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# PLANNING STATEMENT

West Midland Safari Park

Applicant: E.ON UK Heat Ltd.

Version 1.0

EXPERTISE | KNOWLEDGE | SUPPORT

## Document Version Control

## Revision Control Table

| Issue | Date | Change | Prepared | Approved |
|---|---|---|---|---|
| 1.0 | 09/23 | PS Report Compiled | CPD | BL |
| | | | | |
| | | | | |
| | | | | |

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## Proprietary Statement

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## Document Abbreviations

| Abbreviation | |
|---|---|
| WMSP | West Midland Safari Park |
| WFDC | Wyre Forest District Council |
| LPA | Local Planning Authority |
| NPPF | National Planning Policy Framework |
| LDP | Local Development Plan |
| SPG | Supplementary Planning Guidance |
| PS | Planning Statement |
| PV | Photovoltaic |
| GM | Ground-Mounted |
| kW | Kilowatt |
| MW | Megawatt |
| GRP | Glass-reinforced Plastic |
| DNO | Distribution Network Operator |
| DRP | Decommissioning and Restoration Plan |
| ZTV | Zone of Theoretical Visibility |
| GLVIA3 | Guidelines for Landscape and Visual Impact Assessment 3rd Edition |
| LI | Landscape Institute |
| IEMA | Institute of Environmental Management and Assessment |
| LCA | Landscape Character Area |
| LCT | Landscape Character Type |
| VP | Viewpoint |
| LB | Listed Building |
| SM | Scheduled Monument |
| CA | Conservation Area |
| WFDC CO | Conservation Officer for Wyre Forest District Council |
| WCC AAS | Worcestershire County Councils Archive and Archaeology Service |
| AIMS | Arboricultural Impact & Method Statement |
| BNG | Biodiversity Net Gain |
| ECoW | Ecological Clerk of Works |
| G&G | Glint and Glare |
| TMP | Traffic Management Plan |
| HGV | Heavy Goods Vehicle |

## Document Attachments

| Document Title | Description |
|---|---|
| Appendix 2.1 | Location Plan |
| Appendix 2.2 | Supplementary Location Plan |
| Appendix 2.3 | Detailed Site Plan A |
| Appendix 2.4 | Detailed Site Plan B |
| Appendix 2.5 | Cable Route |
| Appendix 2.6 | GM PV Elevation Plan |
| Appendix 2.7 | Storage Container Elevation Plan |
| Appendix 2.8 | GRP Unit Elevations |
| Appendix 2.9 | Discounted Sites |
| Appendix 5.1 | Excluded ZTV |
| Appendix 5.2 | Landscape Designations |
| Appendix 5.3 | Visual Assessment Location Plan |
| Appendix 5.4 | Landscape Proposal |
| Appendix 5.5 | Arboricultural Impact & Method Statement |
| Appendix 6.1 | Historic Environment |
| Appendix 6.2 | Winterdyne Co-Visibility |
| Appendix 6.3 | Wassell Wood House Co-Visibility |
| Appendix 6.4 | Hoarstone Farmhouse Co-Visibility |
| Appendix 6.5 | Church of St Anne Co-Visibility |
| Appendix 7.1 | Onsite Baseline Habitat Map |
| Appendix 7.2 | Onsite Post-Intervention Design Map |
| Appendix 7.3 | Offsite Baseline Habitat Map |
| Appendix 7.4 | Complete Post-Intervention Design Map |
| Appendix 7.5 | BNG Reference List |
| Appendix 10.1 | Transport and Access Plan |
| Appendix 10.2 | Draft Traffic Management Plan |

# 1. INTRODUCTION

## 1.1. Planning Application

This Planning Statement presents the proposed Ground-Mounted (GM) Solar array installation at West Midland Safari Park near Bewdley.

The Statement is being submitted as part of a Planning Application seeking full consent under the Town and Country Planning Act (as amended) 1990 and the Town and Country Planning (Development Management Procedure) (England) Order 2015.

Following a request for a screening opinion under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 submitted to Wyre Forest District Council (WFDC) in May 2022, the Local Planning Authority (LPA) confirmed that the development would not be subject to an EIA. As such, this Statement thoroughly examines the potential impacts of the proposal on various aspects of the environment, an appraisal against planning policy and guidance, with detailed plans submitted illustrating the development seeking permission.

## 1.2. Development Site

Proposed development is located at the following site:

**West Midland Safari Park, Bewdley, Worcestershire, DY12 1LF**

The application site, as detailed on submitted plans, is referred to as 'the site' throughout this statement.

## 1.3. Applicant Information

Cogeo Planning and Environmental Services Ltd. has prepared this Statement on behalf of the applicant, E.ON, in association with the Safari Park itself. As one of the most popular attractions in the country with numerous visitors throughout the year, the park is a busy and evolving environment. With various attractions at the park, including wildlife, eateries, an amusement park and lodges for overnight stays, the energy demand at the site is very high. Given the nature of the site and the parks 'duty of care for the environment', an appreciation of sustainability and conservation is recognised and advertised. As part of the parks Sustainability Policy and Green Target Actions and Achievements, recognition of the sites energy use is clear, with steps already taken to tackle and minimise their carbon footprint. Through the adoption of a small PV array at an animal house, and replacement of an oil heating system in the giraffe house with a biomass boiler, the Park are actively seeking alternative energy sources to replace fossil fuel systems to the benefit of the site and wider environment.

With such a significant energy demand at the park, E.ON were approached to design a low-carbon solution to offset that drawn from the grid, whilst providing a degree of future energy security. In recent years, E.ON have been working alongside numerous organisations, designing and installing renewable and low carbon energy generator projects to address the energy crises affecting businesses of all scales. Working alongside RZSS Edinburgh Zoo, Cogeo and E.ON have recently gained planning permission for a ground-mounted array on open ground within the Edinburgh City Greenbelt which will significantly benefit the business and the hosting environment. Through site investigations and detailed appraisals, an area of open ground within the Safari Park was recognised as a potential to host a ground-mounted solar array for onsite renewable energy production. As a joint venture, the array will be installed and maintained by E.ON, with the electricity used onsite at the park for various operations.

# 2. PROJECT DESCRIPTION

## 2.1. Site Description

The proposed solar array is located on an area of open ground at the West Midland Safari Park (WMSP). The array will be positioned on currently vacant green space to the north of the park, near the offices and staff car parking facilities. Access to the site is gained via the main park entrance off Kidderminster Road (A456) at the northern extent of the Safari Park.

Situated on the western outskirt of the urban landscape of Kidderminster, the proposed site lies within an area bounded with established vegetation. Given land use and onsite activities, the entire site has existing screening in place which significantly restricts views towards the park from the surrounding road network and town. Opportunities for site and boundary enhancement has been investigated for this proposal and is set out later in this statement.

Located approximately 700m east of the outskirts of Kidderminster and 4.3km north of Stourport-On-Severn, the land earmarked for development is positioned to the north of the Safari Park, south of the A456. Appendix 2.1 illustrates the location of the development site in the wider context of the landscape.

## 2.2. Site Selection

A number of site constraints have been accounted for during the design stage of this development. Following desk-based and on-site assessments, the location of the proposed array is at the most suitable position within the site, optimising available ground for development. Table 2.1 highlights the features which have been taken into consideration when siting this development.

Table 2.1 Site Considerations

| Feature | Constraint |
|---|---|
| Onsite Operations | As a busy safari park housing a number of animals, with hundreds of daily visitors to the site, any development proposed cannot obstruct ongoing operations. The area outlined for development is unused ground, set-back from sensitive parties[1]. A GM array at this position will not affect day-to-day workings at the park, optimizing existing infrastructure and vacant land. |
| Access | Access to the site will be gained via existing vehicular access tracks through the park. Internal tracks throughout the park will be used, with no upgrading works required. |
| Security | Located to north of the park, the area outlined is inaccessible by members of the public. Adjacent to the site offices, staff car park and storage area, fencing demarks the boundary of the site. Fencing will remain in-situ, with CCTV columns adopted to oversee the array to restrict and deter unauthorized access. |
| Panel Shading | With large established trees throughout the park, the potential for shading on the array significantly restricts development. Whilst vegetation can be managed, given the parks mission statement to conserve species and protect their habitats, removal is avoided and is a last resort approach. At the proposed site, potential for shading is reduced, though vegetation maintenance will be required to ensure optimal panel efficiency. |
| Ecology & Habitat | Given the presence of ecologically sensitive species within the park, alongside areas of established habitat, development opportunities are reduced. Sensitive siting and design of the array on the open area of managed grassland, adhering to industry standards and best practices for notable species, minimizes potential negative impacts. Through the adoption of this renewable energy proposal, site enhancements will be undertaken in direct association with the array, with Biodiversity Net Gain proposals building on the park-wide strategy in place for immediate and future biodiversity goals. |
| Established Tree Cover | Established vegetation within the Park limits areas of development, with root protection zones accounted for throughout the design phase. Where cable trenching is required to deliver the connection between array and existing substation onsite, appropriate mitigation is detailed along with recognized best practice measures to be adopted during the construction stage of works. |
| Landscape & Visual Impact | With the array positioned low to the ground, at a maximum of 3.15m height above ground, impacts will be minimal. Located to the north of the site, away from accessible areas within the park, the array will largely be screened from views. Given scale and location, the development will not pose a significant of adverse effect to the baseline landscape and visual amenity of the area. |
| Historic Assets and Features | Recognised historic assets within the Park itself are noted, with the array setback from the large Spring Grove House. |

Through sensitive design and siting, the development has been refined to avoid or reduce any predicted environmental conflicts. Potential impacts associated with all stages of the development, from construction through to decommissioning, have been thoroughly analysed. Where necessary, mitigation measures have been designed into the development to alleviate any impacts as must as is feasibly possible, accounting for onsite and local constraints. Given the scale and

[1] Animals and Visitors

nature of the installation within the grounds of the Safari Park, impacts are envisaged to be minor and contained to the boundary of the site itself.

## 2.3. Development Specifications

The development is comprised of a series of ground-mounted solar panels with a combined generating capacity of up to 1MW. The photovoltaic (PV) panels will be arranged in rows, supported off the ground by a series of narrow metal frames, usually composed of aluminium. An elevation plan of the proposed panel design is attached as Appendix 2.6 for reference. General specifications of the proposed array are displayed in Table 2.1. In addition to the panels, the proposal includes inverters positioned within a storage container, buried cabling, a GRP substation unit and an electrical kiosk.

The array will generate green electricity to feed directly into the Safari Park, contributing towards the sites targets of becoming greener with reduced carbon emissions. Reliant upon renewable electricity, the site will significantly reduce its draw on the grid network. Owned and operated by E.ON with long-term agreements in place for the use of electricity generated onsite, West Midland Safari Park will be afforded a degree of future energy security.

**Table 2.1 Proposed Array Specifications**

| Specification | Detail |
|---|---|
| No. of Panels | 752 |
| Panel Type | Trina Vertex 695W |
| Highest Point of Array | 3.15m |
| Duration of Operational Life | 35 years |
| Design/Orientation | Southeast facing, mounted at 20° |
| Fixture Design | Tree system fixtures |
| Inverters | 4 x Solis-110K-5G-PRO |
| Inverter Unit | Standard Container Design, 2.44m W x 6.06m L x 2.44m H |

## 2.4. Electrical Connection - Cabling

Electricity generated by the array will be used by the safari park to offset the requirement for grid supplied energy, working towards a carbon-neutral business. Inverters will be installed within a containerised unit positioned alongside the access road, in close proximity to the existing substation within the Park (Appendix 2.7).

A substation unit is sought at the southern-most point of the array, providing the necessary electrical infrastructure to step-up the generation from the panels. New cabling will be installed from the array, via the substation to the existing substation within the wider boundary of the Park. Alongside the Park's substation, a small electrical kiosk is proposed to allow for additional electrical infrastructure. Both units required are anticipated to consist of standard GRP enclosures, finished in a dark green colour to blend into the surroundings of the site as per Appendix 2.8. Cabling will be buried up to a maximum of 1m below ground as per the submitted Site Plans, following the most direct, and least impactful route. Appropriate installation methods will be adopted in accordance with best practice guidance.

## 2.5. Security and Access

Fencing encompassing the site will remain to ensure access is restricted to only those authorised personnel. Whilst the area is inaccessible to the general public, habitat management and landscaping around the site will be scheduled to further discourage encroachment on the site. To limit effects to amenity and biodiversity/wildlife, it is foreseen that lighting will be limited during the construction phase, with no long-term lighting onsite following commissioning. Any lighting used during the construction phase will follow best practice guidelines, with spill contained with hooded attachments.

Access will be gained via existing tracks and roadways throughout the park, with all vehicles associated with the development entering and existing via the main junction off Kidderminster Road. Vehicular access and management is discussed in detail in Chapter 10.

## 2.6. Site Compound

To accommodate the workforce charged with the construction of this project, a temporary site compound will be set aside within the park. Positioned at the northwestern corner of the site to the north of the park, the compound will form the base for all employees during the build-phase of works. Welfare units will be delivered to the site alongside storage containers. These components will be temporary and removed from the site once the array and electrical equipment have been commissioned.

Tools and machinery will be stored securely within the compound and park at the end of every day.

Vehicles will be parked in the site staff car park, with additional parking available within the wider park. No additional parking for the construction/operation/decommissioning of the development with sufficient capacity onsite.

## 2.7. Duration of Development

Solar energy developments, as standard, seek planning permission for an operational lifespan of 30-35 years. This application seeks permission from WFDC for an operational period of 35 years from the date of commissioning. Upon the completion of its working life, the development will be removed in line with standard decommissioning requirements. The development is fully reversible at the end of its operational lifespan and as such, any impacts are short-term, wholly reversible and non-permanent.

## 2.8. Construction Phase

Given the scale of development, the construction phase is estimated to run for approximately 15 weeks. This includes all site preparation works, delivery of components, installation and commissioning of equipment. Timescales are dependent on the weather, and such forces of nature are outwith the control of the applicant and developer. Furthermore, electrical connection will be subject to timescales dictated by electrical engineers and the Contractor. It is hoped that the electrical commissioning of the project will be scheduled, where possible, to fall in line with the completion of construction works onsite.

Following the commissioning of the array and electrical infrastructure, all machinery and tools used during the construction phase will be removed from the site. The area will be cleared of equipment and a walkover undertaken to ensure no debris or parts have been left behind. Once erected, the panels will allow ground vegetation to regrow. Erected on vacant grassland on the camping grounds, the site is regularly managed however sufficient reduction in initial

management will be required to encourage regrowth onsite. Further habitat management measures are detailed within the ecological chapter of this statement.

## 2.9. Operational Phase

### 2.9.1. Maintenance Requirements

Once operational, the array will be monitored to ensure the safe and efficient operation of equipment. Annual service visits will be completed by engineers with maintenance visits undertaken as and when required to address any faults or damages recorded. Panels will be washed throughout the year to remove dust and debris (e.g., leaves, bird droppings) to maintain system efficiency. As standard, engineers attending the site will use maintenance vans, entering and remaining onsite for approximately one day.

### 2.9.2. Decommissioning

Provision for the development to be decommissioned will take place on the expiration of the planning permission (35 years after the commissioning of the array onsite). The site will be restored within 6 months of this time unless planning permission is sought for the extension of the operational period. Any application for extension will be done in accordance with the legislation and regulations at the time of applying. If an extension for operation is not sought, then it is common practice for all equipment which is above ground to be removed from the site completely after having been dismantled.

The decommissioning phase follows a reversal of the construction phase. All electrical connections will be cut, cabling removed from ducting and recycled. Disassembled parts can mostly be recycled, taken to a suitable recycling plant, or another option would be for decommissioned components to be refurbished and sold on. It is difficult at this time to determine how the infrastructure will be treated once removed; this can be confirmed closer to the time.

A full Decommissioning and Restoration Plan (DRP) will be compiled prior to the expiration of the planning permission at this site if deemed necessary. This DRP will outline the actions required to remove the array and associated infrastructure, followed by the restoration of the site to the same, or better state than pre-construction. Once a Contractor/Project Manager has been charged with the removal of this installation, any DRP will be followed to ensure minimal impact to the surrounding landscape. No harmful substances will be released to the environment and the site will be restored to its pre-developed state (or enhanced).

Should the Park or Array Operator determine that additional generation opportunity lies with the proposal following the expiration of the permitted period, steps may be taken to seek an extension of operational permission for the array, or an application made to repower the site. Any application for such works will be undertaken to the planning regulations at that time, with policy constraints accounted for.

## 2.10. Project Progression

Upon deciding to adopt this renewable energy installation at their estate, the applicant sought professional design input for the proposed development. Following site investigation works, it was determined that the site has the potential for the installation of a small ground-mounted solar PV array with no impact to existing operations.

### 2.10.1. Alternative Sites Considered

Consideration was given for various renewable generation opportunities within the Park, with roof-mounted array installations investigated. Surveys undertaken on the existing buildings within the Park confirmed structural stability and available roof-space were insufficient and/or unsuitable for large scale roof-mounted installations. Whilst a small array has been installed at an animal house within the Park, multiple small-scale proposals throughout the entirety of the site would not offer the required generation capacity to make a significant contribution to the Parks demand. Furthermore, to complete the array installations would involve the relocation of various animals throughout the construction phase which would be unsuitable and unviable. Larger buildings within the site were reviewed, though again, adoption of roof-mounted arrays was not deemed feasible at this stage.

Open ground elsewhere within the Park, including enclosures were also surveyed, however when accounting for installation and maintenance works, alongside health and safety considerations and impact to the tourist attraction, no suitable area was outlined. Consideration was given to the open area of grassland fronting the large Spring Grove House; however, given the properties use for large events, including weddings and functions, the existing use and its historical and business value to the local economy, the area was deemed unsuitable. Ground encompassing the car park was considered, however during peak periods, these areas are used for overflow parking; again, valuable for the business and its contribution to local tourism. Whilst this area was deemed unsuitable for panels, biodiversity enhancements are to be undertaken along the car park boundary to improve habitat.

Appendix 2.9 illustrates the areas investigated for development and discounted for various reasons. Significant efforts have been made by the Applicant and Park with engagement on current and future land use throughout the park. This application has been built on lengthy discussions held between parties, with the project evolving to its current design and form following site surveys, project meetings and energy profiling. The area outlined for development is considered, appropriate and offers opportunity with minimal impacts to the site, its residents and visitors.

Positioned adjacent to the area designated as the WMSP Previously Developed Sites in the Green Belt (**Policy SA.PDL**), the open ground could accommodate the well-sited and considered array which would enhance operations within the Park, significantly reducing costs whilst securing future onsite supply. The site is strongly delineated by the security fencing and woodland, and is associated with and clearly encompassed within the Safari Park setting. With onsite generation offsetting grid-supplied energy, safeguarding the business from energy price fluctuations and market forces, the financial savings provided allows for reinvestment into the popular tourist attraction.

# 3. RELEVANT PLANNING POLICY

## 3.1. Introduction

To ensure a suitably designed and acceptable development, consideration of a number of relevant policy and guidance publications have been consulted. These range from strategies and guidance documents from Government level, down to regional and local authorities.

## 3.2. European Targets

Under the EU Directive 2009/28/EC, member countries of the European Union were obliged to draft, and submit to the European Commission, National Renewable Action Plans outlining pathways that will allow them to meet their 2020 renewable energy targets. In 2010 the UK Government compiled its own National Renewable Energy Action Plan detailing a set of measures that would enable the country to meet its 2020 target[2]. Targets included a 15% share of energy to be generated from renewable sources in gross final energy consumption, alongside a 31% of electricity demand being met by electricity generated from renewable energy sources. The European Commission's Renewable Energy Directive proposed a new set of targets in July 2021 intended to accelerate renewable usage and aid the objectives set for 2030. The new target looks to increase usage of EU renewable energy sources to 40%', and whilst the UK is no longer a member state, progress towards a cleaner, greener energy future is a notable feat for all countries.

## 3.3. National Legislation and Policy

Documentation published stresses the UK Governments belief that climate change is one of the gravest threats faced, with urgent action needed at home and abroad. Renewable energy must play a significant part in efforts to address climate change and reduce greenhouse gases.

A national drive towards a reduction in greenhouse gas emissions resulted in the publication of many targets and associated policies. The Climate Change Act 2008 presented the UKs commitment to an 80% reduction in greenhouse gases by 2050, with a 34% reduction in CO2 by 2020 (against 1990 levels). As part of the Act, Government investment was committed to encourage business and industry confidence in the renewables market. The act was amended in 2019 to commit the UK to 'net-zero' by 2050 and in 2021, the UK published its Sixth Carbon Budget, imposed by the Carbon Budget Order 2021, which aims to reduce greenhouse gas emissions by 78% by 2035 compared to 1990 kevels, to keep the country on track towards this 2050 target.

The Energy Act (2008) followed as a means of implementing the legislative aspects of the Energy White Paper (DECC, 2007), supporting the long-term delivery of energy and climate change strategies set.

The UK Renewable Energy Strategy 2009 white paper outlines how the UK would meet its legally-binding target to ensure 15% of its energy comes from renewable energy sources by 2020. Publication of this white paper in response to the Climate Change Act 2008 set forth key measures to achieve the targets set. These included financial support for all scales of renewables installed aimed to encourage deployment. A dedicated Renewable Energy Deployment

[2] National Renewable Energy Action Plan for the United Kingdom, Article 4 of the Renewable Energy Directive 2009/28/EC: https://www.iea.org/media/pams/uk/PAMs_UK_NREAP.pdf

department was created within the Department of Energy and Climate Change (DECC) to take forward the commitments outlined within the strategy.

The UK Renewable Energy Roadmap followed (updated 2013), detailing a series of measures to meet the legally-binding targets set within the Climate Change Act 2008. With the roadmap setting a target of 30% of UK electricity being generated from Renewable Sources, solar technology was envisaged to make a significant contribution to the energy mix.

