control method and outcome will be recorded in the management diary.

5.7.3 Soil organic matter monitoring

Soil organic matter is the primary indicator of soil health and a proxy for soil carbon sequestration. The baseline established in November 2025 by the RHS Soil Analysis Service is 6.2% organic matter, classified as medium. Year-5 targets are 7.0-7.5% in the P1 vegetable beds, achieved through compost, mulches, green manures, no-dig bed management and livestock-manure integration; and a 0.3-0.5 percentage-point increase in G1 grazing pasture, achieved through rotational low-density grazing, manure cycling and rest periods. Repeat soil testing will be undertaken at Year 3 and Year 5 using the same RHS methodology where possible.

5.7.4 Indicative carbon sequestration

Land-management measures support an indicative Year-5 carbon sequestration estimate of approximately 1.5-3.0 tCO2e/year above baseline, comprising new coppice, orchard / soft fruit biomass and soil organic matter build-up across productive and grassland areas. These figures are indicative management estimates and are not relied upon as offsetting for operational or embodied carbon unless separately verified. The estimate will be reviewed at Year 5 against measured tree growth, soil analysis and any sequestration accounting methodology adopted by the OPD monitoring framework.

5.8 Implementation Programme and Annual Reporting

Table 5-23: Phased implementation programme

Phase	Section 5 implementation action
Pre-commencement	Insert / place the final baseline habitat plan and low-impact lighting plan; apply the confirmed / assumed-presence GCN position; prepare GI Statement, CEMP and GCN RAMS; mark RPAs, mammal holes, ponds and sensitive features on site; brief contractors on pollution prevention, nesting birds, dark corridors and stop-work procedures.
Year 1	Establish vegetable beds, polytunnel cropping, clean-water ponds, reedbed/polishing pond, initial orchard/soft-fruit planting, first hedgerow gap planting, hibernacula/log piles and baseline monitoring routes.
Year 2	Expand orchard/soft-fruit planting, establish wasabi and outdoor mushroom areas, complete pollinator strips, begin low-input rotational grazing where appropriate, and start new coppice block establishment.
Year 3	Review managed meadow / pasture response; undertake mid-term land-management review; adjust grazing/cutting; check coppice survival; review pond/irrigation performance; repeat EFA-linked monitoring where required.
Year 4	Refine productive and habitat systems based on monitoring; strengthen weak hedgerow/coppice/managed-meadow areas; review CSA and harvest pressure against land capacity.
Year 5	Five-year review: assess habitat condition, land-use areas, productive output, biodiversity indicators, water separation, grazing pressure and coppice establishment; prepare revised five-year management plan.

Monitoring records will be kept in a simple annual land-management file containing quadrat records, species notes, planting survival, pond and reedbed checks, irrigation records, grazing diary, coppice coupe records, soil tests, harvest logs and any corrective actions. The annual OPD monitoring return will summarise the relevant Section 5 indicators and explain any changes to management.

5.9 Conclusion

The Lower Wych land-management strategy is a combined productive and ecological plan. It protects the retained lowland mixed deciduous woodland section on the north-western / northern edge of the holding, together with hedgerows, mature trees, pond context and wider habitat connectivity, while converting lower-value grassland into a managed mosaic of rotational grazing / poultry pasture, wildflower meadow, pollinator strips, managed meadow / scrub-grassland refugia, orchard, coppice, clean-water ponds and wetland features.

The combined intensive horticulture, orchard, grazing and coppice prescriptions retain and intensify productive land-based use of the holding while protecting its ecological assets. The prescriptions actively respond to the Section 6 biodiversity duty under the Environment (Wales) Act 2016, address Habitats and Species of Principal Importance under Section 7, and contribute to the priorities of the Nature Recovery Action Plan for Wales for the Hanmer Grassland and Wych Valley landscapes. The chapter establishes the auditable basis for Section 5, aligns with the business plan, energy and water strategy, waste strategy and annual OPD monitoring, and supports the Year-5 review.

The strategy also makes the clean-water / greywater separation explicit: edible crops are irrigated only with harvested rainwater and clean runoff, while treated greywater is routed separately through the reedbed, polishing pond, infiltration and non-edible planting. Together, these measures demonstrate how the holding can provide food, livelihood, ecological enhancement, landscape resilience and low-impact land stewardship within one auditable management system.

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