The UK Government also made wider commitments under the United Nations Framework Convention on Climate Change and the 2015 Paris Agreement. Though the UK is no longer a member of the EU or European Environment Agency (EEA) following Brexit in December 2020, a full suite of updated or replacement Policies, Acts or targets have yet to be released. It is unclear how the UK Government will modify or implement changes to its climate laws or policies in the wake of Brexit, however renewable energies will remain key to the transition to a low carbon future to address significant adverse climate change fears.

The support for renewable energy deployments succeeded over the years during which schemes such as Feed-in Tariff (FITs), Renewable Obligations (RO), Contract-for-Difference (CfD), Renewable Heat Incentive (RHI) and Climate Change Levy (CCL) were in place. Unfortunately, following severe cuts in tariffs and complete withdrawal of schemes, uncertainty in the market has slowed development in the UK. Furthermore, policy changes have adversely affected the deployment of schemes, seriously hindering the countries chances of meeting the targets set within earlier policies.

## 3.4. Planning Framework

This application is submitted seeking full planning permission for the West Midland Safari Park solar array under the Town and Country Planning Act 1990 (as amended). As per the Planning and Compulsory Purchase Act (2004), the application is to be determined against the Development Plan in place within the Local Planning Authority (Section 38(6)).

The Town and Country Planning (Development Management Procedure) (England) Order 2015 details the required information necessary for a planning application for permission:

a) a plan which identifies the land to which the application relates;
b) any other plans, drawings and information necessary to describe the development which is the subject of the application.

National Planning Policy Framework (update published 20th July 2021) sets out the Government's planning policies for England and how they should be applied at a local level. As detailed within the NPPF, there is a presumption in favour of sustainable development within England. Local Planning Authorities (LPA) should "provide a positive strategy for energy from these sources (i.e. renewable and low carbon energy and heat), that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts)"[3]. NPPF also stresses that when determining planning applications for renewable and low carbon developments, LPA's should not require applicants to demonstrate the overall need for the development, but "recognise

[3] Ministry of Housing, Communities & Local Government; National Planning Policy Framework, 2021: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions" and therefore working towards targets set.

## 3.5. Environmental Impact Assessment

The Environmental Impact Assessment (EIA) process in the context of town and country planning in England is governed by the Town and Country Planning (Environment Impact Assessment) Regulations 2017. The aim of EIA's is to protect the environment by ensuring that a local planning authority when deciding whether to grant planning permission for a project, which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision-making process. A screening opinion request was submitted to Wyre Forest District Council for consideration and was determined not to require an EIA.

## 3.6. Pre-Application Consultation

Prior to submission, the Planning Authority required the submission of a pre-application consultation request to allow engagement with the Planning Department in relation to local policy constraints. Whilst the development site is located within the boundary of the Safari Park, the area outlined for the array is classified as Green Belt. As such, the LPA requested pre-application engagement to ensure the proposal sought adhered to the provisions of the policies within the Local Plan and wider NPPF, as a sustainable form of development.

It is understood that as the site is within the Green Belt, applications are assessed in a two-stage process; firstly, whether the development constitutes appropriate development within the Greenbelt, and then if deemed inappropriate, whether any special circumstances exist to overcome the harm posed by the proposal.

An onsite meeting held by the Applicants, E.ON, hosted by the Projects Team at WMSP, allowed parties to discuss the development and its potential impact to the Greenbelt designation and wider landscape. E.ON have recently succeeded in gaining planning approval for the installation of a ground-mounted solar array within the Greenbelt designation of Edinburgh City, at the RZSS Edinburgh Zoo. Providing power to the existing zoo, the array was deemed to be ancillary development covering just over 1ha within the wider site of approximately 33ha. The Authority considered the array an appropriate scale which did "not detract from the landscape quality and/or rural character of the area", in accordance with their policy for Development in the Greenbelt and Countryside[4]. In accordance with the WFDC LDP and NPPF criteria, the Planning Officers attending the meeting onsite requested the clear outlay of the 'very special circumstances' relating to the development sought at the WMSP. For clarity, these considerations are discussed in detail in Section 3.9.1.

## 3.7. Climate Emergency Declaration

In 2019, like many Authorities, Wyre Forest District Council declared a Climate Emergency, with an aim to achieve Net Zero emission credentials by 2050. "A Climate for Change" plan sets forth the aims and responsibilities that the Authority deems achievable under their control or influence. Within these targets, there is support or encouragement of renewable energy measures at a domestic scale, with investigations for Council-owned renewable energy generation opportunities also. Whilst this proposal is sought at the local attraction of WMSP, the contribution it will make towards local carbon reductions for the region are a significant positive in terms of Climate Change planning. It is therefore strongly argued

[4] Proposal: Installation of a ground-mounted solar array and associated infrastructure at Edinburgh Zoo, Planning Reference 21/06721/FUL

that this development contributes to the urgent need reflected in National and Local Policies for reducing carbon emissions to limit the damaging impacts of climate change.

## 3.8. Wyre Forest District Council Local Plan

The development site and wider West Midland Safari Park is covered by the Wyre Forest District Council Local Plan 2016-2036[5]. Adopted in April 2022, the Local Plan sets out the Authorities long-term vision and strategic context for managing and accommodating growth within the district to contribute to the achievement of sustainable development.

The Local Plan recognises Sustainable Development Objectives, through an economic role by ensuring there is:

i. *" sufficient land of the right type is available in the right locations and at the right time to support economic and social growth and innovation.*
ii. *Identifying and co-ordinating development requirements, including the provision of infrastructure"*

Also accounting for their environmental role, by:

i. *" Making effective use of land.*
vii. *Protecting and enhancing green infrastructure.*
viii. *Mitigating and adapting to climate change and flood risk, including moving to a low carbon economy and reducing flood risk and wastewater through water management."*

As per the Local Plan, the Authority will support the "*transition to a low carbon future in a changing climate. It supports ways that contribute to radical reductions in greenhouse gas emissions, re-use of existing resources, low carbon energy and associated infrastructure in conformity with the NPPF*"[6]. Table 3.1 details those policies within relevant guidance documents consulted through the siting and design stages of this project.

[5] https://wyreforestdc-consult.objective.co.uk/kse/event/36887
[6] Wyre Forest District Council Local Plan 2016-2036. Chapter 16

**Table 3.1 Local Policies Pertaining to the Proposed Development**

| Policy Document | Policy |
|---|---|
| Wyre Forest District Council Local Plan 2016-2036 | Policy SP.2 Locating New Development<br>Policy SP.7 Strategic Green Belt Review<br>Policy SP.19 Sustainable Tourism<br>Policy SP.20 Quality Design and Local Distinctiveness<br>Policy SP.21 Historic Environment<br>Policy SP.22 Landscape Character<br>Policy SP.23 Protecting and Enhancing Biodiversity<br>Policy SP.32 Sustainable Drainage Systems (SuDS)<br>Policy SP.37 Renewable and Low Carbon Energy<br>Policy DM.19 – Supporting Major Tourist Attraction<br>Policy DM.22 Safeguarding the Green Belt<br>Policy DM.23 Safeguarding the Historic Environment<br>Policy DM.24 Quality Design and Local Distinctiveness<br>Policy DM.26 Landscaping and Boundary Treatment<br>Policy SA.PDL Previously Developed Site in the Green Belt |

## 3.9. Local Plan Policy Analysis

As will be shown throughout this planning statement, the development presented for consideration complies with all relevant local policies and conforms to guidance. Policies noted in Table 3.1 are assessed in the following section and whilst not all subsections of each policy are relevant to this development, those applicable are discussed.

Through sensitive design and siting, it is deemed that the development presented at West Midland Safari Park complies with the aims of Wyre Forest District Council.

As per **Policy SP.2 – Locating New Development**, the proposals within the Greenbelt will be considered in accordance with national policy set out in the NPPF, alongside SP.7, SP.8[7], DM.2, DM.22, and SA.PDL of the Local Plan. WMSP falls into various policy constraints, with the development site itself deemed to be Greenbelt. Alongside the boundary of the outlined development area for the array, the land is recorded as Previously Developed Sites in the Green Belt[8], subject to Policy SA.PDL.

### 3.9.1. Green Belt Designation

As per the Local Plan and discussions held with the Planning Officers during pre-application for this development, it is noted that the development site outlined falls within the Greenbelt. As such, significant protection is given to the area, with development subject to strict assessment criteria. By definition, a ground-mounted array would be considered 'inappropriate', as per **NPPF Paragraph 151**:

*"When located in the Green Belt, elements of many renewable energy projects will comprise inappropriate development. In such cases developers will need to demonstrate very special circumstances if projects are to proceed. Such very*

[7] Policy SP.8 – Reserved Housing Sites in the Green Belt, irrelevant to this development and therefore omitted from study
[8] https://wyreforestdc-consult.objective.co.uk/kse/event/36887/section/ID-5855428-30#ID-5855428-30

*special circumstances may include the wider environmental benefits associated with increased production of energy from renewable sources."*

**Strategic Green Belt Review, Policy SP.7** dictates that there is a general presumption against inappropriate development within the Green Belt, with such development refused unless '*very special circumstances exist*'. Again, development will be considered against relevant NPPF policy, alongside **Policy DM.22 – Safeguarding the Green Belt**. Whilst it is acknowledged that the greenbelt plays an important role in preventing urban sprawl, in certain circumstances there may be a need to locate development in the most sustainable location, where there is easy access to existing services, facilities and supporting infrastructure. In this instance, the ground-mounted array is proposed within the grounds of the WMSP for the sole purpose of providing onsite green energy generation to offset that drawn from the network to fulfil onsite demand and operations. Given footprint, it would not be feasible to locate the development anywhere else and is therefore deemed a sustainable location. This proposal does not seek the removal or destruction of the greenbelt and is a temporary installation which can be wholly removed from the site following decommissioning. As per the NPPF (para. 134), the purpose of the Green Belt is defined by five criteria, as follows:

National Planning Policy Framework (para. 134) defines the purpose of Green Belt via five criteria:

- to check the unrestricted sprawl of large built up areas;
- to prevent neighbouring towns merging into one another;
- to assist in safeguarding the countryside from encroachment;
- to preserve the setting and special character of historic towns; and
- to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.

As per WFDC's Green Belt Study, the "*Green Belt does not therefore have a landscape protection role*"[9].

Of considerable note for this proposal, alongside the Greenbelt classification, is **Policy SP.37 – Renewable and Low Carbon Energy**. As per the Local Plan, the Council "supports the transition to a low carbon future in a changing climate. It supports ways that contribute to radical reductions in greenhouse gas emissions, re-use of existing resources, low carbon energy and associated infrastructure in conformity with the NPFF"[10]. Proposed on open ground within the Safari Park, the array is sought to generate renewable electricity for use within the wider site, offsetting that drawn from the national grid network. With all energy generated to be used within the Park, the efficiency of the array is significantly enhanced, with losses experienced when transporting electricity over distance is reduced. The site outlined for development is heavily managed, mown regularly limiting the sward, with small areas of planting providing feed for animals within the Park. Given its management, the ground does not offer rich habitat or amenity value. Alongside the adoption of the array, it is proposed that the area is incorporated into the wider site biodiversity net gain, enhancing the value and attractiveness of the open field. With the fixtures designed to minimise ground impacts allowing removal following decommissioning, overall long-term effects are negligible with no loss of, or damage to the baseline conditions.

Surveys undertaken on the existing buildings within the Park confirm structural stability and available area is insufficient and/or unsuitable for large scale roof-mounted installations. Open ground elsewhere within the Park, including enclosures were also surveyed, however when accounting for installation and maintenance works, alongside health and

[9] http://archive.wyreforestdc.gov.uk/local-plan-(2016-2036)-background-documents/local-plan-background-documents-green-belt.aspx
[10] Wyre Forest District Local Plan (2016-2036)

safety considerations and impact to the tourist attraction, no suitable area was outlined. Consideration was given to the open area of grassland fronting the large Spring Grove House, however given the properties use for large events, including weddings and functions, the existing use and its value to the business and local economy was deemed to outweigh its loss. Ground encompassing the car park was considered, however during peak periods, these areas are used for overflow parking; again, valuable for the business and its contribution to local tourism. Positioned adjacent to the area designated as the WMSP Previously Developed Sites in the Green Belt (**Policy SA.PDL**), the open ground could accommodate the well-sited and considered array which would enhance operations within the Park, significantly reducing costs whilst securing future onsite supply. The site is strongly delineated by the security fencing and woodland, and is associated with and clearly encompassed within the Safari Park setting. With onsite generation offsetting grid-supplied energy, safeguarding the business from energy price fluctuations and market forces, the financial savings provided allows for reinvestment into the popular tourist attraction.

To reiterate, in this instance, it is considered that the following points present the '*very special circumstances*' for this development within the Green Belt:

- Adoption of renewable energy generation, significantly reducing onsite greenhouse gas emissions, contributing towards meeting carbon reductions.
- Production of energy from an abundant renewable source at a high demand site, allowing reinvestment elsewhere within the Park.
- Alternative siting options within the park exhausted.
- Available ground will be enhanced through the addition of rich flora planting, on otherwise heavily managed and mowed grassland.
- Development would not result in the long-term loss or destruction of green belt.
- Energy security for future operations at one of the largest tourist attractions in the District.
- Proximity to end-user reduces energy loss, maximising efficiency of the development.

As a renewable energy project, it is acknowledged that the proposal presents an 'inappropriate development' within the Greenbelt. However, the creation of the renewable energy source results in wider benefits for the site, business and environment which are deemed to contribute towards 'very special circumstances', outweighing any resulting harm. The green power generation proposed is considered to meet the requirements of Paragraph 151 of the NPPF, complying with the requirements of the NPPF as well as **Policy DM.22**. On balance the resulting harm to the wider greenbelt designation, landscape openness and visual amenity is considered minimal and the balance is therefore in favour of this sustainable proposal.

### 3.9.2. LDP Policy Constraints

Recognised as a valuable tourist attraction of regional significance, the Safari Park is a notable asset to the region. **Policy SP.19 – Sustainable Tourism**, aims to protect and enhance existing facilities whilst safeguarding the quality of the environment, alongside **Policy DM.19 – Supporting Major Tourist Attraction**. Through the adoption of onsite generation, energy security is provided to the business, enhancing the future viability of the Park as a major attraction to the local economy. Set-back from the areas of attraction within the Safari Park, the array optimises available open ground whilst ensuring no loss of valuable or attractive assets offered to visitors. Furthermore, as per the criteria of these policies, developments will be supported where the character of the area is not adversely affected with no unacceptable impacts. Furthermore, **Policy SP.20 – Quality Design and Local Distinctiveness** and **DM.24 – Quality Design and Local Distinctiveness**, dictates that all developments sought must demonstrate high quality design, integrating effectively with its surroundings. Designed to follow the contours of the site, optimising otherwise unused ground along the edge of the

parkland, wholly encompassed by established trees and vegetation, the array will enhance onsite infrastructure through the adoption of green technology with no significant adverse effects to the wider park, not to mention encompassing landscape.

With a small number of Listed Buildings located within the parks wider boundary, **Policy SP.21 – Historic Environment** and **DM.23 – Safeguarding the Historic Environment** are of note. With distance and intervening land use, namely the leisure theme park and animal enclosures, impacts to heritage assets within the park and wider landscape are unaffected by the array proposed. The cable route runs through the open area of grassland at the large property of Spring Grove House, with best practice methods adopted during the burying of the cabling to minimise impact.

**Policy SP.22 – Landscape Character**, aims to protect and where possible, enhance the landscape of the district, with development accounting for the areas environmental quality and value. In combination **with Policy SP.23 – Protecting and Enhancing Biodiversity**, the natural landscape and its sensitive network of populations are protected. Existing established native tree species and vegetation at the site and encompassing Park will be unaltered, with no further landscaping or boundary enhancements required as per **Policy DM.26 – Landscaping and Boundary Treatment.**

Whilst the site is not deemed at risk of flooding, acknowledgement of policy **SP.32 – Sustainable Drainage Systems (SuDS)** is made, as the application seeks new development. As a greenfield site, filtration of percolation on the panels will continue to drain to the ground as it does pre-development. With minimal ground disturbance required given the minor invasive fixtures selected for this development, run-off and filtration rates will be unaffected, with no impermeable concrete designed into the proposal. As a result of the design and layout, no detailed SuDS design is necessary for this proposal.

# 4. ENERGY STATEMENT

## 4.1. Need for Development

As detailed within policy documentation, there is overall support for the deployment of renewable and low carbon energy. With a national drive towards increased energy generation from low carbon sources added to the energy mix, support for well-sited developments is encouraged through the backing of Local Authorities for appropriate, well-designed applications. Each development, regardless of scale or output should be viewed as a contribution towards the ambitious targets set at a local, regional and national level.

WMSP is striving to reduce their environmental impact, as well as reducing rising energy costs. As a large, popular tourist attraction within the District, energy demand at the site is very high. When accounting for the numerous visitor facilities offered at the Park, alongside the demand for utilities to ensure the continued welfare of all wildlife within the site, the draw on the network is significant. Energy price rises have been well-documented over recent months, with world-wide pressure further impacting availability and subsequent costs. Large attractions such as the West Midland Safari Park are not exempt from these costs and are impacted greatly by the pressures of such forces outwith their control. Positive action must be taken to ensure that the business remains competitive, with the adoption of onsite renewable energy generation contributing positively towards meeting carbon reduction targets, whilst also raising awareness of the technology to a vast audience of visitors.

## 4.2. Energy Figures and Cost Implications

Through the investment of installing a ground-mounted solar array at the Park, within close proximity to the end user, the site is afforded future energy security, safeguarded against ever-rising costs and fluctuations in pricing. With onsite generation, financially, the business will be able to forecast energy outlay, allowing reinvestment within the Park, ensuring continued high standards of animal welfare, alongside offering a unique and exciting visitor attraction to tourists.

Solar PV presents an excellent opportunity at WMSP, optimising currently open unused ground, which benefits from natural established screening from encompassing vegetation and abundant solar resource offered.

Detailed designs have been drafted by E.ON on behalf of WMSP, building on their current demand and energy consumption figures. WMSP have an electricity demand of 2,710,000kWh per year, with a load peak of 802kW.

The system presented to WFDC for consideration has an overall generation capacity of 464,590kWh. Given the significant demand within the Park, 98% of the energy generated by the solar array will be consumed onsite. Surplus energy generated by the array will be fed into the national grid network for wider distribution. With such a high demand at the site itself, only around 9,291kWh per year, or less, will be diverted onto the grid, exceeding onsite peak load. This emphasises that the array presented for consideration, is of a suitable scale to deliver the supply required, and is not beyond the scope of demand.

Accounting for current rates of demand and cost, E.ON have undertaken detailed due diligence for the development which suggests an annual financial saving of approximately £73,000 per annum. Like all businesses, WMSP have been impacted by the current energy crisis, with escalating prices putting pressure on the continued running of the Park. As previously discussed, the array will allow WMSP to decarbonise operations, save money and become more self-sufficient, especially on the energy front which is outwith their control. In turn, such factors will support the Park as a key local employer, regional tourist attraction and national wildlife conservation body.

## 4.3. Environmental Benefits

As stressed, with a reduced reliance on the national grid network for electricity, the site will benefit from energy security from onsite energy generation. By offsetting energy demand from the national grid network which itself remains largely supplied by fossil-fuelled or carbon-heavy generators, the site will in turn minimise its carbon footprint. Solar PV is an economical means of generating electricity whilst also presenting a minimal impact when sited and designed well.

The application is concerned with the need to support the transition to a low carbon future (which is one of the core planning principles of the NPPF) and the delivery of renewable and low carbon energy. The energy used during the manufacture of PV panels is far less than they will generate through their lifetime. Even with the UK's levels of sunshine, PV panels will 'pay back' this energy cost in less than three years which is a significant benefit of the technology. Utilising solar energy at the site to offset grid electricity will contribute positively towards targets set by the Government, providing the property with a supply enhancing the green credentials of the business.

Assuming a grid electricity emissions factor of 225.0g $CO_2$/kWh emissions per year, calculations undertaken during the design phase suggests that the array presented would result in 102,442kg/year $CO_2$ emissions being avoided. This is a significant contribution to the ambitious targets set for a reduced onsite carbon footprint not only for the Park itself, but also for the wider WFDC area.

Furthermore, the biodiversity enhancement opportunities to be adopted at the site alongside the array will work towards greater environmental gains for the Park and local area. The array will not only work towards reducing harmful carbon emissions through offsetting grid-supplied power but will also increase habitat value and diversity to the benefit of the environment.

# 5. LANDSCAPE AND VISUAL APPRAISAL

## 5.1. Introduction

The purpose of this appraisal is to ascertain the potential landscape and visual effects of the GM PV array proposed at West Midlands Safari Park, Bewdley. The development consists of thirteen (13) rows of PV panels erected on metal frames, alongside an electrical GRP kiosk & container; associated electrical kiosk; cable route; and 2no construction staging/set-down areas. Access is proposed through existing park roadways/tracks.

Landscape and visual impacts are considered separately within this chapter in accordance with published guidance, although the procedures for each are closely related. The distinctions between landscape and visual impacts are:

- Landscape impacts relate to the effects of the proposal on the fabric, character and quality of the landscape;
- Visual impacts relate to the effects on the character of views and the visual amenity experienced by receptors, such as residents, footpath users, tourists, and users of recreational facilities.

The LVA report considers the potential character and visual effects of the proposed development with no judgement on the significance of effects.

## 5.2. Policy and Guidance

The potential impacts of this development have been assessed in relation to the various guidelines published relative to Planning and renewable energy, however, refer mainly to:

**Policy, design, and assessment guidelines**

- Wyre Forest District Local Plan (2016-2036) - Adopted April 2022[11]
- Scottish Natural Heritage (SNH; 2017) '*Natural Heritage Considerations for Solar Photovoltaic Installations. Version 3*'[12];
- BRE National Solar Centre *'Planning Guidance for the Development of Large Scale Ground Mounted Solar PV Systems'* (2014)[13];
- BRE National Solar Centre *'Biodiversity Guidance for Solar Developments'* (2013)[14]
- Natural England Technical Information Note *'TIN101 Solar Parks: Maximising Environmental Benefits'* (2011)[15]

[11] WFDC: https://wyreforestdc-consult.objective.co.uk/portal/alp?pointId=5855474
[12] SNH (now NatureScot): https://www.nature.scot/sites/default/files/2018-01/Guidance%20-%20SNH%20solar%20PV%20guidance%20-%20November%202017.pdf
[13] BRE: https://www.bre.co.uk/filelibrary/pdf/other_pdfs/KN5524_Planning_Guidance_reduced.pdf
[14] BRE: https://www.bre.co.uk/filelibrary/pdf/Brochures/NSC-Biodiversity-Guidance.pdf
[15] Natural England TIN101: https://webarchive.nationalarchives.gov.uk/ukgwa/20150902191816mp_/http://publications.naturalengland.org.uk/file/102004

**Assessment and visualisation guidelines**

- Technical Guidance Note 06/19 Visual Representation of Development Proposals (Landscape Institute, September 2019)[16]
- Landscape Institute & Institute of Environmental Management & Assessment (LI-IEMA; 2013) '*Guidelines for Landscape and Visual Impact Assessment. 3rd Edition*' (GLVIA3) [17]

## 5.3. Assessment Methodology

Assessment has been carried out using a methodology that has been specifically devised by Cogeo for the landscape and visual assessment of renewable energy developments. This methodology accords with GLVIA3 and draws upon various industry accepted guidance. Whilst broadly based on GLVIA3, the process has evolved from assessments undertaken for alike, or similar, developments over several years.

Though GLVIA3 guides assessment away from the previously widely used 'matrix-based' approach, this appraisal continues to include this approach to allow for transparency of assessment. Utilising matrices allows readers to clearly understand how sensitivity of receptors and magnitude of change are combined to determine the magnitude of effect. Professional judgement is used throughout to ensure appropriate and robust assessment.

### 5.3.1. Assessment of Impacts

The potential effects of the proposed development on the landscape and visual resource are grouped into four categories: physical effects, effects on landscape character, effects on views and cumulative effects.

Physical effects are restricted to the development area, relating to the direct effects on the fabric of the site and its access, such as the removal or addition of trees and alteration to ground cover.

Effects on landscape character arise either through the introduction of new elements that physically alter the pattern of elements making up landscape character, or through visibility of the proposed development that may alter the way in which the pattern of elements is perceived. This category is made up of landscape receptors which are landscape character types or designated areas.

Effects on views are an assessment of how the proposed development will affect views throughout the study area. The assessment of effects on views is conducted in two ways:

- An assessment of the effects that the proposed development will have on views from the principle visual receptors, being the notable settlements, routes and attractions located within the study area; and
- An assessment of the effects of the proposed development will have on a series of viewpoints selected to represent visibility from across the study area.

[16]Landscape Institute, Tech Note 06/19: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf

[17] Landscape Institute & Institute of Environmental Management & Assessment (LI-IEMA; 2013) *Guidelines for Landscape and Visual Impact Assessment. 3rd Edition'*

**Cumulative effects**

There are no GM PV arrays within the local area which would be read alongside the proposed development. As such, no formal cumulative assessment has been undertaken with like for like development.

### 5.3.2. Zone of Theoretical Visibility (ZTV)

For this assessment, a ZTV based on a Digital Terrain Model derived from Ordnance Survey Landform Panorama data (10m height contours at a scale of 1:50,000), has been prepared using Resoft™ Windfarm software. Information is limited by the detail of the digital terrain model data available for use. Generated for receptors at a height of 1.7m, visibility has been calculated to the highest point of the array.

This ZTV (see Appendix 5.1) has been produced to account for both woodland and built structures within the local area to provide a more accurate representation of the likely impact and visibility of the array. The barriers, as considered by the software, are opaque and cannot account for variance in density of vegetation or the filtering of views. No individual trees, shrubs or other vegetation are accounted for within the modelling. Due to the low profile of the array, this is considered a more appropriate method of assessing likely visibility for certain aspects of the impact on landscape features rather than a 'bare earth' or 'worst-case' scenario ZTV. A bare earth ZTV has been produced and is provided for comparative research and assessment (see Figure 5.1).

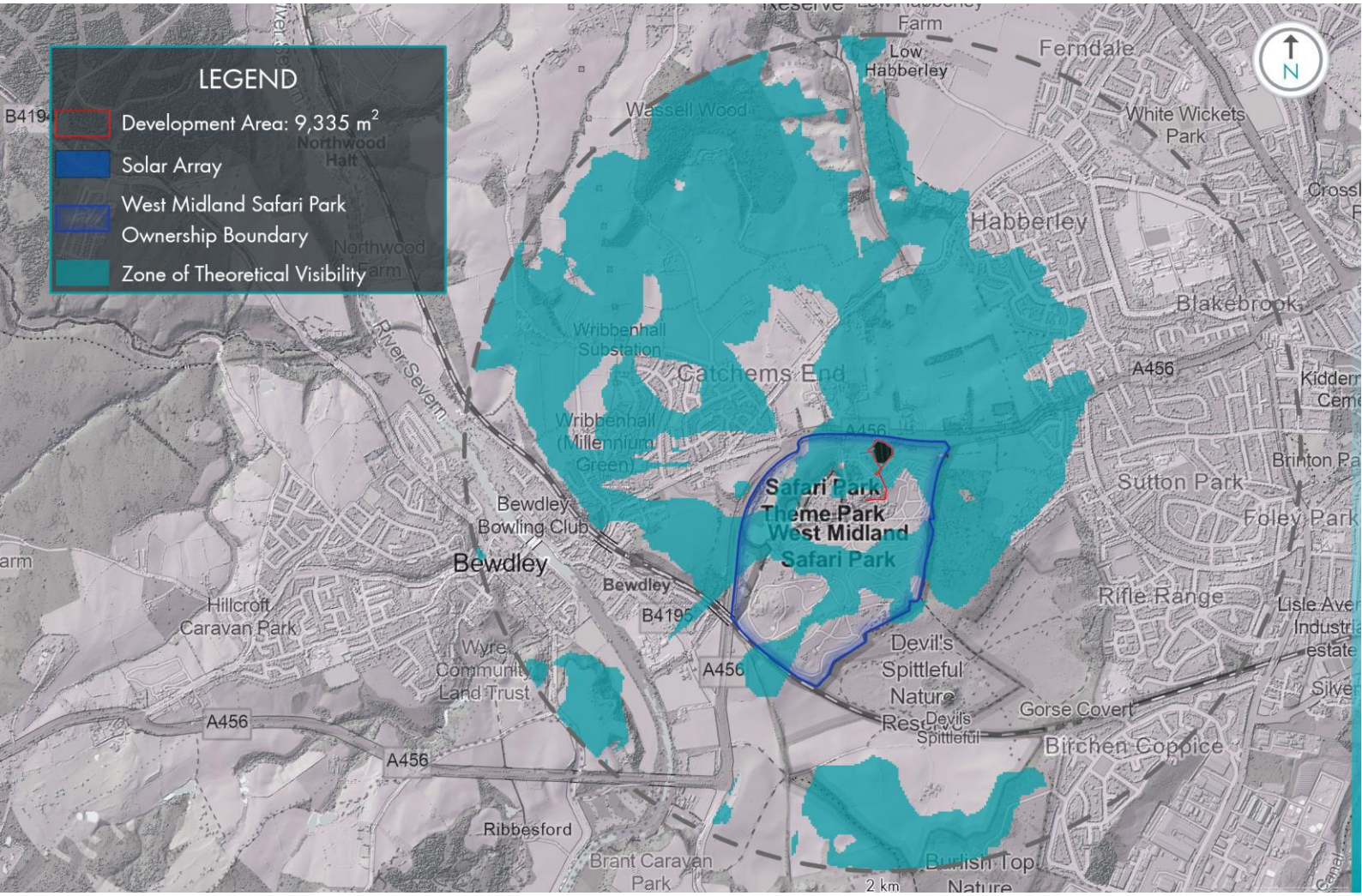



Figure 5.1 Bare Earth ZTV

Generated to demonstrate the potential visibility of a development, the ZTV assists in the design development and assessment process. The ZTV has been used as a means of identifying potential receptors (areas of land used by the public and individual/groups of buildings) so that appropriate impact assessments from identified receptor locations can be undertaken. It also assists in the assessment of impact on different landscape character types and designated sites as it indicates whether a view may be obtained in these areas.

It should be noted that ZTV maps do not consider orientation of viewers and may indicate a theoretical view that is outside of the actual angle of view afforded. Calculations also do not allow for the deterioration of visibility over distance, light or weather. As such, ZTVs tend to overestimate the extent of the influence of a development on the surrounding landscape and visibility and are therefore considered a tool to assist in assessment, it is not a measure of visual impact.

### 5.3.3. Study Area

A study area of 2km from the development position has been used for the baseline appraisal. This is deemed appropriate given the scale of development proposed and its potential influence over the wider landscape. This is demonstrated within the ZTV mapping provided, with large areas of the landscape afforded screening from the array due to topography, and natural/built form.

Beyond this 2km study area, it has been determined that development will not be a significant feature within wider views, posing negligible impact to existing views as the array will be visually absorbed within the wooded environment of the safari park, and where seen, read in conjunction with other park infrastructure.

This study area allows for a concentrated and worthwhile assessment of impacts within the local area, deemed appropriate and proportionate to the size and scale of the application and resultant potential effects.

### 5.3.4. Visualisations and Photographic Study

The effects of potential co-visibility between the proposed array and several local heritage assets have been assessed per screening responses from Wyre Forest District Council (WFDC).

Heritage assets and the potential impacts of development on feature and setting have been fully discussed in Chapter 6.

The effects upon landscape and visual receptors have been examined and analysed within the study area, or beyond as requested by WFDC for specific assets, with the creation of further targeted ZTV mapping which illustrates for each asset the extent of areas where co-visibility of asset and development may be viewed from.

Site/area targeted photography (photographic study) illustrates the characteristics of the areas adjacent to, and further afield from, the array site, notably Hoarstone Lane in an area of concentrated heritage assets and Kidderminster Road with vehicular and pedestrian users close to the proposed array.

Co-visibility includes for combined, successional, and sequential views where the viewer can see both elements together in one view and by turning on the spot/travelling to see elements individually. Resoft Windfarm™ software has been used for topographic modelling and accurate array siting. Terrain data is provided by Ordnance Survey.

### 5.3.5. Landscape Receptors

The assessment of potential landscape impacts includes the consideration of physical and perceptual changes in the character of the landscape that may result from the addition of the solar array at the safari park. The assessment of the level of impact takes into consideration both the sensitivity of the landscape character (nature of receptor) and the nature of effect (magnitude of change).

Sensitivity is the sensitivity of the National Character Area (NCA) to the loss or change of key features or land cover and its susceptibility to change. Value, integrity, and capacity are all relevant considerations when assessing the nature of receptor (sensitivity). Value relates to the scenic or aesthetic qualities, national, local, or regional designations, with integrity the degree to which value is retained. Capacity relates to the landscapes ability to accommodate change whilst retaining its defining character. Table 5.1 details the criteria used to define the nature of landscape receptors for assessment.

**Table 5.1 Nature of Landscape Receptor (Sensitivity)**

| | Definition |
|---|---|
| Negligible | Landscape areas already heavily developed and industrialised, unchanged by the introduction of additional development. |
| Low | Low value landscape with no level of designation.<br>Landscape is in poor condition with degraded character.<br>Identified in Landscape Character Study as being able to accommodate change without significant adverse impacts on baseline character. |
| Medium | Undulating landscape where the existing sense of scale may be affected by development of inappropriate scale or location.<br>Locally recognised landscape, though undesignated.<br>Identified in landscape study as having some sensitive key landscape characteristics, however able to accommodate development in some situations. |
| High | Landscapes containing sensitive and designated sites, such as Gardens and Designed Landscapes, National Scenic Areas.<br>Rare landscapes of high value with a distinct character.<br>Tranquil or remote landscapes noted to be vulnerable to change within Landscape Character Assessment. |

As noted within GLVIA3, the effect imposed on landscape receptors needs to be assessed in terms of its size or scale, the geographical extent of the area influences and its duration and reversibility.

### 5.3.6. Visual Receptors

Visual Receptors are those within the landscape, viewing the development from various vantage points throughout. Visual receptors are all people within the landscape, used to assess the visual effects of a development. Each visual receptor, meaning the person or group of people likely to be affected at a specific viewpoint, should be assessed in terms of both their susceptibility to change in views and visual amenity and also the value attached to particular views[18].

[18] GLVIA3

As discussed in 5.3.4 a specific range of visual receptors (heritage assets) have been pre-determined through Screening. These have been assessed through ZTV modelling to determine potential impact of co-visibility (when viewed combined with the proposed array) from surrounding locations.

Susceptibility of receptors to changes in views is mainly a function of the current occupation and viewing opportunity of people at a particular location, or locations, and the extent to which their attention or interest is focused on views and visual amenity. **Table 5.2** details the criteria used to determine the nature of visual receptors within assessment. The criteria provided is used as a guide and is not a strict rule. It may be that receptor sensitivity is lowered or elevated on a case-by-case basis, though if this occurs it will be discussed to provide transparency.

**Table 5.2 Nature of Visual Receptors (Sensitivity)**

| Criteria | Definition |
|---|---|
| Negligible | Views from towns, conurbations, and heavily industrialised areas. |
| Low | Those engaged in outdoor sports or recreation, other than for viewing (e.g. fishing, water sports, golf).<br>Those using major roads or motorways in the region.<br>Those engaged in commercial activity and transport or in education, whose attention is focused on their work or activity rather than the wider landscape. |
| Medium | Residential properties with secondary views from other rooms.<br>Walkers using secondary network of footpaths and tracks.<br>Transport users of local roads, train lines, rivers, and canals. |
| High | People who are engaged in outdoor recreation, whose attention or interest is focused on the landscape and on particular views (e.g. strategic footpaths, cycle routes or rights of way, picnic areas, public viewing areas).<br>Residential properties with principal views from main living rooms and gardens.<br>Important landscape features with physical, cultural, or historic attributes. |

### 5.3.7. Nature of Effects

The Landscape Institute provides guidance on the nature of effects (magnitude of change) in their publication GLVIA3 stating that "*effects can be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity*" (paragraph 3.22). Paragraph 5.37 adds:

"*One of the more challenging issues is deciding whether the landscape effects should be categorised as positive or negative. It is also possible for effects to be neutral in their consequences for the landscape. An informed professional judgement should be made about this and the criteria used in making the judgement should be clearly stated. They might include, but are not restricted to:*

- *The degree to which the proposal fits the existing character.*
- *The contribution to the landscape that the development may make in its own right, usually by virtue of good design, even if it is contrast to existing character*".

Similar advice is given in relation to visual effects in paragraph 6.28 of GLVIA3, stating that:

*"As with landscape effects an informed professional judgement should be made as to whether the visual effects can be described as positive or negative (or in some cases neutral) in their consequences for views and visual amenity. This will need to be based on a judgement about whether the changes will affect the quality of the visual experience for those people who will see the changes, given the nature of existing views".*

Judgements on the nature of effect are based on professional experience and reasoned opinion informed by best practice guidelines.

**Table 5.3** is used as a guide for the Nature of Effect. The nature of effect (magnitude of change) affecting landscape or visual receptors depends on the nature, scale, and duration of the change within the landscape, location, the overall effect on a particular view. In landscape terms, the magnitude of change will depend on the loss of, or change in important features, key characteristics, backdrops, or outlook from landscape. The duration of view, contrast with the existing view, angle of view, its openness or degree of obstruction by trees and buildings and the distance of the viewed from the proposed change all influence the nature of effect. General visibility, openness, topography, and degree of obstruction from trees or buildings also impact the nature of effect.

Opinions on the appearance of renewable energy features within the landscape are subjective and the nature of development proposed dictates that it is unlikely to be viewed as a positive/beneficial addition to the landscape or visual amenity.

At best, this form of solar development would likely be viewed as neutral or otherwise adverse to a degree.

**Table 5.3 Nature of Effect (Magnitude of Change)**

| Criteria | Landscape Effects | Visual Effects |
|---|---|---|
| Negligible | The proposal would cause no discernible deterioration or improvement to the landscape or how it is perceived. | No view, or the character of the view is not altered by the development.<br>At such a distance where it is imperceptible or may go unnoticed. |
| Low | Where the proposal would cause a barely perceptible change.<br>Existing built form reduces presence of development proposed. | Visible but is not prominent, with a barely perceptible change.<br>Does not affect overall quality or character of the view. |
| Medium | Where the proposal would cause a noticeable change. Partial loss of or alteration to the key characteristics of the landscape. Out of scale or at odds with the local landform or pattern of landscape. | Appears prominent.<br>Does not define the view but does present a key element. A noticeable change in the quality and character of the view. |
| High | Where the proposal would cause a significant change affecting the character of the landscape or key characteristics.<br>Size of development would be wholly out of scale with existing features. | Dominant visual change.<br>Results in a defining influence on the view. |

## 5.4. ZTV Assessment

Appendix 5.1 illustrates where the proposed solar array will be theoretically visible within a 2km radius of the site. It considers the height of the array and the topography of the landscape, including natural and man-made features such as woodland and buildings present which have the potential to screen views partially, or wholly.

When compared with the bare-earth scenario (Figure 5.1), this illustrates how the wooded setting of the park significantly reduces potential visibility from within the wider landscape.

ZTV modelling shows a limited and sporadic pattern of potential visibility zones within the 2km study area. These are mainly to the north and northwest of the array, falling within predominantly open agricultural land. To the east a potential zone extends to properties at the western boundary of the urban area of Sutton Park (greater Kidderminster), approximately 1km from the boundary of the development site. To the south, pockets of potential visibility are contained within the boundary of the safari park.

The nature of the surrounding landscape and land cover limits the visibility of the array, with a concentration of potential views up to 2km, predominantly to the north and northwest of the development.

As discussed within the methodology section, ZTVs tend to overestimate the extent of the influence of a development on the surrounding landscape. ZTVs are therefore considered a tool to assist in assessment rather than an exact measurement of visual impact.

## 5.5. Landscape Assessment

### 5.5.1. Baseline Landscape Character

National Character Areas (NCAs) divide England into 159 distinct areas, each with a unique 'sense of place'.

Baseline detail, gathered from published documents, confirms that the development site is located within the Mid Severn Sandstone Plateau[19] (NCA Profile 66).

The Mid Severn Sandstone Plateau National Character Area (NCA) is in the central catchment of the Severn and the lower Stour rivers and is a national watershed between the north-easterly flowing River Trent and the south-westerly flowing River Severn. Parklands provide an estate character in places, as exemplified by Weston Park. Special qualities within this landscape are noted as being:

- The plateau is drained by the rivers Worfe and Stour and fast-flowing streams in small wooded, steep-sided streamside dells, locally known as dingles.
- The main river is the fast-flowing Severn, flowing north to south in the west of the NCA, often through steep, wooded gorges, the largest being the Ironbridge Gorge.
- Interlocking blocks of mixed woodland and old orchards provide a well-wooded landscape and conifer plantations combine with parklands to give an estate character. Wyre Forest is part of one of the largest ancient lowland oak woods in England.

[19] NCA Profile: 66 Mid Severn Sandstone Plateau https://nationalcharacterareas.co.uk/Mid-Severn-Sandstone-Plateau/

- Traditional buildings constructed of brick vary in colour. The local Kidderminster and Bromsgrove Sandstone features extensively. Its characteristic red colouration provides local distinctiveness to many towns and villages and estate boundary walls.
- The Stour and Severn valleys contain frequent villages and there are a number of attractive historic towns, for example Bridgnorth and Bewdley with cores of Georgian and earlier buildings; there are fine individual examples of timber-framed buildings in Kinver, Bewdley and Bridgnorth.
- There is a coalfield remnant landscape along the Severn Valley.

In August 2012, Worcestershire County Council produced a Landscape Character Assessment[20] covering the six Worcestershire districts, including Wyre Forest District. This document assesses the landscape and visual character of Worcestershire County providing evidence for the Local development Framework (LDF). West Midland Safari Park is situated to the eastern extent of the Sandstone Estatelands Landscape Character Type (LCT), characterised by its open, rolling landscape with an ordered pattern of large arable fields. As this is recognised as a historic landscape pattern, guidance suggests the preservation and restoration of the distinctive hedgerow pattern, whilst enhancing various woodland features.

The proposed site lies within the boundary of West Midlands Safari Park, located by Bewdley within the southern extent of the Mid Severn Sandstone Plateau NCA, characterised by rolling farmland that gradually subsides into the Severn and Avon Vales NCA. The park was opened under the name of West Midland Safari Park on 17 April 1973.

As per the Worcestershire and Worcester City Heritage Register, the site is located within the Historic Park and Garden of Spring Grove[21]. The safari park contains remnants of the original policy woodlands and structural estate tree planting (arboretum) which characterise estates within the NCA. Much of the original character of the estate has been lost through modern development of the safari park, with new infrastructure and buildings/structures extensively developed within the grounds. The estate is not registered as a national Parks and Gardens designation. It is bounded by the A456 (Kidderminster Road) to the north and west; and by the 45-acre Rhydd Covert Scout & Guide camp site and the Devil's Spittleful Site of Special Scientific Interest (SSSI) to the east.

The Severn Valley Railway line runs past the immediate southern boundary of the park.

Beyond the A456 to the north and west lies the urban areas of Bewdley and Catchems End. Beyond the SSSI to the east lies the urban spread of Kidderminster, namely Blakebrook; Sutton Park; Rifle Range; and Birchen Coppice.

The River Severn, which flows past/through Bewdley, is circa 0.5km from the southwestern corner of the safari park.

### 5.5.2. Landscape Designations, Policy, and Landscape Protections

From desk-based assessment, it is concluded that there are no international, national, or local landscape designations covering the development site. Appendix 5.2 shows the limited distribution of designations within 10km of the array site. These are the Country Parks of Kingsford Forest Park located circa 5.1km NNE and the Severn Valley Country Park located circa 9.1km NNW. Neither will be impacted or effected directly or indirectly by development.

[20] WFDC: https://www.wyreforestdc.gov.uk/media/he3jzosj/wcc-landscape-character-sg-nov-2011.pdf
[21] HER Reference: WSM28617

West Midlands Safari Park is located within Green Belt and covered by Policy DM.22 *Safeguarding the Green Belt*.

This policy states that: *Within the Green Belt (as defined on the Policies Map), development will not be permitted, except in very special circumstances, or unless one of the following applies:*

*e) The proposals involve the limited infilling or redevelopment of an identified Previously Developed Site in the Green Belt, in accordance with the site specific policies contained in Policy SA.PDL.*

- The development presents a small-scale renewable energy scheme to benefit the local safari park/tourist business. By implementing this energy strategy WMSP can actively contribute to national policies relating to green energy and off-setting of carbon footprint, while providing energy security.

Developed areas of the safari park are covered by Policy SA.PDL *Previously Developed Sites in the Green Belt*.

This policy states that: *Within the Previously Developed area of WMSLP limited infilling or redevelopment proposals that support and enhance the park's operations as a leisure and tourism destination will be permitted*.

- The development sees a small-scale renewable energy scheme infilling a small area of the local safari park/tourist business which will assist in covering the park's energy needs in a sustainable way while actively contributing to national policies relating to green energy and climate crisis. By ensuring energy security for the park, the proposed development would support the on-going park operations and help safeguard the leisure and tourism destination in the face of rising energy costs.

There are several Tree Preservation Order (TPO) designations across the property of the safari park which are protected under TPO 2012 (Land at West Midlands Safari Park, Kidderminster). However, the Site does not fall within a local Conservation Area.

- The development proposal has been designed to minimise and/or remove direct impacts to trees as far as is reasonably practicable. The cable trenching follows a predominantly "hard dig" route chosen to minimise/remove the need for invasive trenching in identified Root Protection Areas (RPAs). Construction method statements will ensure best practice on site through construction, lifespan, and decommissioning. Impacts on trees are the subject of a Tree Survey report provided as Appendix 5.5.

### 5.5.3. Baseline Land Use

Within the overall park boundary, the current land-use at the proposed development site is managed (mowed) grassland. The development area has been subject to Phase 1 Ecological Habitat Survey with findings and recommendations relating to impact and Biodiversity Net Gain (BNG) provided in Chapter 7. Ecological recommendations and BNG calculation off-set and enhancement requirements are presented within the associated Landscape Proposal (see Appendix 5.4).

WMSP have a site wide BNG strategy which is not part of this application yet is related in ensuring considered and appropriate biodiversity improvements across the park. This has been prepared by Focus Environmental Consultants. The application BNG strategy does not conflict with this and works as an integral part of the overall masterplan.

This is a non-public area of the park, located approx. 55m to the northwest of the extensive visitor parking area. Sloping downhill from east to west (circa 52m AOD to 35m AOD) this sees a change in elevation of approximately 17m over a 120m distance (14%).

The western (upper) end of the grassy area contains 2no areas of coppiced willow and birch (felled) which have historically been used to produce fodder and bedding for animals within the park.

The eastern (lower) end of the site is adjacent to an existing site office/maintenance shed. External storage of containers and miscellaneous park maintenance materials occurs in this area.

The array site is bounded on the northern, southern, and western sides by existing parkland woodland. There is a self-seeded Quercus robur (Pedunculate Oak) tree within the grassy area close to the northern fringe which is to be relocated by WMSP within the park.

Trees have been surveyed and report prepared by Wharton Natural Infrastructure Consultants Ltd and included as Appendix 5.5.

Figure 5.2 and Figure 5.3 show the context of the array on the sloping site, set within the woodland of the safari park.

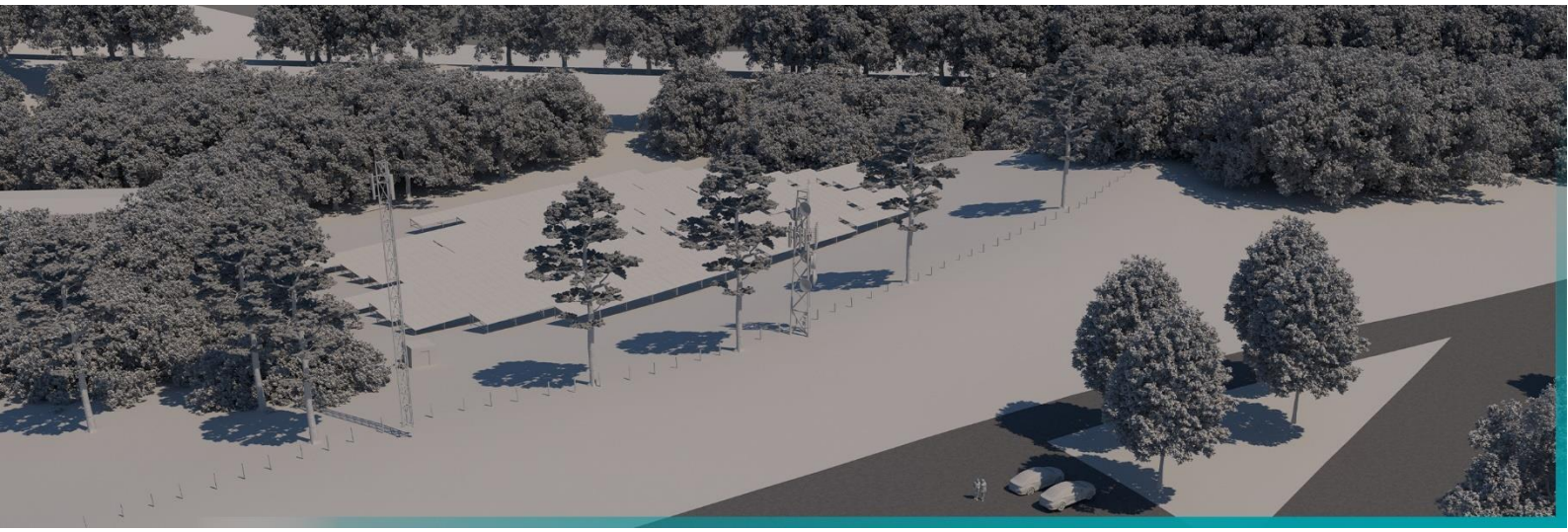


**Figure 5.2 3D Massing of Array Site from the South**

The aerial graphic of the array site from the WMSP car park illustrates the sloping nature of the site and the woodland which encloses it on the west, southwest, northwest and northeast/eastern boundaries.

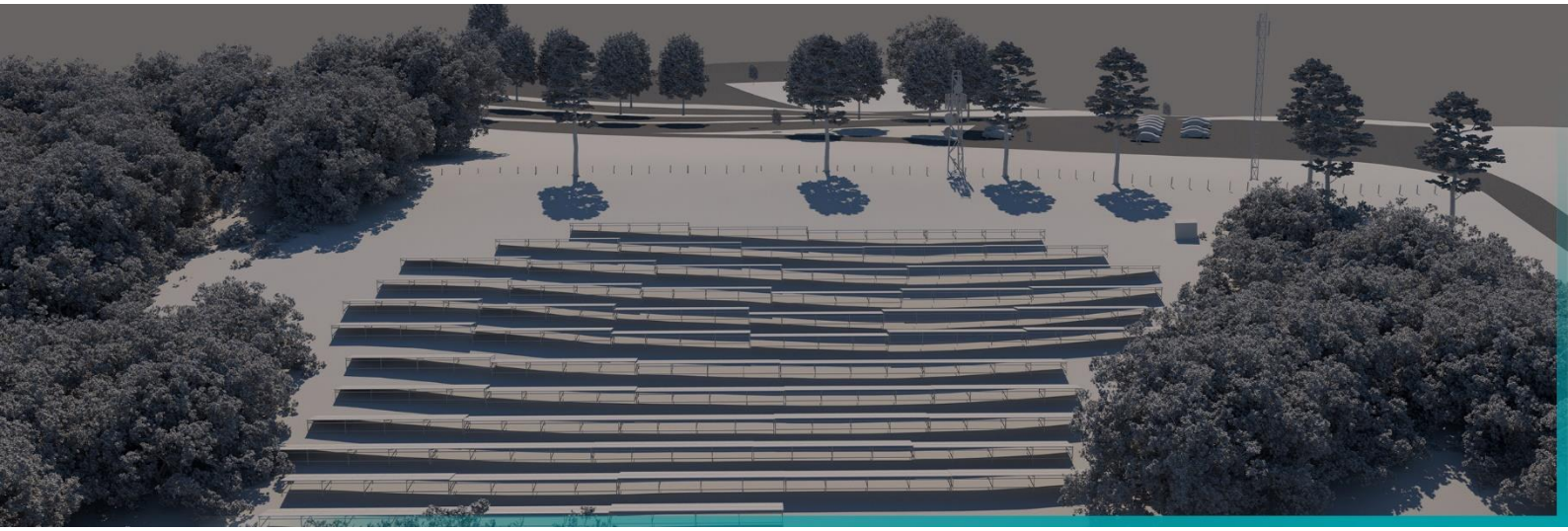


Figure 5.3 3D Massing of Array Site from the Northwest

The aerial graphic of the array site from the northwest shows the array panels angled southeast away from Kidderminster Road and stepped down the slope of the site away from the WMSP car park.

The graphic illustrates the wooded setting of the array site, with the elevated car park to the southeast boundary separated by open space containing line of 4no Scots Pine trees and existing mast infrastructure.

### 5.5.4. Landscape Character Assessment

This section draws on information on the area provided within published documentation and guidance. Table 5.5 also details the overall effect of the proposed solar array on the local landscape.

As identified in the ZTV mapping the array is predominantly visible within the NCA in which it is located therefore assessment and study of impact concentrates on the southern Mid Severn Sandstone Plateau. Given the small scale and low profile of the array proposed at WMSP, combined with the existing landform, land cover, and parkland woodland, potential impacts are considered limited.

Table 5.4 NCA of Development Site

| Receptor | Mid Severn Sandstone Plateau | Nature of Receptor | Medium |
|---|---|---|---|

**Baseline:** Located within the southern extent of the NCA, West Midlands Safari Park is a unique and standalone large-scale tourist development within the Green Belt between Bewdley and Kidderminster.

The Mid Severn Sandstone Plateau is predominantly rural with pockets of urban development reflective of the industrial heritage of mineral extraction (coal and iron ore) and associated heavy industry/infrastructure (river crossings and railway). Within this dynamic and post-industrial landscape parklands provide an estate character in places, with the safari park having been developed within such former parkland estate of Spring Grove House.

The safari park itself contains a range of managed landscapes to mimic appropriate habitats for the range of animals it supports. This includes plains/grasslands and varied woodlands, many of which are the policy woodlands and arboretum of the original estate (not classified within national Parks and Gardens register).

The woodlands and single trees of the park are covered by Tree Preservation Order (TPO). Alongside the original elements of the country estate such as the Grade II listed house/stable block and landscaped lake (boating pond), the property also contains amusement park with amusement ride infrastructure; buildings (animal housing/visitor attractions, tourist lodges/accommodation, various office/maintenance/storage); access infrastructure (public and maintenance tracks & paths); and extensive visitor & employee parking. This is an important tourist/economic site within the wider area.

While the park is located with the Green Belt between Bewdley and Catchems End, this is a dynamic and heavily managed/maintained landscape and building/recreational infrastructure complex. Existing pressures on the Green Belt and NCA within this area, external to the distinct boundary of the safari park development, include the urban expansion of Bewdley and the greater Kidderminster area of conurbation.

| Receptor | Mid Severn Sandstone Plateau | Nature of Receptor | Medium |
|---|---|---|---|
| **Analysis:** The site is located wholly within this NCA, situated within Green Belt, however fully within the property boundary of the safari park which is an existing recreational/tourist development. The proposal would see a small-scale solar array incorporated into the existing framework of policy/parkland woodland and man-made elements found within the safari park property. Development would see the retention of existing trees at the array site which would provide significant immediate screening negating the need for extensive mitigation/screen planting.<br>1no Quercus robur (Pedunculate Oak) tree within the array footprint is to be relocated by WMSP prior to the construction process and replanted in an area of the safari park to be determined. Trees within the park are under TPO and all tree works, inclusive of small sections of no-dig trenching, will be conducted under professional arboricultural supervision. Direct impacts to tree groups are identified within the Arboricultural Impact Assessment prepared by Wharton Natural Infrastructure Consultants Ltd and are to be kept to a minimum through approved method statements for all trenching works. The character and densities of woodland groups will not be altered.<br>The Green Belt designation through Policy would result in a high sensitivity to intrusive (permanent) built form development, however the baseline landscape of the developed safari park setting (and nature of development) sees this realistically reduced to medium. Given the location of the array within the wider safari park, the resultant effect on the Green Belt designation is low and can be considered as negligible on the wider pattern and structure (character) of the NCA.<br>Although the solar array and associated GRP unit and kiosk will introduce new modern elements into a (formerly) historic parkland landscape, as a renewable technology associated with the immediate modern safari park infrastructure, impacts to the baseline landscape are considered minimal.<br>Topography and extensive woodland surrounding the site provides a backdrop and enclosure to development where impacts are contained to the boundary of the site and largely viewed from insignificant receptors (agricultural land) beyond this boundary.<br>Installation of the solar array will not alter the traditional landscape features of the NCA, operating solely for the generation of renewable energy for use within a popular tourist site.<br>Existing landscaping will remain, with little loss of key features.<br>The development footprint is relatively small, with minimal groundworks required to accommodate the array at the site.<br>The lifetime of the development is to be no more than 35 years, after which the site will be fully restored to its previous state, ensuring that development is temporary in nature, and fully reversible.<br>It is concluded that the array would be adopted at its proposed location with minor impact to the key characteristics and features of the baseline Green Belt and NCA. | | | |
| Nature of Effect | Low | | |

### 5.5.5. Residual Effects of Construction

Tree-fixtures are proposed to hold the array frames, thus preventing the need for more intrusive foundation creation, and to protect adjacent tree roots. The existing maintenance shed/office access roadway is to be used, with existing small car park and additional area adjacent to the shed used for staging/material & plant storage during works. Staging areas will be returned to grass and car park respectively upon completion of the installation.

During construction, appropriate setback is to be provided from existing tree lines per BS5837:2012 Trees in Relation to Design Demolition and Construction.

Trees within the safari park are covered by blanket Tree Preservation Order (TPO). The cable route has been located to minimise tree root impacts as far as is reasonably practicable given position of array and existing plant room. It is fully acknowledged that the route will pass through identified Root Protect Areas (RPAs) and every endeavour has been made to keep these runs as short as possible. All trenching within these short runs and identified on plan (see Appendices 2.3 and 2.4), is to be conducted in a "hand-dig" manner with use of air lance where appropriate to prevent damage to root

massing. Recommendations for sensitive hand digging and use of air lance, along with works to be conducted under the observation/supervision of an Arboricultural Clerk of Works (ACoW), are included in the Tree Survey report prepared by Wharton Natural Infrastructure Consultants Ltd. It is recommended and expected that appropriate method statements and ACoW be conditioned as part of Planning Approval.

The cable route has been selected to pass through existing carpark and path/road areas to avoid soft (landscape) zones and Root Protection Areas (RPAs) as far as is reasonably practicable. Any/all earth-working or construction machinery would be tracked vehicles to prevent/minimise compaction of soils within the development area per BS 3882:2015 Specification for Topsoil.

During the period following construction any areas affected will be graded, cultivated, and reseeded to ensure vegetation recolonises. The overall residual effect will be minimal.

Following decommissioning, the site will be returned to its pre-developed state with no evidence of development having taken place. The long-term (residual) effects are therefore classed as temporary and are anticipated to be fully reversible.

**Table 5.5 Summary of Effects of Development on NCA and Landscape Designations**

| Receptor | Sensitivity of Receptor | Nature of Effect |
|---|---|---|
| Mid Severn Sandstone Plateau NCA | Medium | Low |
| Green Belt | High | Medium |
| Tree Preservation Order (TPO) | High | Medium |

### 5.5.6. Visual Assessment

As described in the methodology, the visual study comprises assessments of the ZTVs of the proposed solar array which have been created to illustrate the potential footprint of visibility and those areas where views of sensitive assets could theoretically be impacted by the addition of the array. Due to the constrained extents of the ZTV mapping, receptors of identified importance/significance are limited to four (4).

The following sections assess the potential impact of the development from the identified areas.

### 5.5.7. Assessment of ZTVs and Photographic Study

ZTVs have been produced to illustrate the context of the proposed development with topography and in association with recognised heritage assets from several locations identified through this ZTV analysis within the study area. This modelling is to demonstrate scale of development in relation to topographic form and these assets in potential combined views.

Table 5.6 Viewpoint Selection Criteria

| Viewpoint Selection Criteria |
|---|
| Being publicly accessible; |
| Having a reasonably high potential number of viewers or being of particular significance to the viewer(s) affected; |
| Providing a representative range of viewing distances (i.e. short, medium and long-distance views) and elevations; |
| Representing a range of viewing experiences (i.e. static views, for example from settlement, designated viewpoints or car parks and points along sequential views, for example from public highways and walking and cycling routes); |
| Ensuring that the assessment includes areas with features such as pylons, or other 'intrusive' features to enable assessment of possible impacts of the proposal in the context of such features; |
| Representing a range of views (i.e. panoramas, vistas, glimpses); |
| Representing views with difference extents of the development visible (the full array, or partial array). |

Through assessment of overall development ZTV (Appendix 5.1) and the individual ZTVs produced to highlight potential co-visibility of development with several identified heritage assets (Appendices 6.2 to 6.5), areas/viewpoints have been chosen which reflect varied receptor type and accord with some (or all) of the criteria within Table 5.6

Viewpoints outside the ZTVs and/or the study area have been excluded from this appraisal on the grounds that the array will not be visible or will be at a distance whereby significant impacts are unlikely.

When accounting for screening within the landscape, potential vantage points are limited for this study. Those viewpoints/areas considered are illustrated on Appendix 5.3, showing their location within the study area and orientation. Table 5.7 to

Table 5.10 set out the baseline visual receptors and assess the potential visual effects of the proposal on each of the viewpoints/areas selected.

Table 5.7 Viewpoint 1 – Rear of Residences (Highgate Close), Sutton Farm

| | | | |
|---|---|---|---|
| Grid Reference | E: 381186 N: 275815 | Type of Receptor | Residential (Secondary Views) |
| Direction of View / Distance to Development | West / 750m | Sensitivity of Receptor | Medium |

**Baseline View:** The area is representative of potential views from the upper rear windows (secondary views) of residences on Highgate Close, Sutton Farm, situated approximately 750m east of the proposed array. Due to the inability to access this zone due to private land (pastoral grazing) to the rear of the properties, and the private nature of the receptor (residential amenity), no baseline photography has been possible.

Rear gardens of these residences are screened by mature privacy hedging and fencing, while intervening field boundaries of mature hedgerow and single trees/tree groupings fully screen development from enclosed garden (ground floor) views.

The crest of ridge to the east of the array (the highest elevation of the development site at circa 52m AOD) would potentially be seen. The array site slopes downhill away from view (westwards) to the lowest elevation, approx. 35m AOD, beyond the direct line/angle of sight.

The gentle undulating form of the wider valley containing predominantly small to medium-scale agricultural fields and pockets of woodland and field boundary vegetation extends towards the west, rising to the more forest-blanketed hills of the Wyre Forest National Park (approximately 5km west, and straddling the borders of Worcestershire and Shropshire), to the Shropshire Hills NCA further west.

**Predicted View:** The top of the upper (eastern) line of array panels would potentially be seen in these rear property views, extending slightly above the crest of ridge beyond the car park.

Realistically with the line of sporadic trees (Scots Pine) and scrub vegetation located along this ridge, any such view would be broken and screened. Further intervening field margins of mature hedgerow would also provide significant screening.

Through orientation and proposal positioning, the solar array is well-sited within the theoretical view, on the face of slope away from the receptor. Given the extent of the development that would potentially be visible above crest of hill, it is deemed that development would be of a suitable scale/height where it does not present a visual or prominent feature within the local landscape, being screened by intervening vegetation.

Any possible visibility of the extreme top of array would not dominate or define the view, instead it would be absorbed into its landscaped setting.

Located within the safari park site, the solar array does not negatively alter the visual amenity of the residential receptor.

| | |
|---|---|
| Nature of Effect | Negligible |

Table 5.8 Viewpoint 2 – Hoarstone Farm (Hoarstone Lane)

| | | | |
|---|---|---|---|
| Grid Reference | E: 379424 N: 276833 | Type of Receptor | Residential, Historic Asset |
| Direction of View / Distance to Development | Southeast / 1.3km | Sensitivity of Receptor | High |

**Baseline View:** This area represents potential views from several residential receptors and the historic (Grade II listed) Hoarstone Farm. The viewpoint, located on Hoarstone Lane by the complex of buildings, is 1.3km from development. Views southwest through southeast are across small to medium-scale agricultural fields.

This is a complex and busy mosaic landscape encompassing the mature field boundaries of mixed hedgerow and field margin trees; pockets of woodland around other agricultural farm complexes; the urban expanse of Catchems End; the wooded property and building complex of the expansive Heath Hotel; the tree-lined corridor of the A456 (Bewdley By-pass); and the policy woodland of West Midlands Safari Park beyond this.

**Predicted View:** When considering the bare earth/topographic modelling from the higher elevation of this viewing area (approx. 65m AOD), the eastern (upper) portion of the array would potentially be visible on the west facing slope of the site, with the western extent screened below the crest of intervening topography.

Realistically with the extensive policy/parkland woodland found to the western end of the array, and tree cover along the boundary of the safari park and A456 roadway corridor (see photo), any such direct views would be screened with only the slightest view of the upper edge of the eastern-most panel line of the array seen through the tree line, if at all. The existing open space area is not evident in existing views, and any potential array sighting (negligible) is realistically lost within the woodland.

Situated on the west facing slope, the solar array is suitably sited and is of an appropriate scale where it does not present a visual or prominent feature within the local or wider landscape and again is absorbed into its wooded setting. Located within the wooded safari park site, the solar array does not greatly impact the landscape setting, nor does it alter the visual amenity of the receptors given distance and intervening and surrounding (wooded) land cover.

| | |
|---|---|
| Nature of Effect | Negligible |

**Table 5.9 Viewpoint 3 – WMSP (car park) with Views Towards Wassell Wood House**

| | | | |
|---|---|---|---|
| **Grid Reference** | E: 380483, N: 275797 | **Type of Receptor** | Tourist, Leisure |
| **Direction of View / Distance to Development** | Northwest / 1.75km | **Sensitivity of Receptor** | Medium |

**Baseline View:** This area is indicative of views from within the safari park, selected from ZTV mapping which illustrates potential co-visibility of both the array and the heritage asset (Grade II listed Wassell Wood House) from the car park. The setting of the house is backdropped by the 170m AOD hill, noted for its Scheduled Monument of earthwork with buried remains (moated site)[22] and blanketed by semi-mature ancient woodland.

Views from within the parkland environment of the safari park would be heavily filtered/screened given the density and height of scrub planting and mature trees found in the immediate location.

**Predicted View:** The ZTV modelling indicates that from this location the house would be visible, viewed over the upper (eastern) row of the solar array which would potentially be seen slightly above the crest of ridge from the car park area. Realistically the smaller scale scrub landscape material along this crest of ridge (which would not show up in ZTV exclusion modelling) would screen the top of the array from receptors in this location. Any glimpses of Wassell Wood House would be seen through the mature tree planting located at the western extent of the array site, and along the A456 road corridor (see photo from within upper array site).

The solar array would not be prominent in the car park view, being sited on the face of slope away from the receptor. It is of a suitable height and elevation where it would not present a visual or dominant feature above the ridge within the local park landscape. Any visibility of the extreme top of array (in conjunction with views of Wassell Wood House) would not dominate or define the view, resulting in low nature of effect on views incorporating the existing historic asset/house.

| | |
|---|---|
| **Nature of Effect** | Low |

[22] Historic England, https://historicengland.org.uk/listing/the-list/list-entry/1014743?section=official-list-entry

Table 5.10 Viewpoint 4 – Wassell Wood House

| | | | |
|---|---|---|---|
| Grid Reference | E: 379486 N: 277244 | Type of Receptor | Residential, Historic |
| Direction of View / Distance to Development | Southeast / 1.6km | Sensitivity of Receptor | High |

**Baseline View:** This area description is representative of those character views from residential receptors and the historic asset (Grade II listed) Wassell Wood House. Baseline view is representing a vantage point at the front of the house and is 1.6km from development. Due to the private residential nature of the grounds and surrounding land, no baseline photography has been possible.

The setting of the Grade II listed house is very prominent within the landscape, set nestled within Wassell Woods on the southern face of the hill, which affords views southwest through southeast across the busy mosaic landscape encompassing the mature field boundaries of mixed hedgerow and field margin trees (small to medium-scale agricultural field pattern); pockets of woodland around houses and agricultural building/steading complexes; the urban expanse of Catchems End; the wooded property and building complex of the Heath Hotel; the tree-lined corridor of the A456 (Bewdley By-pass); and the policy woodland and park infrastructure of West Midlands Safari Park beyond this.

The gently undulating form of the wider valley landscape of the LCT would be apparent with a relatively simple skyline in the far distance.

**Predicted View:** Per ZTV mapping, the Zone of Theoretical Visibility shows that potentially the easternmost extent of the array could be viewed through the woodland belt found to the western (lower elevation) boundary of the development site. The extensive tree cover around the site, and located along the A456, would predominantly screen/filter potential views of the array, while intervening pockets of small-scale woodland and the expansive grouping of trees within the grounds of the Heath Hotel would also buffer/screen direct views.

While bare-earth ZTV modelling indicates direct views given the western face of slope towards this viewing area, realistically the impact would be significantly lessened given the intervening landcover and built form which is also seen in these south-easterly views.

The small-scale array is sited on the slope to maximise sun exposure, with the extents of the development clearly defined by the surrounding park woodland setting. The array is not sky-lined, located within a gentle undulation which characterises the topography of the wider valley. The scale of the array, constrained by its setting, is not incongruous to other built form within the immediate and wider landscape, and is absorbed into the wider landscape within the wooded parkland setting.

The solar array does not greatly impact the landscape setting, nor does it alter the visual amenity of the receptor given its scale, distance, and intervening land cover, along with the visual connectivity with other park infrastructure.

| | |
|---|---|
| Nature of Effect | Negligible |

## 5.6. Roadway Assessment

Following feedback from WFDC and per discussions at on-site meeting with WMSP and WFDC on the 20th of October 2022 regarding potential impacts from roadway receptors on the Kidderminster Road to the north of the array site, the following targeted study with recommendations has been conducted to present impacts/resultant effect and enhancement/screening.


**Figure 5.4 Kidderminster Rd Boundary Views**

Figure 5.4 illustrates the location of the thinnest boundary woodland area where, through proximity to the array site views of the array may be achieved by receptors on Kidderminster Rd. Most sustained views would be from pedestrian users/cyclists, while vehicular users (driving direction at an oblique angle to the array site) would experience a more fleeting/indirect view.

**Figure 5.5 Kidderminster Rd - Photo 1**

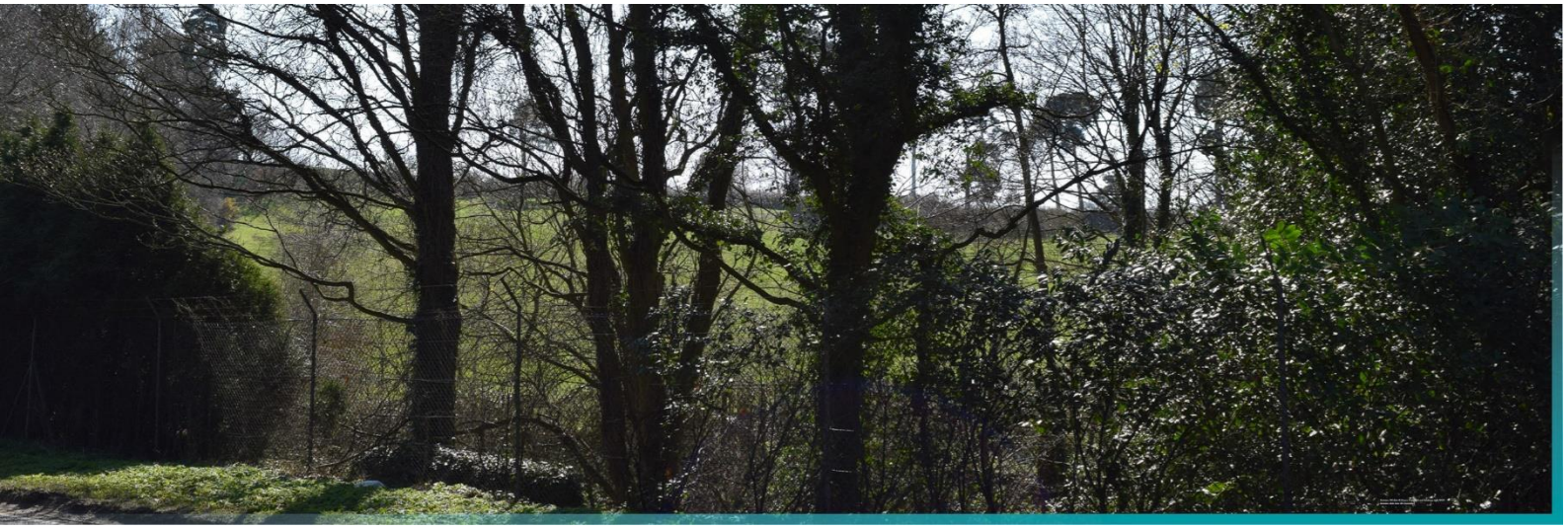


Figure 5.6 Kidderminster Rd - Photo 2

Figure 5.7 Kidderminster Rd - Photo 3

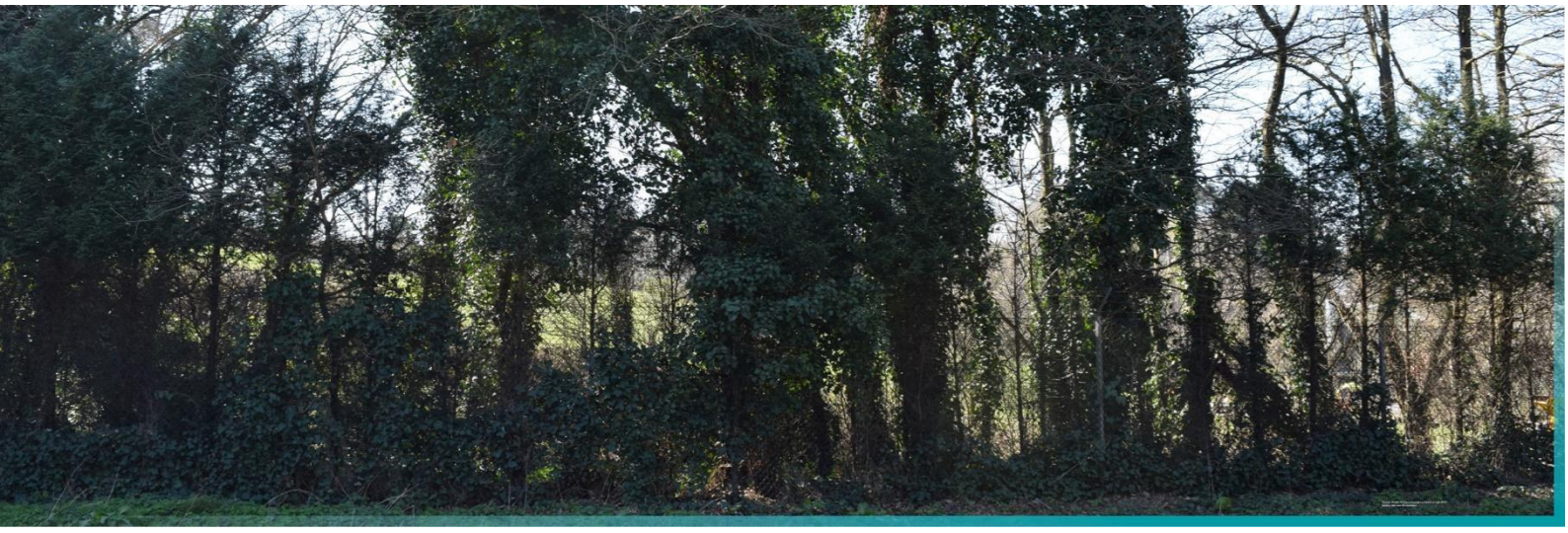


Figure 5.8 Kidderminster Rd - Photo 4

As shown from photography from Kidderminster Rd (Figure 5.5 to Figure 5.) the semi-opaque degree of existing landscape screening allows for filtered views into the array site, with slope of hill partially glimpsed through the thinner woodland and sparse evergreen hedging.

Additional screening on the southern (WMSP property) side of the boundary fencing will assist in further reducing direct views of the array structures, significantly reducing impacts to receptors on this roadway corridor.

The Landscape Proposal (Appendix 5.4) prepared for the application provides the location, species, size, and spacing of landscape material installed to mitigate for that lost per Biodiversity Net Gain (BNG) requirements, while providing enhancement to perimeter green buffering, actively reducing negative visual impacts from Kidderminster Road to low.

## 5.7. Residual Impacts - Conclusion

Given the scale of the array development and its location within the existing safari park (bordered by mature tree groupings), it is easily absorbed into its setting and affords a renewable energy development which has been sited and carefully considered to minimise direct physical landscape impacts and limited negative visual effects.

Through assessment of the wider WMSP property and the spaces/buildings within, opportunities for roof-mounted and ground-mounted arrays are limited. Within the context of the park and its association with the wider Greenbelt allocation, the site offers the best opportunity to provide on-site energy in a fashion that minimises direct physical and wider visual adverse impacts as far as is reasonably practicable.

Using the existing infrastructure of the park no access tracks require construction. There are no site levelling works proposed to accommodate the development, which greatly reduces the potential impact to the baseline landscape. Suitable setback of the development boundary has been provided to minimise/remove impacts on neighbouring tree Root Protection Areas (RPAs), while the cable has been routed to minimise further. Tree-system fixtures to hold the array mounting frames will further minimise ground and root impacts.

It is recommended, and anticipated, that robust working method statements guide best-practice hand-dig measures within tree areas to ensure that correct procedures are followed to minimise negative impacts to tree roots. It is expected that all works would be conditioned to be carried out under the watch and advisement of a certificated professional Arboricultural Clerk of Works (ACoW).

Views into the site are restricted given the wooded nature of the park. Visual impacts on higher sensitivity receptors within the wider landscape are considered not significant. Through appropriate mitigation planting, impacts to receptors on Kidderminnster Rd can be considered reduced to low.

During the period following construction, the site will be returned to its current cover with grassland resulting in an overall minimal effect to the area. All cable removal works will again accord to best practice to prevent tree root damage, and excavation works to any open space/landscape will be made good.

The predicted lifespan of the array is 35 years. As such, the impact of the development is likely to be medium-term (temporary). Upon completion of the array's working life, the development will be decommissioned, and the site returned to its previous use. Consequently, this development will be fully reversible, with any predicted long-term (permanent) impacts being reduced to neutral.

# 6. HERITAGE IMPACT ASSESSMENT

## 6.1. Introduction

The historic environment is defined as "*all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora*". The importance of protecting this historic environment is widely recognised; however, this protection is not to prevent change but is instead to enable the positive management of any change. This is informed by understanding the importance of the heritage assets likely to be affected. As stated in the Historic England document Our Climate Change Strategy, "*climate change is one of the most challenging issues of our time, with potential negative consequences for both people and heritage*". Renewable energy is one the cheapest and most efficient ways developed to address climate change issues.

While renewable energy developments can threaten the historic environment if sited inappropriately, they can also work towards protecting and ensuring long-term continued use of heritage assets. Consequently, the impact of renewable energy developments must be assessed thoroughly and any impact that is caused must be ensured to have a positive or, at worst, neutral effect.

The aim of this chapter is to appraise the existing heritage assets within the local area and establish their significance, as well as consider the potential impact posed by the proposed siting and design of the development on designated historic buildings, areas and archaeological remains within the study area. Measures to mitigate and/or offset the impact of the proposed development will be identified where appropriate, alongside an assessment of any residual or cumulative effects.

## 6.2. Legislation, Policy and Guidance

Legislation, planning policy and best practice guidance aims to protect, conserve and enhance the historic environment. Where the character of the heritage asset or their setting will be preserved or enhanced, the Council and relevant Bodies support the development of renewable energy. Table 6.1 below lists those specifically of relevance to the historic environment, while Table 6.2 details best practice guidelines. Legislation and policy relevant to this proposal, as a whole, is covered in Chapter 3 of this report.

**Table 6.1 Policy and Legislation Relevant to the Historic Environment**

| Document |
|---|
| Planning (Listed Buildings and Conservation Areas) Act 1990[23] |
| National Planning Policy Framework (NPPF) (revised 2021): Chapter 16: Conserving and Enhancing the Historic Environment (paragraphs 189 – 208)[24] |
| Wyre Forest District Local Plan (2016-2036) - Adopted April 2022 – Chapter 25: Safeguarding the Historic Environment[25] |

**Table 6.2 Historic Environment Best Practice Guidelines**

| Document |
|---|
| Historic England: Good Practice Advice Note 1: The Historic Environment in Local Plans (2015) |
| Historic England: Good Practice Advice Note 2: Managing Significance in Decision-Taking in the Historic Environment (2015) |
| Historic England: Good Practice Advice Note 3: The Setting of Heritage Assets (2017) |
| Historic England: Statements of Heritage Significance: Analysing Significance of Heritage Assets, Historic England Advice Note 12 (2019) |
| Historic England: Conservation Principles, Policies and Guidance (2008) |
| Historic England: Energy Efficiency and Historic Buildings (2018) |
| Principles of Cultural Heritage Impact Assessment in the UK (IEMA, IHBC, CIfA) (2021) |
| Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists) (2014; updated 2017, 2020) |
| Technical Guidance Note 06/19, '*Visual Representation of Development Proposals*' (Landscape Institute) (2019) |

## 6.3. Consultee Feedback

Initial reporting presented to WFDC and the relevant historic consultees within the Screening Request highlighted the historic designations within the wider landscape in relation to the development site at WMSP. Feedback was provided by the Conservation Officer for Wyre Forest District Council (WFDC CO) and Worcestershire County Councils Archive and Archaeology Service (WCC AAS). The points of feedback are noted in the following section:

WFDC CO – "*...the proposal may have the greatest impact on the setting of heritage assets, either because it will be directly visible from them or because there may be co-visibility between the development and heritage assets in more wide-ranging views encompassing both the development and heritage assets...whilst the applicant makes a good case for not assessing the impact of the development on every individual listed building in Bewdley and Kidderminster... there are nevertheless some isolated and prominent designated heritage assets (listed buildings) which this development may impact upon in terms of their wider setting and views towards these listed buildings from elevated viewpoints.*

[23] Planning (LB and CA) Act 1990: https://www.legislation.gov.uk/ukpga/1990/9/contents
[24] NPPF: https://www.gov.uk/government/publications/national-planning-policy-framework--2
[25] Wyre Forest District Council – LDP: https://wyreforestdc-consult.objective.co.uk/kse/event/36887/section/5855474

*Specifically, within a 2km radius these include: Church of St Anne Bewdley Grade II* (NHLE 1099966), Winterdyne Bewdley Grade II* (NHLE 1348266), Hoarstone Farmhouse Grade II* (NHLE 1167685,) Wassell Wood House Grade II (NHLE 1167709).*

*…Whilst there may not be direct inter-visibility between these heritage assets and the proposed development, there exists the possibility of co-visibility of the development in views towards them from these vantage points and thus there is a need for these to be thoroughly researched and a Landscape and Visual Impact Assessment undertaken: first to establish the degree of co-visibility and second the sensitivity of that view to the setting of the heritage asset."*

WCC AAS – *" The site does not lie within a sensitive area as defined by the Act and would not require EIA on historic environment grounds. Should the development constitute EIA on other grounds, the Environmental Statement should include a chapter on cultural heritage. Should the development not be considered EIA, then the application should be accompanied by a heritage statement that considers the impact of the development on the historic environment. The site does lie within the former parkland of Spring Grove House and within the setting of a number of designated buildings/structures. This site was archaeologically evaluated in 2014 as part of an application for a hotel, conference centre, spa and water park. No features of archaeological significance were encountered. Therefore the scope of any assessment can focus on the above ground impacts and any potential mitigation required."*

These noted comments, alongside the feedback received during the Pre-Application Consultation (as detailed previously in Section 3.6 of this report), have been considered and appropriate assessment undertaken to analyse potential impact. The results of this assessment, both desk-based and field-based are presented in this chapter.

## 6.4. Methodology

A desk-based study allows identification of heritage assets within the historic environment surrounding the site which could potentially be affected by the development. Baseline conditions are then provided based on available information on the assets noted, and if necessary, a site visit. Whilst mapping is an important starting point, an appreciation of built and natural form within the surrounding landscape is best gained during a site visit. Potential indirect impact is initially based on the theoretical visibility of the development proposed. A Zone of Theoretical Visibility (ZTV) generated highlights the areas within the landscape where the proposed development is theoretically visible. It should be noted that ZTV maps do not consider orientation of viewers and may indicate a theoretical view that is outside of the actual angle of view afforded. Calculations also do not allow for the deterioration of visibility over distance, light or weather. As such, ZTVs tend to overestimate the extent of the influence of a development on the surrounding landscape and visibility.

In some instances, where deemed appropriate and worthwhile, additional visualisation methods are adopted, including Photomontages. Utilising the same terrain data as the ZTV produced, the same limitations are experienced in terms of local topographical features which are not accounted for within the contours provided. Photography is taken following the Technical Guidance Note 06/19, '*Visual Representation of Development Proposals*' from the Landscape Institute, with photomontages compiled in accordance with adopted guidance.

### 6.4.1. Assessment of Significance

The first stage of this assessment involves establishing the significance and importance of any heritage assets likely to be impacted by the proposed development, and assessing the sensitivity of those assets to any change. All heritage assets have significance, however, some are judged to be more important than others. This judgement is made through understanding the history, fabric and character of the heritage asset, including *" its origins, how and why it has changed*

*over time..., the form and condition of its constituent elements and materials, the technology of its construction, any habitats it provides, and comparison with similar places*"[26]. The importance of the majority of heritage assets has already been set out through their designation, whether that be through Listing, Scheduling, etc. Heritage assets therefore are rated based on their designation. The importance of non-designated assets will be assessed based on professional judgement with the aid of criteria as shown in Table 6.3, which details the sensitivity hierarchy of the historic assets.

[26] Historic England: Conservation Principles, Policies and Guidance (2008)

Table 6.3 Historic Environment Receptors Scale of Sensitivity

| Sensitivity | Designation |
|---|---|
| High | World Heritage Sites<br>Assets valued at an international or national level, including;<br>Scheduled Monuments<br>Grade I Listed Buildings<br>Registered Parks and Gardens<br>Inventoried Battlefields<br>Other buildings or structures of recognised international importance. |
| Medium | Undesignated structures of national importance<br>Grade II* and Grade II Listed Buildings<br>Conservation Areas |
| Low | Historic monuments/buildings of local significance/locally listed assets |
| Negligible | Archaeological sites whose importance cannot be determined with the information currently at hand. This can include sites where the extent of buried remains is unknown. |

An assessment of the potential magnitude of impact posed by the development on each heritage asset follows. The magnitude of impact varies and is affected by various factors, including distance and degree of visual effect. Impacts can be assessed to fall within four types of impact, as detailed in Table 6.4, and Table 6.5 discusses the magnitude of impact considered within assessment.

Table 6.4 Types of Impact to Assets

| Type | Impact |
|---|---|
| Direct Physical Impact | Physical fabric of the asset is removed or damaged as a direct result of the development, e.g. removal of archaeological deposits as a result of excavation for foundations.<br>Such impacts are generally a result of the construction phase and will be permanent. |
| Indirect Physical Impact | Fabric is lost or preserved as a result of the development even though the asset lies removed from the proposal, e.g. damage to walls as a result of vibration from piling.<br>Such impacts occur at any stage of development and likely to be permanent. |
| Setting Impact | Generally direct impacts from the proposal causing change within the setting of the heritage asset, affecting its cultural significance or the way it is understood, appreciated and experienced.<br>Generally, but not exclusively, visual.<br>Could change with seasonal variations.<br>Such impacts occur at any stage of development and may be permanent, reversible or temporary. |
| Cumulative Impact | Relate to the physical fabric or setting of assets. Result of impact interactions, either of different impacts of the proposal itself or between the impacts of other projects. |

Table 6.5 Historic Environmental Magnitude of Impact

| | Guideline Criteria | |
|---|---|---|
| Magnitude | Adverse | Beneficial |
| High | Severe alteration of the setting of a heritage asset or a fundamental changing in setting of a building<br>Complete destruction or removal of a designated site or structure | Preservation of an asset in situ where it would be completely or almost completely lost in the do-nothing scenario. |
| Medium | Partial alteration of the setting of an archaeological monument or building<br>Removal or physical alteration to part of a monument or extensive alteration of a building | Changes to key elements of the asset's fabric or setting that result in its cultural significance being preserved, where they would otherwise be lost, or restored. |
| Low | Minor or barely perceptible change to the setting of an archaeological monument or building<br>Removal of a small part of a larger monument or site or a change to a building's feature that causes a minor alteration to the historic context or setting | Changes that result in elements of the asset's fabric or setting that detract from its cultural significance being removed. |
| Negligible | No perceptible change in setting<br>No/fully reversible physical impact | |

Guidance notes that the magnitude of impact of a development can range from beneficial/positive to adverse/negative. Due to the nature of renewable energy developments and their interaction with the Historic Environment, there is an assumption that all effects will be neutral at best, otherwise there will be an adverse impact.

When the sensitivity of a monument is assessed against the magnitude of impact, the significance of effect is derived from the matrix in Table 6.6. It should be noted that the intention of the matrix is to act as a guide and professional judgement has been applied during the assessment of effect. This is not all-encompassing, neither can it be used to provide an objective result; however, it remains a useful tool in order to easily take into account a number of important factors.

Table 6.6 Significance of Effect Matrix

| Magnitude of Impact | High | Medium | Low | Negligible |
|---|---|---|---|---|
| Sensitivity of site | | | | |
| High | Severe | Severe/Moderate | Moderate/Minor | Minor/Neutral |
| Medium | Moderate | Moderate/Minor | Minor | Neutral |
| Low | Minor | Minor/Neutral | Neutral | Neutral |
| Negligible | Neutral/Minor | Neutral | Neutral | Neutral |

In terms of the EIA Regulations, those effects considered Major or Major/Moderate, (Severe, Severe/Moderate in this instance) will be described as *significant*. These are the effects that the assessor considers to be material in the decision-making process. It should be noted that significant effects need not necessarily be unacceptable or negative, and in terms of the proposed development, are reversible.

Should mitigation measures be necessary, these are discussed where applicable, ensuring minimal impact is posed to sensitive heritage assets within the landscape. Recognition of any residual effects are also discussed.

### 6.4.2. Impact on Setting

The guidance provided by Historic England in Good Practice Advice in Planning: Note 3 (GPA3): The Setting of Heritage Assets (2017) makes clear that "*analysis of setting is different from landscape assessment. While landscapes include everything within them, the entirety of very extensive settings may not contribute equally to the significance of a heritage asset, if at all*" (paragraph 14).

In considering whether to grant planning permission for development which affects a heritage asset or its setting, there is an "*obligation on decision makers to have special regard to the desirability of preserving Listed Buildings and their settings*". The NPPF establishes that setting can be viewed in two ways: it can add to the importance of a heritage asset, and it can allow an appreciation of that significance. The approach towards taking decisions on setting, illustrated in Historic England in Good Practice Advice in Planning: Note 3 (GPA3): The Setting of Heritage Assets (paragraph 5) "*can also be used to assess the contribution of a view, or views, to the significance of heritage assets and the ability to appreciate that significance*". Therefore, impact can be had on a heritage asset or on its setting if the surroundings are changed in a way that alters the perception of understanding, appreciation or experience.

Within this chapter, only those effects of the proposed development considered as significant will likely have the potential to adversely affect the heritage asset or their setting. It will be considered that there is no negative impact on the character or appearance of the heritage asset where no significant effect is found. This is due to setting not always making a significant contribution to a heritage asset and therefore, in these cases, changes within the wider environment would be unlikely to affect the integrity of the asset or its significance.

In situations where significant effects are found, an assessment of the impact on the setting of a heritage asset will be made. While an impact may be classed as significant, this does not however mean that an adverse effect to the setting of the heritage asset will harm its integrity. The assessment of impact will depend on whether the potential effect would result in an impairment to the understanding, appreciation or understanding of the heritage asset within its surroundings, and therefore if its significance would be reduced. In order to do this, professional judgement is used throughout with the aid of the criteria previously detailed in Table 6.3.

## 6.5. Study Area

An assessment of the historic environment encompassing the development site at WMSP has been conducted to determine the potential impacts of the proposed PV array installation and associated works sought. This desk-based assessment will determine, as far as is reasonably possible from existing records, the nature, extent and significance of the historic environment within a specified area. The aim is to identify the direct and indirect impacts of the array, including anchors/frames, cable trench and other infrastructural requirements around the development, within a defined study area around the development, concentrating on those assets at risk of impact. The impact assessment will determine whether to mitigate, offset or accept without further intervention that impact posed by the development. The study area has been determined using professional judgement upon reviewing the site and surrounding landscape. As agreed with the Statutory Consultees during screening, assessment of buried artefacts is omitted from study, along with those Listed Buildings within Bewdley and Kidderminster. Assessment considers the Listed Buildings requested by WFDC Conservation

Officer, along with those within 1km of the development site, and other historic designations of highest sensitivity[27] within 2km. Given the nature and layout of development proposed, combined with the topography and built-up nature of this region, impacts beyond the study area are deemed unlikely and of negligible effect.

A desk-based review of historic records has been undertaken using a variety of resources. A map of the designations local to the development site is attached as Appendix 6.1. A Zone of Theoretical Visibility (ZTV) overlay highlights the areas within the landscape where the proposed development is theoretically visible with indirect impacts. To present a more realistic impact of visual effect, the ZTV has been calculated taking into account woodland and built-form available on OS mapping aligned with aerial imagery.

Study will concentrate on the historic assets considered at risk of potential direct and indirect effect from the development proposed at the Safari Park. Cumulative impacts are negligible given the lack of renewable energy development within the intervening landscape and have therefore been omitted.

## 6.6. Identified Heritage Assets

Desk-based assessment has identified heritage assets located within the search area, as illustrated in Appendix 6.1. It is noted that there are no World Heritage Sites, Battlefields, Scheduled Monuments or Parks and Gardens within the study area within the study area. Though the wider Safari Park consisted of parkland associated with the large imposing Spring Grove House, the landscape is no longer designated as a historic park and garden.

### 6.6.1. Listed Buildings

Listed Buildings are designated buildings, structures and/or objects due to their special architectural or historic interest and represent the very best examples of built heritage. All seven Listed Buildings within 1km are detailed in Appendix 6.1 and Table 6.7, illustrating the position of these heritage assets in relation to the theoretical visibility of the solar array proposed at WMSP.

**Table 6.7 Listed Buildings within 1km of the Site**

| NHLE Ref. | Name | Designation | Distance (km) | Within ZTV |
|---|---|---|---|---|
| 1099951 | 108 and 110, Kidderminster Road | II | 0.8 | × |
| 1099961 | Spring Grove | II | 0.22 | × |
| 1166911 | Barn and Stables attached to East of Spring Grove Farmhouse | II | 0.66 | × |
| 1166922 | Stable Court about 50 metres South of Spring Grove | II | 0.21 | × |
| 1348673 | 111, Kidderminster Road | II | 0.81 | × |
| 1348680 | Cow House about 40 metres North of Spring Grove Farmhouse | II | 0.68 | × |
| 1348681 | Gates and Gate Piers about 275 North of Spring Grove | II | 0.24 | × |

[27] As per Table 6.3

Table 6.8 details four Listed Buildings outwith the 1km study area that have been identified by WFDC Conservation Officer as requiring further assessment due to the potential for co-visibility within the landscape. Co-visibility is where there may be no direct inter-visibility between a heritage asset and the proposed development but both the proposal and the asset may be viewed at the same time and therefore the significance of the asset or its setting may be detrimentally impacted.

**Table 6.8 Prominent Designated Heritage Assets (LBs)**

| NHLE Ref. | Name | Designation | Distance (km) | Within ZTV |
|---|---|---|---|---|
| 1348266 | Winterdyne | II* | 1.74 | × |
| 1167709 | Wassell Wood House Garden | II | 1.67 | × |
| 1167685 | Hoarstone Farmhouse | II* | 1.38 | × |
| 1099966 | Church of St Anne Bewdley | II* | 1.87 | × |

### 6.6.2. Other Heritage Assets

Appendix 6.1 illustrates the position of additional heritage assets within 2km of the development site, being two Conservation Areas and one Scheduled Monument. These assets are also identified in Table 6.9.

**Table 6.9 Additional Historic Assets with 2km of Site**

| NHLE Ref. | Name | Designation | Distance (km) | Within ZTV |
|---|---|---|---|---|
| | Blakebrook[28] | Conservation Area | 1.76 | × |
| | Bewdley[29] | Conservation Area | 1.06 | Partially |
| 1014743 | Moated Site in Wassell Wood, 400m South of Timpley Green | SM | 1.99 | × |

## 6.7. Impact Assessment

Appendix 6.1 illustrates the position of those assets within the surrounding landscape alongside the calculated ZTV. As illustrated, five Listed Buildings are positioned within the boundary of the WMSP, with the remaining two Listed properties within 1km positioned off Kidderminster Road on the fringe of Bewdley, as listed in Table 6.7. Whilst recognised for their historic value, the contribution they make and therefore their significance in the local historic environment is not altered by the proposed development as they are not within the potential ZTV. Designations falling outwith the ZTV, or only partially within, are unlikely to experience views of the solar array proposed, with no resultant indirect impact posed. Whilst the omission of views alone does not mean no impact, the setting of assets within the landscape are unlikely to be altered, therefore not warranting detailed assessment. As such, Blakebrook and Bewdley Conservation Areas, as well as the Scheduled Monument in Wassell Wood, will not be assessed further due to lack of potential impact.

As highlighted by the WCC AAS, significant surveying efforts have been undertaken at the WMSP over the years in support of various development opportunities. Surveys and reporting confirmed no features of archaeological

[28] WFDC: https://www.wyreforestdc.gov.uk/planning-and-buildings/conservation-areas-and-listed-buildings/what-is-a-conservation-area/conservation-areas-in-wyre-forest/blakebrook/
[29] WFDC: https://www.wyreforestdc.gov.uk/planning-and-buildings/conservation-areas-and-listed-buildings/what-is-a-conservation-area/conservation-areas-in-wyre-forest/bewdley-conservation-area/

significance were discovered. As such, it is concluded that onsite buried remains are unlikely at the site outlined for development with no direct physical impact posed to below ground artefacts.

### 6.7.1. Prominent Heritage Designations – Co-Visibility

As per the request of the WFDC Conservation Officer, four prominent Listed Buildings require further assessment so as to establish the degree of co-visibility between the identified heritage assets and the proposed development, as well as the sensitivity of that view to the significance of the setting of the assets. These are detailed in Tables 6.10 – 6.13.

**Table 6.10 Winterdyne**

| NHLE Ref | List Entry Name | Scale of Sensitivity | Appendix |
|---|---|---|---|
| 1348266 | Winterdyne[30] | Medium | 6.2 |

**Significance:** This asset is a Grade II* house dating from the mid-18th Century with some late 19th and mid-20th Century alterations. The front elevation faces south-west. It is of three storeys, constructed with stuccoed brick with a hipped roof of slate. The NHLE list description states "*modillioned cornice, three windows: glazing bar sashes under segmental heads, central window with a large lunette shaped recess, second floor: six-pane sashes under segmental heads; ground floor: advanced with flat roof and parapet, two bow windows each with three glazing bar sashes; central entrance has a portico distyle in antis, entrance has a large fanlight with keystone and a two-leaf half-glazed door*". The interior is reported to have plastered ceilings in an Adam style.

As an 18th Century country house, the significance of this asset arises from its age, architectural style, as well as its setting on a wooden ridge with views south-westerly from the front elevation and over the River Severn from the rear of the building.

**Impact Assessment:** As defined by its Grade II* listing designation, this scale of sensitivity for this asset is **Medium**. The site of the proposed ground mounted solar array is 1.74km away from this asset in a northeasterly direction and therefore no physical impact to the asset will occur.

Appendix 6.2 highlights the potential areas where both Winterdyne and the proposed solar array may be viewed at the same time. As illustrated, the potential co-visibility will be limited to small areas of farmland to the northwest and southeast. Consequently, the context of the heritage asset will not be significantly impacted and therefore the setting of the Listed Building will not be changed in a way that alters the perception of understanding, appreciation or experience of the asset, in line with guidance within the NPPF and Historic England's Advice Note 3. The magnitude of impact will be **Low** with only minor changes to the setting of the asset, or to the potential co-visibility with the proposal within the wider landscape, and therefore the significance of effect is correspondingly **Minor**.

| Magnitude of Impact | Low | Significance of Effect | Minor |
|---|---|---|---|

[30] NHLE Description: https://historicengland.org.uk/listing/the-list/list-entry/1348266

Table 6.11 Wassell Wood House

| NHLE Ref | List Entry Name | Scale of Sensitivity | Appendix |
|---|---|---|---|
| 1167709 | Wassell Wood House[31] | Medium | 6.3 |

**Significance**: Dating from the early 19th Century with some mid-20th Century alterations, this asset is designated as a Grade II Listed Building. The elevation to the garden is of "*two storeys, three gables with blind lancets. Three windows: 3-lights under square heads with square labels*". The ground floor has a "*central loggia with three-bay arcade, central 2-centred arch flanked by two smaller arches, with casement behind*" with an additional canted bay window to the right.

The age of this asset is therefore inherently linked to its significance, as well as its architectural style, being a good example of a building of its type.

**Impact Assessment:** In line with the NHLE designation as a Grade II Listed Building, the sensitivity of this asset is **Medium**. There will be no direct physical impact to this asset due to the proposed solar array site being 1.67km away in a south easterly direction.

Appendix 6.3 illustrates the locations of theoretical visibility of the proposed development in conjunction with Wassell Wood House which shows that co-visibility may occur between the Listed Building and the solar array, mainly in more wide-ranging views from surrounding farmland.

Regardless, the building is oriented to have views westward over the River Severn. As the proposed development is to the south, there will be no impact to the significance of the Listed Building, its setting, or views to/from the asset. Consequently, in line with the NPPF and the guidance contained within Historic England: The Setting of Heritage (Advice Note 3), this proposal will not adversely affect the contribution of the view to the significance of the heritage asset nor the ability to understand or appreciate that importance. It is important to also note the existing natural screening between the heritage asset and the proposal which will mitigate the potential visibility. As such, while co-visibility may occur, the impact on the character and/or appearance of the integrity of the heritage asset is not considered to be to a level that will negatively affect the ability of the asset to be understood, appreciated and experienced. The subsequent magnitude of impact of the proposed installation of the solar array is therefore defined as **Low** with the significance of effect being **Minor**.

| Magnitude of Impact | Low | Significance of Effect | Minor |
|---|---|---|---|

[31] NHLE Description: https://historicengland.org.uk/listing/the-list/list-entry/1167709

Table 6.12 Hoarstone Farmhouse

| NHLE Ref | List Entry Name | Scale of Sensitivity | Appendix |
|---|---|---|---|
| 1167685 | Hoarstone Farmhouse[32] | Medium | 6.4 |

**Significance:** The NHLE describes this Grade II* farmhouse as dating from the early 17th Century with some early 18th Century remodelling and late 20th Century alterations. The asset is of timber-frame, partially brick clad with sandstone ashlar. The garden elevation, looking South-east, is "*of brick; two projecting cross-wings with two-storey gabled porch in angle to right and dentilled band to ground floor*". The building is of two storeys with an attic. There are two ground floor entrances, one via a 19th Century studded plank door which sits to the left of a central window and the other is a 17th Century studded door to the left-hand return of the front porch.

The significance of this asset therefore is drawn from its age and the quality of historic fabric remaining.

**Impact Assessment:** Due to the Grade II* listing designation of this asset, the scale of sensitivity is defined as **Medium**. Direct physical impact will not occur due to this asset being 1.38km from the proposed development site.

Located slightly closer to the proposed development site than the Grade II Listed Wassel Wood House (Table 6.11), Appendix 6.4 shows the potential zone of theoretical visibility of both Hoarstone Farmhouse and the proposed solar array at WMSP, which illustrates that co-visibility may occur between the Listed Building and the solar array in more wide-ranging views within the Historic Environment, particularly immediately around Hoarstone Farmhouse and within the wider Safari Park.

However, in line with the NPPF and the guidance contained within the Historic England document The Setting of Heritage (Advice Note 3), this proposal will not adversely affect the contribution of the view to the significance of heritage asset nor the ability to appreciate the importance of the asset. It is important to also note the existing natural screening between the heritage asset and the proposal which will mitigate the potential visibility. As such, while co-visibility may occur, the impact on the character and/or appearance of the integrity of the heritage asset is not considered to be significant. The magnitude of impact will therefore be **Low**, and the resultant significance of effect will be **Minor**.

| Magnitude of Impact | Low | Significance of Effect | Minor |
|---|---|---|---|

[32] NHLE Description: https://historicengland.org.uk/listing/the-list/list-entry/1167685

Table 6.13 Church of St Anne, Bewdley

| NHLE Ref | List Entry Name | Scale of Sensitivity | Appendix |
|---|---|---|---|
| 1099966 | Church of St Anne, Bewdley[33] | Medium | 6.5 |

**Significance:** Situated within the town of Bewdley, this Grade II* asset was originally a chapel, though is now the parish church, by Thomas Woodward of Worcester and Richard Woodward of Chipping Campden. The tower dates from 1695 - 6, with the rest of the church dating from 1745 – 8. There are some late 19th and late 20th Century repairs. The church is constructed of ashlar stone with a hipped roof with machine tiles.

The significance of the building comes from its age and architectural quality as well as the visibility of the tower within the surrounding landscape.

**Impact Assessment:** The scale of sensitivity of this asset is **Medium** due to its status as a Grade II* Listed Building. As this Listed Building is 1.87km from the proposed development site, no direct physical impact will occur.

As illustrated in Appendix 6.5, this map highlights the potential areas where both the Church of St Anne and the proposed solar array may be viewed at the same time. As can be seen, the potential co-visibility will be significantly limited to an area of farmland. Regardless, existing natural screening will mitigate any potential visibility. Consequently, the context of the heritage asset will not be impacted and therefore the setting of the Listed Building will not be changed in any way that alters the perception of understanding, appreciation or experience of the asset, in line with guidance within the NPPF and Historic England's Advice Note 3: The Setting of Heritage Assets. As such, the magnitude of impact of the proposal will be **Negligible** and the significance of effect will consequently be **Neutral**.

| Magnitude of Impact | Negligible | Significance of Effect | Neutral |
|---|---|---|---|

## 6.8. Conclusion

This chapter assesses the potential effects of the proposed development, whether direct or indirect on heritage assets or their setting. Development of any kind may have a negative effect on the historic environment if not sited correctly within the landscape, therefore it is essential to fully consider any impact on heritage assets and their setting. Best practice guidance advises that the effects from an inappropriately designed and/or sited development are difficult to mitigate.

There are seven Listed Buildings, within the 1km of the proposed development site. Additionally, there are two Conservation Areas and one Scheduled Monument within 2km of the proposed development site. These heritage assets are illustrated in Appendix 6.1 which shows that none of these heritage assets fall within the ZTV, though Bewdley Conservation Area will potentially have partial visibility of the proposal. As such, the impact of the development on the understanding or appreciation of these heritage assets within their surroundings, and therefore on the integrity of their significance, will be negligible.

Direct physical effects tend to relate to the construction phase of the development, causing damage to the historic fabric of an asset. In the case of the proposed development, this could result from the installation of the tree system fixtures, cable trench, electrical cabinet foundations and access over the ground to the construction site. No access tracks require construction within the development site, significantly limiting direct physical effect. Excavation onsite will be restricted to the cable trench required from the inverter to the GRP unit. Furthermore, the screw foundations proposed allow for installation of the frames with minimal disturbance to the wider site. With no records noted within, or near areas outlined for development as part of this proposal, there is a very low probability that buried remains could be disturbed. As such,

[33] NHLE Description: https://historicengland.org.uk/listing/the-list/list-entry/1099966

with no previous archaeological finds encountered during surveying efforts for developments within the Park, it is not foreseen that there will be any direct physical impact or destruction of buried historic artefacts as a result of the proposed development at any stage (construction, operation and decommissioning) and therefore there is a negligible physical impact on heritage fabric posed.

As noted within the methodology section, effects on setting of heritage assets tend to occur from the visual impact of development, for example in views and key vistas. At the request of the WFDC Conservation Officer, four prominent Listed Buildings within the surrounding landscape have been assessed in detail in order to establish the degree of co-visibility as well as the sensitivity of that view to the setting of the heritage asset (Tables 6.10 – 6.13). These Tables, along with Appendices 6.1 – 6.5 illustrating the ZTV, show that while potential co-visibility may occur, this is not considered to result in the proposed development being unacceptable, as the impact to the Listed Buildings, and/or their settings, will not be changed in a way that alters the perception of understanding, appreciation or experience of the heritage assets, in line with the NPPF and the guidance contained within the Historic England document The Setting of Heritage Assets (Advice Note 3). The magnitude of impact resulting from the introduction of a solar array to the existing historic environment as presented and assessed, can therefore be classed as **Low/Neutral**, with the overall significance of effect being **Minor/Neutral**. Consequently, the proposed development will be unlikely to adversely affect the Listed Buildings or their setting, and as such impact on the significance of these heritage assets and their ability to be understood within the wider historic landscape will be negligible.

In addition, it is important to note that the development can be classed as a temporary overlay on the historical agricultural landscape, and is wholly reversible, therefore there will be no permanent negative effect from the development.

As detailed, the historic environment has been considered with utmost importance when designing the development, especially given the sensitivity of heritage assets within the wider setting and potential views from elevated viewpoints. It is evident that a negligible impact is posed to the local and wider historic environment by the proposal of this development. The proposed solar array does not present an adverse or significant impact.

On this basis, the integrity of the existing known historic environment has been assessed, and it is consequently considered that the proposed development would not have an adverse effect on identified heritage assets. Consequently, through the robust assessment of the heritage assets, including their settings, which have helped to form the historic environment that the proposed arrays will sit in, it is determined that the impact of the proposed development on the overall historic environment is below a threshold which would cause significant harm to the character and/or appearance.

# 7. BIODIVERSITY NET GAIN STATEMENT

## 7.1. Introduction

Following the completion and presentation of the baseline survey at the development site at WMSP, further assessment has been undertaken by Cogeo's Ecologist to determine the enhancement measures required to deliver a Biodiversity Net Gain as part of this proposal. This chapter builds on the findings presented within the Preliminary Ecological Assessment submitted for this development.

The aim of this chapter is to:

- Identify the direct impacts of the proposed development on the biodiversity of the proposed development site and its links to the wider countryside.
- Establish the current value of the site to biodiversity.
- Ensure that the post-development biodiversity value of the site is improved by at least 10% on the original value.
- Inform the creation of an installation, management and monitoring plan that must be followed to install, maintain and improve the post-development habitats to achieve or exceed the prescribed targets.

### 7.1.1. Description of Proposed Development Site

The site is located within the northern extent of the West Midlands Safari Park (SO 80398 75868) in an area not accessible to the public, near to staff offices and carparks. It is approximately 1.02ha in size and is steeply sloping with a northwesterly aspect. Principally a fairly homogenous, grass-dominated, semi-improved neutral grassland sward with a single example of an immature standard (English oak), the majority of the site is bounded by semi-natural woodland and scrub. The area appears to be mostly unused except for a number of small areas of plantation woodland in its eastern extent, which are regularly harvested for brashing, utilised within the safari park, and a small open-air storage area extending from the hardstanding access point in the NW, which holds a number of old machines, decorations and materials. The site appears to be mown on a semi-regular basis and is also subjected to grazing by rabbits.

For more detailed description of the Proposed Development Site (PDS), please refer to the previously submitted Preliminary Ecological Assessment (undertaken in March 2022).

The site is known to house a breeding main sett for a clan of badger that utilise the PDS and the surrounding land for refuge, foraging and commuting. For more details regarding the use of the site by badger, please see the Badger Sett Survey undertaken in May 2022[34].

### 7.1.2. Description of the Proposed Development

The proposed installation comprises an array of 752 photovoltaic panels. The panels will be installed on a metal framework that elevates them from the ground. In order, to achieve the maximum possible levels of solar insolation, the panels will be orientated to face southeast and be mounted at an angle of 20°. The panels will be mounted in 13 parallel rows with a 4m wide gap between each row to allow access and to reduce the risk of shading by the adjacent

[34] Detailed information relating to the presence of sensitive protected species is omitted from this statement for Confidentiality reasons

row of panels. A substation will be placed in the southern corner of the site, and an electrical kiosk at the end of the cable run. A plan of the proposed development is shown in the attached Appendices 2.1-2.4.

Measurements taken from this plan allowed the calculation of the amount of land that will be directly underneath the installed panels, substation and kiosk to be 3808.18$m^2$ or 0.3808ha. The area to be used for staging is already formed of hardcore/hardstanding and is currently used as machinery storage areas and a carpark; thus no natural habitats will be lost through the use of these areas during the development.

The impact of creating the cable run associated with the array, has also been carefully considered. Whilst within the site, the cable run will be confined within habitat that will be created or enhanced post-intervention, and the works have therefore already been accounted for within this area. Once it has departed the sub-station towards the kiosk, it will travel in a trench under the existing track, through the historic gate and into the staff carparking area, avoiding the root protection zone of the trees near to its route. It is proposed this area of grassland be enhanced in the post-intervention design, so no additional loss of habitat will occur through these works. It will then travel under an existing carpark before it turns southeast under the existing road through the parking area to continue under the existing road to a kiosk located on existing concrete. Thus, this area has been omitted from the BNG as the net-gain made within this report will compensate for any minimal, short-term disruption caused by these works.

## 7.2. Original Onsite Baseline Biodiversity Assessment

The original assessment of the site for the purposes of this development was undertaken in May 2022, using the Natural England's Biodiversity Net Gain Metric 3.1. The baseline biodiversity, as shown in Appendix 7.1, has been adapted from the Phase 1 habitat classifications to fit the UK Habitat classifications, which is the categorisation system used by the Biodiversity Net Gain Metric Calculator. The Phase 1 survey that this data is based on was completed in May and updated in July 2022[35]. It was deemed unnecessary to complete a full NVC assessment on the swards within the PDS, due to the anthropogenically installed nature of the habitats, current and historic semi-intensive management.

### 7.2.1. Calculation of Parcel Area

Habitats of the same type have been grouped into parcels to enable the accurate establishment of habitat loss in each category. The boundaries of each habitat parcel have been digitised using GIS software, and the area of each polygon calculated by the software's geometry tools. Due to the very small size of some of the habitat parcels within the site, the metric will be calculated in $m^2$ instead of the standard hectare units. This will not alter the calculation of the percentage net gain and will allow the habitats within the site to be better accounted for. It is not possible to change the units in the metric spreadsheet due to the set-up of the document, **but all area measurements, throughout the metric and this report will be in $m^2$**. The area of the urban tree has been calculated using the tool within the metric.

### 7.2.2. Setting Strategic Importance of Parcels

The PDS is not known to be included within any strategic strategy set out by the LPA; however, the areas within the PDS are deemed to have a potential ecological value due to their connectivity to nearby natural habitats and lower disturbance, hence it will be categorised as 'Location ecologically desirable but not in local strategy' (multiplier = 1.1).

[35] Available on request

### 7.2.3. Classification of Ecological Condition

Each habitat parcel was compared against the condition criteria set out in the Technical Supplement for Natural England's Biodiversity Net Gain Metric, based on visual inspection during the site visit to complete the Phase 1 survey.

**Grassland** - G1 was classified as 'other neutral grassland' (g3c) for the purposes of the BNG metric and has been deemed to be in "moderate" ecological condition, according to the condition assessment sheets provided with the metric (accompanying spreadsheet – Habitat Condition assessment sheets). G2 has been classified as 'other neutral grassland with tall herb' (g3c16) for the purposes of the BNG metric and has also been deemed as in "moderate" ecological condition, according to the condition assessment sheets provided with the metric (accompanying spreadsheet – Habitat Condition assessment sheets). There is no distinction between g3c and g3c16 in the BNG metric calculations, so the parcels are deemed to be of the same classification for this purpose.

**Woodland** - The areas of plantation woodland (W1-W5), which have been historically pollarded and frequently harvested for fodder/forage materials for the large herbivores resident within the animal exhibits of the safari park, have been classified as 'Other broadleaved woodland types' (w1g7). The habitat parcels achieved a score of 19 on the indicators and thus are deemed to be of "poor" condition, according to the habitat condition assessment sheets provided with the metric (accompanying spreadsheet – Habitat Condition assessment sheets).

**Scrub** - The areas of bramble scrub (S1 & S2), along the eastern and southern boundaries (respectively) of the site, have been categorised as 'Bramble scrub' (h3d). In accordance with the 'Selecting Condition Sheet' tab of the habitat condition assessment sheets provided with the metric, the condition of the habitat is automatically set to "n/a".

**Urban tree** - One, immature (approx. 8m and not yet mast-producing), English Oak is noted as present within the PDS (T1). The tree achieved 3/6 of the condition criteria and therefore has been deemed of "moderate" condition according to the habitat condition assessment sheets provided with the metric (accompanying spreadsheet – Habitat Condition assessment sheets).

**Table 7.1 Summary of Onsite Baseline Biodiversity**

| Habitat Area Type | Parcel | Distinctiveness | Condition |
|---|---|---|---|
| Grassland – Other neutral | G1 | Medium (4) | Moderate (2) |
| Grassland – Other neutral | G2 | Medium (4) | Moderate (2) |
| Bramble scrub | S1 | Medium (4) | N/A (1) |
| Bramble scrub | S2 | Medium (4) | N/A (1) |
| Woodland – other broadleaf | W1 | Medium (4) | Poor (1) |
| Woodland – other broadleaf | W2 | Medium (4) | Poor (1) |
| Woodland – other broadleaf | W3 | Medium (4) | Poor (1) |
| Woodland – other broadleaf | W4 | Medium (4) | Poor (1) |
| Woodland – other broadleaf | W5 | Medium (4) | Poor (1) |
| Urban tree | T1 | Medium (4) | Moderate (2) |

### 7.2.4. Merging Parcels

Habitat parcels of the same habitat type and condition score have been merged to ensure more accurate computations after inputting data into the BNGM (Table 7.2).

**Table 7.2 Merged Parcels for Use in BNGM**

| Habitat Type | Condition | Component Parcel Codes |
|---|---|---|
| Grassland – other neutral | Moderate | G1 & G2 |
| Bramble scrub | N/A | S1 & S2 |
| Woodland - other broadleaf | Poor | W1, W2, W3, W4 & W5 |
| Urban tree | Moderate | T1 |

## 7.3. Updated Onsite Baseline Assessment

A park-wide BNG has recently been undertaken by Focus Environmental Consultants (April 2023)[36] which includes the areas within the original baseline assessment. The results obtained from the updated assessment will therefore be used to continue this new BNG assessment for all but one set of parcels, the coppiced woodland areas (W1-5). This is because it appears that the trees noted as present in the original assessment have been removed in the intervening period, now giving an updated assessment of mixed scrub.

**Photograph 7.1 Coppiced Woodland Parcel on Original Assessment (May 2022)**

[36] Commissioned by, and undertaken on behalf of West Midland Safari Park

**Photograph 7.2 Coppiced Woodland Parcel on Updated Assessment (2023)**

The original assessment of the area as "coppiced woodland" will therefore be used throughout this report and accompanying metric calculations.

**Table 7.3 Updated Baseline Onsite Parcels for Use within BNGM**

| P/W BNGM | Dev BNGM | Habitat Type | Condition | Size ($m^2$) | Component Parcel Codes |
|---|---|---|---|---|---|
| 152 | 1 | Grassland – other neutral | Moderate | 9017 | G1 & G2 |
| 56 | 2 | Bramble scrub | N/A | 0463 | S2 |
| 55 | 3 | Mixed scrub (minus previous area of coppice woodland) | Moderate | 1796-231 =1565 | S1 |
| n/a | 3 | Woodland - other broadleaf | Poor | 231 | W1, W2, W3, W4 & W5 |
| T185 | 4 | Urban tree | Moderate | 366 | T1 |

## 7.4. Onsite Post-Development – Habitat Change

When considering the biodiversity net loss due to the construction of the array and infrastructure, ***without any mitigating intervention***, it can be seen that approximately 3818$m^2$ of 'natural' habitats will be 'traded' for developed habitats, as they will be located directly under the array or the substation. Although it should be noted that whilst the entire area under the panels has been included in this figure, it is unlikely that the whole area under the array will remain bare/unvegetated. From previous experience, it is deemed likely that the grassland habitat will be able to colonise up to approximately a third of the width of the footprint from the edges. However, there is not enough evidence/consistency between sites to account for this potential additional grassland habitat and thus the entire area under the framework has been assumed to be persistently bare for the calculations in this model.

**Grassland** – 3586.9$m^2$ of grassland has been lost to development. This represents a unit loss of 31565.60

**Scrub** – All of the scrub has been retained post-development. No unit loss.

**Woodland** – All (231$m^2$) of the woodland has been lost to development. This represents a unit loss of 2032.80

**Tree** – The only tree has been lost, representing a unit loss of 3220.8.

**Table 7.4 Summary of Onsite Habitat Change Post-Development (Prior to Intervention)**

| Habitat | Baseline | | Post-Development | | Change | |
|---|---|---|---|---|---|---|
| | Area ($m^2$) | Units | Area ($m^2$) | Units | Area ($m^2$) | Units |
| Grassland | 9017 | 79350 | 5430 | 47784 | -3587 | -31566 |
| Scrub | 2028 | 15809 | 2028 | 15809 | 0 | 0 |
| Woodland | 231 | 1016.4 | 0 | 0 | -231 | -1016.4 |
| Tree* | - | 3220.8 | - | 0 | - | -3220.8 |
| Urban | 0 | 0 | 3818 | 0 | 3818 | 0 |
| **TOTAL** | **11276** | **99396** | **11276** | **63593** | **0** | **-35803** |

**Area (366$m^2$) counted as additional to the surface area of the habitats identified as it is a 'vertical habitat/area'*

Without any intervention within the retained habitats, the BNG metric has calculated a significant biodiversity net **loss** (36.02%) within the site, as a result of the installation of the proposed development. See Appendix 7.2.

## 7.5. Rationale for Post-Intervention Habitat Design

There are many factors to consider when designing the post-intervention habitats to mitigate for loss caused by a development. These are discussed in this section.

### 7.5.1. Existing Abiotic Factors

The PEA has found that the historic land-use of the PDS appears to be moderately neglected grassland/pasture, although it does not appear to have been grazed for a considerable period and has no longer evidence of any stock fencing along the margins of the site. The sward is grass dominated and has evidence of a number of herbs associated with agriculture (e.g. docks, thistles and white clover), but also has a number of species associated with less modified swards (e.g. speedwells and mouse-ear). There are no signs within the sward that there has been significant artificial nutrient enrichment during recent management, although the growth rate of the sward despite the north-westerly aspect of the slope suggests that the soil is not nutrient poor.

These factors are not deemed likely to impact the feasibility of improving the biodiversity and condition of the sward significantly in the long-term, if the dominance of the grasses and rank herbs can be successfully addressed through the management and appropriate supplemental seeding. However, it should be noted that enhancement to any habitat of a higher distinctiveness is unlikely, without extensive and highly invasive management (e.g. topsoil stripping or broad habitat type change).

To increase the likelihood of success of achieving net-gain, a short programme of nutrient stripping should be considered in the management plan. Due to the presence of badger within the PDS, mechanical/physical means of nutrient stripping (i.e. removal of top soil or inversion ploughing) are not appropriate Therefore, a management plan, which aims to deplete the nutrients gradually through successive relatively high-level, cut-and-remove procedures, will be applied for the first 1-3 years, with the aim of allowing the establishment of a wider diversity of grassland plants over a prolonged period whilst maintaining a level of ecosystem functionality.

The site is considerably sloping with the sediments on the high ground in the east being considerably less wet than those in the west. This should be considered when assessing the compatibility of any species introduced to the site as part of the post-intervention design.

### 7.5.2. Existing Biotic Factors

**Grassland** – the existing grassland sward within the PDS is deemed to be of a "moderate" quality, let down from achieving good condition by its reduced floral biodiversity; the high prevalence of sub-optimal floral species; and moderately intensive management. Actions to enhance these habitats should include;

- *Improving floral biodiversity of sward* - Whilst there is no baseline data for the condition of the sward at the time more intensive agricultural management ceased, the current status of the sward is not yet significantly different from that expected from good examples of a currently/recently grazed pasture. Thus, it is assumed that the natural regeneration/improvement of the sward from the seedbank or dispersal from the surrounding environment is likely to be negligible. Therefore, it is recommended that introduction of additional, appropriate, native, species from a source with local provenance is undertake (i.e. supplemental seeding/planting). The inclusion of a number of species that parasitise grasses is advised, to reduce the dominance of grasses within the sward allowing more resource to developing forbs.
- *Reduction of collective cover of suboptimal species* – Widespread use of herbicides within the PDS is not appropriate due to the presence of badger. However, specialist advice could be sought regarding limited and highly-targeted application (e.g. weed-wicking) of highly-specific chemicals to reduce the coverage of docks and thistles within the PDS. Otherwise, hand removal of larger specimens combined with well-timed nutrient-stripping vegetation cuts, at an appropriate height and to coincide with seed production/dispersal of these species, is likely to show results over a longer period.
- *Installation of a less intensive management plan* – Upon the completion of the nutrient stripping protocol, installation of a management plan that is more conducive to the successful production and maturation of seeds from a wide range of grassland forbs will encourage the long-term proliferation of a biodiverse sward, without favouring specific species. The traditional hay meadow management technique, which alternates between two-cuts a year and a single cut a year, is widely accepted to be among the gold-standards for grassland management.

**Scrub** – There are no longer any criteria available to assess the condition of the bramble scrub using the BNGM, and thus no official way of improving the condition status of this habitat. In addition to this, it is understood that no clearance of bramble scrub will be required to facilitate the installation of the development. Ongoing management of these habitat areas will be minimal intervention, edge management to prevent the habitat's encroachment into the grasslands.

**'Coppiced' woodland** – The woodland present within the site has been deemed to hold negligible conservation value, due to their intensive and peculiar historic management. It is deemed highly likely that, even with the retraction of management, the constituent specimens would reach the end of their life prior to creating a closed canopy or supporting nesting habitat even within the small, isolated areas of plantation.

**Fauna** – There is a recognised lack of solid scientific research regarding the direct impact of solar arrays on biodiversity, not only in the UK but across the world. However, the PEA has highlighted that the key faunal species of concern, in respect of the development of the land within the PDS, are badgers, birds and bats. Thus a literature review regarding both the known and potential impacts a solar development might have on these taxa was performed. Only 5 relevant papers/reports were found – Armstrong et al, 2016; Blaydes et al, 2022; BSG Ecology, 2019; Montag et al, 2016; and Parker & McQueen, 2013. None of these papers referenced badgers in any way. The others appear to conclude that there is no significant difference between the control plots and solar plots when considering; bee and butterfly diversity; numbers of bird species, ground-nesting birds' territories or foraging behaviour; or number of bat species and bat passes. In fact, a significantly higher number of invertebrates were found within solar compared to non-solar plots,

and the solar plots in the studies were better for bird species of concern, raptors and hares, presumed to be a factor of the enhancements made to the sites and the more ecologically attuned management regimes employed within the sites.

**Badgers** – Badgers are known to be utilising the site for refuge, foraging and commuting. An active, breeding, main sett is known to be present near the site. Additional survey works have also located a number of associated active setts and foraging signs within the grounds of the safari park. The sett within the PDS has been accounted for in the design of the proposed development, including a **minimum of 10m buffer** between the sett entrance and the construction zone. This is deemed sufficient to protect the sett from direct disturbance, as it is proposed that the array supports will be anchored utilising the tree-root system. This system will cause minimal disturbance to the ground, as there will be no requirement for excavation or piling to install the panels, minimising the noise and vibration pollution caused during the installation process. In addition to this, the sett entrances travel into the bank moving away from the proposed development, suggesting that the sett is contained within the bank to the east, continuing under the improved grassland to the east. The ground within the PDS is significantly lower than the majority of the sett entrances, all of which penetrate the bank. Thus, the sett will not require intervention in the form of temporary closure to facilitate the installation. In addition to this:

- Free and easy access is the linchpin in the continued ecological functionality of the PDS for badger, and it is therefore of the upmost importance that access by badger to the sett or PDS is not in any way hindered prior to, during or post-development. It is understood that no additional security fencing or lighting will be installed within or around the PDS due to the completion of the proposed development, and thus the levels of disturbance to the badgers' access and nocturnal behaviours should be minimally impacted upon completion of the development. It is also imperative that there is no completion of works or use of artificial lighting between dusk and dawn during the construction phase. Whilst the need for excavation is very low due to the installation methods, some excavation is planned for the cabling, so all excavations must be covered both overnight and whilst not in use, or have suitable escape ramps (i.e. installation of a roughened plank or use of chamfered edges).
- An extremely important consideration within the post-intervention design is that suitability for use of the sward by badger is optimised within the constraints imposed by aforementioned abiotic factors. The optimal sward for use by a foraging badger is relatively short grassland with areas of bare soil, where the earthworms will come to the surface to mate. Badgers are also known to predate seasonal fruit and masts opportunistically, so installation of a small area of fruit/mast bearing woody species is likely to be beneficial to the populations foraging within the PDS.

**Bats and Birds -** Bats are thought to be utilising the neighbouring woodland to roost, forage and commute, although it is not yet fully understood how they are utilising the PDS. A range of birds have been noted foraging within or commuting through/over the PDS. It is assumed likely that both taxa are using the PDS primarily for foraging and commuting purposes, in combination with other areas of neighbouring habitat, as there is negligible bat roosting and limited nesting resource provided by features within the site. It is deemed highly unlikely that the installation would add any roosting potential to the site, because of the poor thermal properties offered by the open-sided array, the unenclosed nature of which also eliminates any entrapment risk within the structure. However, birds have been known to utilise the framing of solar arrays to support nests.

It is highly likely that the grassland within the PDS would be deemed a sub-optimal foraging resource, compared to nearby invertebrate rich habitats (e.g. wet woodland, mature broadleaf woodland, scrub, muck heaps and open water) within the boundaries of the park, for both bats and birds due to its management regime and relative paucity of floral diversity reducing the invertebrate diversity and biomass. It is therefore deemed likely, as found in the aforementioned academic studies, that the installation and maintenance of a better sward within this area might result in a bottom-up

resource improvement, increasing the diversity and biomass of their invertebrate prey species and thus strengthening the resource with few negative impacts.

The only negative impact noted by the papers is the potential of increased collision risk, but this is deemed negligible for bats due to their echolocation system easily picking up the static (i.e. not portable) nature of the installed array and the lack of moving parts within the array which might cause distortions in echolocations. However, there are documented cases of birds mistaking large arrays for areas of open-water, causing collision risk to be greater for birds, because, unlike bats, many species will actively enter/sit on bodies of water. However, this is not a well-documented phenomenon and thus is deemed likely to be an uncommon and infrequent but unfortunate occurrence. In addition to this, the slope of the array should reduce the appearance of the array as a body of water, reducing collision risk further.

*Glint and Glare* – The potential for the panels to reflect light that may cause a nuisance in areas previously not illuminated.

*Day-time* – Due to the angle of the panels the angle of the reflected light will be skyward for much of the day, thus eliminating the risk of disturbance to the ground level habitats (i.e. ground-nesting birds, etc). However, due to the azimuth of the sun passing over the panels east to west, as well as the perceived change in height of the sun on its passage, the reflection will have potential to impact habitats to the east and west of the array as well as north and south. In this case, the array is surrounded by mature woodland, with the potential to host roosts by both bats and birds. It is therefore imperative that sufficient investigations are undertaken to ensure that the underside of the canopy and/or any potential roosts are not illuminated by reflected light from the array.

*Night-time* - Whilst a small amount of moonlight may be reflected by the panels, it would be no more than that from a water body and thus would not render a disturbance to the bats. In addition to this, no external lighting will be installed with the array and thus there is no risk of artificial light being reflected by the panels.

### 7.5.3. Interaction of Imposed Design with the Installation

For optimal operation, the solar panels will need to absorb the maximum amount of solar radiation possible. Therefore, it is imperative that the maximum height of the installed sward be carefully considered in the design to prevent shading of the panels. The panels are planned to be mounted on stands, so the closest point the panels get to the ground is therefore deemed to be the maximum height of the installed vegetation when it's mature.

There will be a requirement to access the panels periodically to undertake routine maintenance and repairs. Whilst planned maintenance can be scheduled to fit into the ongoing vegetation management plan, incidental/emergency repairs are unpredictable, and the ideal scenario would be to not to have to clear the sward to undertake these activities, as such clearance will reduce the ecological value of the area for a considerable period. Therefore, scrub, tall herb and tussock forming assemblages are deemed less suitable than other grassland habitat types which are likely to suffer less long-term damage through any clearance for vehicular access.

The positioning of the rows of the array, combined with the gradient and aspect of the slope, will result in no direct sunshine being experienced by the sward between the rows for much of the autumn and winter. The area shaded will reduce in spring and summer, but at least a third of the sward will not see direct sunshine throughout the year. Vegetation between the panel rows will thus largely have to rely on scattered light for much, if not all, of the year. Therefore, the species included within the seed mix installed within this area must be heavy-shade tolerant.

## 7.6. Achieving Biodiversity Net Gain

### 7.6.1. Rules of Habitat Trading/Enhancing

The Net-gain principle employs an understanding that all 'habitat trading' be done not only trading up' (i.e. for better quality/distinctiveness habitats) but also on a 'like-for-like' basis in terms of habitat type (i.e. areas of woodland lost must be replaced with woodland and cannot be replaced with an area of wetland or other habitat type).

Whilst it is possible to produce Biodiversity Net Gain by creating a much smaller but significantly more diverse and better-quality area of habitat, the metric discourages this through the use of difficulty and temporal multipliers. This is because these types of plans are highly likely to fail as the target habitat types are incredibly complex to implement, if successful installation is indeed at all possible. The competent authority assessing the proposals are almost certain to reject these types of proposals, so the creation/enhancement of similarly sized, feasible/realistic habitats in well-sited areas, as close as possible to the traded habitat are the preferred method for achieving biodiversity net gain.

In addition to this, any eventualities that would occur anyway, for example improvements to the sward that would have occurred naturally over time without intervention, cannot be claimed as gains within the system.

### 7.6.2. Onsite Habitat Enhancement

As many as possible of the enhancements to mitigate for biodiversity loss to the identified habitat types will be made on site. However, due to the small size of the site, the options are limited.

**Grassland (G1&2)** - The current moderate quality grassland sward will be enhanced to a fairly good quality through supplemental seeding (native 80:20 wildflower-grass heavy shade tolerant seed mix including some grass-parasitic species (e.g. Yellow rattle and Eyebright) at max. 0.25kg per 100m$^2$) and the installation of a management plan, more conducive to creating and maintaining a good condition sward (i.e. traditional hay meadow management regime or similar). Additional grassland habitats, of the same quality as the enhanced grassland, will be created in the current areas of coppiced woodland and under the urban tree, which are not directly under the array, through the same means.

**Woodland** – as previously identified, tree planting within the site is not conducive to the maximum efficiency of the proposed development and thus there are no enhancements that can be made within the PDS for the woodland habitat.

Despite enforcement of such a scheme, the maximum amount of feasible remediations to the undeveloped areas within the site, the **net loss** can only be reduced to 28.98%. Therefore, a significant amount of habitat trading/enhancement off site, will be required to achieve a 10% net gain.

### 7.6.3. Selection of Offsite Areas

The onsite habitats that will suffer a reduction in biodiversity units, due to the completion of the proposed development, are grassland and woodland. Therefore, the most appropriate offsite areas would be nearby and of the same broad-habitat type, in which feasible enhancements can be made and maintained to create an overall net-gain in biodiversity. See Appendix 7.3.

### 7.6.4. Original Offside Baseline Habitat Data

The calculation of parcel size, setting of strategic importance and classification of habitat quality was undertaken in the same way for each offsite habitat area as for the previously documented onsite baseline assessment. As before, **all area**

**measurements, throughout the metric and this report will be in $m^2$**. The area of the urban tree has been calculated using the tool within the metric. The condition assessment sheets for each parcel can be found in the accompanying spreadsheet – Habitat Condition Assessments Sheets (WMSP update 2023).

**Grassland** – Three areas of grassland of varying quality have been identified within close proximity, with direct connectivity to the PDS, which with enhancement would mitigate for the loss biodiversity units within the grassland habitats of the PDS. These areas are shown as G3, G4 and G5 in Appendix 7.3. Due to the; presumed lack of seed-bank left after decades of moderately intensive management; lack of connectivity to any other good quality grasslands; and the fact the grasslands are surrounded by woodland habitats creating a barrier to dispersal of wind-blown seed from the wider environment, it is believed that these improvements would not occur naturally within the agreed management timeframe of the project and therefore are eligible to be counted within the BNG for this project.

G3 is a piece of semi-neglected, other lowland acid grassland found along the access road to the converted barn and the staff parking area. This grassland links to the PDS through the historic 5-bar-gate in the SE of the site and is subjected to the same management regime as the PDS. It has been assessed by the updated BNG and has been categorised as currently being of **poor** condition.

**Photograph 7.3 Typical Growth Form of G3**

G4 & 5 – These areas of grassland are the same habitat but have been considered separately, as they will receive different treatments in the post-intervention design. They have been managed for amenity purposes in a visitor-facing area of the park for a considerable period. During peak periods, they are used as overflow parking when required. The grassland is therefore managed more intensively than the other areas of grassland assessed in this report. It is heavily grass dominated, although it is not clear if this is due to specific management processes (i.e. weeding or application of grass feed/weedkiller compounds) or purely down to the more intensive management regime imposed on this area, making it less suitable for the proliferation of forbs. In addition to this, the area borders the PDS on the eastern edge and links directly to the area where the main badger sett is located. Whilst there are numerous areas of rabbit scrapes and a couple of historic mole-hills, there has been no evidence of any badger foraging remains found within this area on any of the surveys, despite the proximity of a number of active setts. This is another indicator that the sward no longer holds a strong resource for soil macroinvertebrates (e.g. worms, beetles etc.) indicating it is currently unlikely to hold much resource for either foraging badger or bats. The habitat parcels have been categorised as **Moderate** quality modified grassland according to the updated BNG.

Photograph 7.4 Typical Growth Form of G4 and G5

**Woodland** – An area classified as poor-quality woodland according to the BNG assessment criteria has been identified in an area bordering the PDS. The successful enhancement of this area of woodland to a good quality would compensate for the loss of the coppiced woodland within the site and would also bring a number of wider ecosystem services to the habitats within the park, including linking two healthy, established woodlands surrounding the area. Over 10% of the woody species in the area have perished; this is assumed to be due to the incompatibility of the species previously installed with the abiotic conditions, as the area is believed to be moderately wet and the previously installed species tend to prefer free-draining soils. It is therefore believed that the quality of this habitat can be significantly improved with the installation of appropriate species at appropriate densities. Due to the lack of sapling regeneration within this area, it is believed that the enhancements made in this scheme of works would be unlikely to take place within the management timeframe of the project without intervention and therefore can be claimed within the BNG process.

Photograph 7.5 Typical Growth Form of W6

**Table 7.5 Summary of Original Offsite Baseline Biodiversity**

| Habitat Area Type | Parcel | Distinctiveness | Condition |
|---|---|---|---|
| Grassland – Other lowland acid | G3 | Medium (4) | Moderate (2) |
| Grassland – modified | G4 | Medium (4) | Poor (1) |
| Grassland - modified | G5 | Medium (4) | Poor (1 |
| Woodland – Other broadleaf | W6 | Medium (4) | Poor (1) |

### 7.6.5. Updated Offsite Habitat Condition Assessment

The strategic importance and condition assessment have been taken from the updated assessment undertaken by Focus Environmental Consultants (April 2023)[37]. Areas have been converted to $m^2$ for more accurate calculations for areas of such a small size.

**Table 7.6 Updated Offsite Baseline Parcels for Use within BNGM**

| P/W BNGM | Dev BNGM | Habitat Type | Condition | Size ($m^2$) | Component Parcel Codes |
|---|---|---|---|---|---|
| 44 | Offsite Baseline 1 | Grassland – modified | Moderate | 8100 | G4 |
| 65 | Offsite Baseline 2 | Grassland – other lowland acid | Poor | 730 | G3 |
| 154 | Offsite Baseline 3 | Woodland - other broadleaf | Poor | 367 | W6 |
| - | Offsite habitat Creation 1 | Urban tree | Moderate | 1529 | T2 & T3 |

### 7.6.6. Splitting Parcels

In reality, parcels G4 and G5 are the same habitat area but due to the restrictions of the BNGM they have had to be split into two different parcels that reflect the post-intervention design as it is not possible to have two different outcomes from enhancement within a single parcel as required by the design.

### 7.6.7. Enhancing Offsite Habitats

This section should be read in conjunction with Appendix 5.4.

**Grassland** - G3 – the current poor quality grassland sward will be enhanced to a moderate quality through appropriate supplemental seeding (i.e. native 80:20 wildflower-grass seed mix including nectar-rich flowering forbs and some grass-parasitic species (e.g. Yellow rattle and eyebrights) at max. 0.25kg per $100m^2$) and the installation of a management plan, more conducive to creating and maintaining a good condition sward (i.e. traditional hay meadow management regime or similar) after short period of nutrient stripping cuts (See Table 7.6). This level of enhancement is deemed both achievable within the management period and to be the highest level without significant management effort.

G4 – will be subjected to a higher density supplemental seeding (i.e. native 80:20 wildflower-grass seed mix including nectar-rich flowering forbs and some grass-parasitic species (e.g. Yellow rattle and eyebrights) at max. 0.5kg per $100m^2$). Despite the parcel's poorer starting point, it is deemed that the recovery of the parcel will keep pace with that of the

[37] As previously noted, commissioned by and on behalf of WMSP

other parcels, because of the more significant reduction in the previously more intensive management plan and the improvements seen within the sward. However, to remain compliant with the Protection of Badgers Act 1992, it is advised that the G4 is no longer utilised as an overflow carpark, thus minimising the risk of disturbing any setts with entrances within the area of scrub to the south of the PDS which are likely to extend into this section of grassland. It is therefore advised that vehicular access to this area be restricted by a physical means (i.e. fenced off with a simple post and rail fence or similar) to prevent accidental vehicular access, and thus potential breach of the PBA 1992. However, this visitor-facing area is deemed to hold excellent potential for raising public awareness of the value of native biodiverse habitats for our native wildlife through the addition of interpretation panels (especially if the some of the bat/bird refugia were added to the Scots pine along the border with the PDS).

G5 – To ensure the continued infrequent the current use as an over-flow carpark, both the level of enhancement and reduction in management effort within this habitat parcel is reduced compared to that of other grassland parcels. In addition to this, it is deemed likely that the installation of a ground grid geocell type structure, backfilled with a mixture of new gravels and extracted subsoil would be beneficial in reducing damage to the sward through use by vehicles during and after periods of prolonged wet conditions. Subsequent enhancement of the sward will be undertaken through supplemental seeding using a 80:20 seed mix that comprises low growing forbs and grasses (e.g. Lady's bedstraw – *Galium verum*, Black medick *Medicago lupulina*, Field forget-me-not – *Myosotis arvensis*, Birds foot trefoil- *Lotus corniculatus*, Common bent – *Agrostis capilaris*, Crested dogstail – *Cynosaurus cristatus*, Smooth meadowgrass – *Poa pratensis* etc.) including some grass-parasitic species (e.g. Yellow rattle and Eyebright) max. 0.5kg per 100m$^2$. Alterations to the current management would take the form of a series of reduced frequency, higher-level cuts rather than the installation of a traditional hay management regime which would reduce access to the area for the majority of the growth season. Therefore, a regime of a maximum of 3-4 cuts per year should be adhered to. Cuts are deemed likely to be necessary as follows – 1 cut before easter (only if required), 1 cut before the summer peak season (Mid-June) and another within the peak summer season but no sooner than 6 weeks since the last cut (Mid- July to Early August), an additional cut may be required around the end of the growth season to prepare for Halloween and Christmas periods (mid-late October). If it is not deemed necessary to utilise the area as overflow parking, the area should remain uncut until it is required. During these cuts the sward should not be cut to below 7cm and the clippings should be removed.

**Woodland** - The tree supports should be removed from the existing trees within the area and not replaced. The empty space within the woodland should be planted with a range of native British provenance species that are tolerant to wetter soils (alder, willow and birch) in the north at the lower elevations and in the west nearer to the wet woodland, but some fruit and mast producing trees can be added into the mix in the southern and western extents of the habitat. Species diversity should broadly match that of neighbouring woodlands.

It is recommended that bare-rooted whips/feathered whips are installed directly into the existing ground flora. Planting should be undertaken at a density of approximately 2000 trees per hectare to allow for failure within the area. This is the equivalent of a maximum of 73 trees within the habitat parcel, at a spacing of approximately 1 tree per 5m$^2$, although additional measurements will be required to assess how much land is currently covered by existing trees to adjust the number of trees to be installed. To give the young trees protection from grazing by rabbits and any necessary management activities, they should be installed with a spiral tree guard and cane, which should be removed after 5 years.

Minimal management of the trees or the ground flora should be undertaken within the first 10 years, after which thinning of the trees may be required depending on the success of establishment/regeneration of the area.

**Urban Trees** - The immature oak (T1) removed from the PDS to facilitate the installation of the array will be mitigated for through the planting of two trees (T2 &T3) within the enhanced grasslands. These trees should be appropriate for the abiotic conditions present in the site (free draining and exposed) and be capable of achieving a large size on maturity (e.g. oak, beech etc.). It is highly recommended that the trees are planted with full root balls to maximise the chances of success and should not be less than 1.75m tall, feathered maidens upon their installation.

It is planned that within the management period of this project (30 years) the trees will grow to moderate quality for large trees. It is likely that the trees will develop to good condition with age, but this will take longer than 30yrs to accomplish and is thus beyond the scope of this project, therefore limiting their representation in this modelling exercise.

The exact location of the trees is not overly important, as long as they are located such that they will not need to be highly modified/removed in the future due to their placement (i.e. shading the array, risk of limb drop into the regular carpark etc.). They should have timber guards erected around their bases to ensure they are not damaged by maintenance, vehicular movement or careless/anti-social visitors and be subjected to a minimal intervention management regime.

A native, 30yr old tree that has been subjected to minimal intervention management (i.e. no regular pruning) and protected using a long-term timber guard/enclosure is should easily to meet the criteria of "moderate".

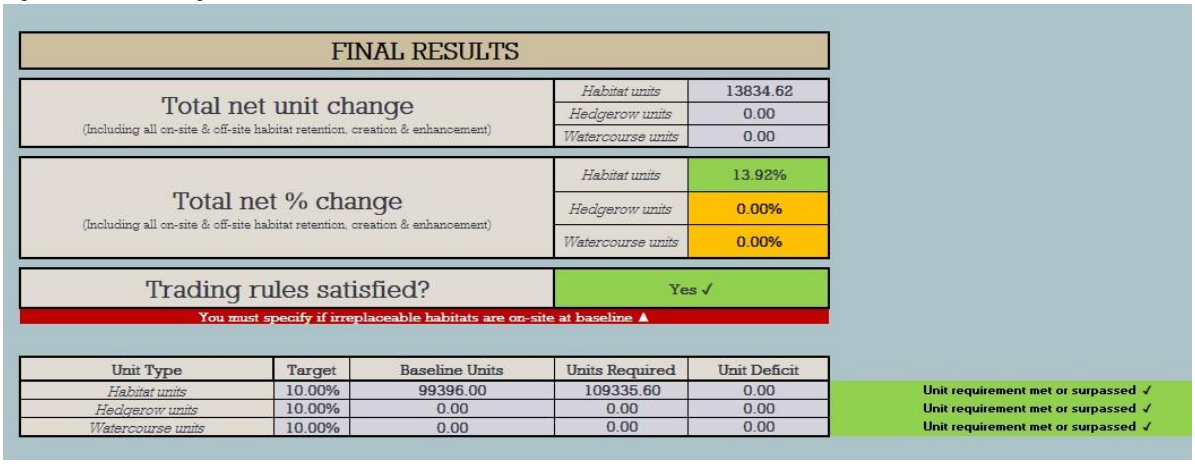
## 7.7. Post-Intervention Design

This section should be read in conjunction with Appendix 7.4.

### 7.7.1. Net Change

The summary provided by Natural England's Biodiversity Net Gain Calculator (Figure 7.1) shows that there is a net gain in units through the implementation of the proposed post-intervention design of 13.92% and that the trading rules are satisfied. There are no irreplaceable habitats within the on-site baseline.

**Figure 7.1 Net Change Results**



FINAL RESULTS

| | | |
|---|---|---|
| Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement) | *Habitat units* | 13834.62 |
| | *Hedgerow units* | 0.00 |
| | *Watercourse units* | 0.00 |
| Total net % change (Including all on-site & off-site habitat retention, creation & enhancement) | *Habitat units* | 13.92% |
| | *Hedgerow units* | 0.00% |
| | *Watercourse units* | 0.00% |
| Trading rules satisfied? | | Yes ✓ |

You must specify if irreplaceable habitats are on-site at baseline ▲

| Unit Type | Target | Baseline Units | Units Required | Unit Deficit | |
|---|---|---|---|---|---|
| *Habitat units* | 10.00% | 99396.00 | 109335.60 | 0.00 | Unit requirement met or surpassed ✓ |
| *Hedgerow units* | 10.00% | 0.00 | 0.00 | 0.00 | Unit requirement met or surpassed ✓ |
| *Watercourse units* | 10.00% | 0.00 | 0.00 | 0.00 | Unit requirement met or surpassed ✓ |

On further analysis of the more detailed data (Table 7.3), it can be seen that the proposed post-intervention habitat parcels deliver a net gain of biodiversity units in every represented natural habitat type, despite there being a decrease in some of the habitat areas. This has been achieved by the potential increase in habitat value achieved through enhancing and creating a number of habitats as previously discussed.

Figure 7.2 Detailed Results - Combined Change by Broad-Habitat Type

| Combined on-site and off-site change by broad habitat type | | | | | | |
|---|---|---|---|---|---|---|
| | Baseline | | On-site and off-site post-development | | Combined change | |
| Habitat group | Combined existing area | Combined existing value | Combined proposed area | Combined proposed value | Combined area change | Combined unit change |
| Cropland | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Grassland | 20768.00 | 131054.00 | 17181.00 | 139639.95 | -3587.00 | 8585.95 |
| Heathland and shrub | 2028.00 | 15809.20 | 2028.00 | 15809.20 | 0.00 | 0.00 |
| Lakes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sparsely vegetated land | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Urban | 0.00 | 0.00 | 3818.00 | 0.00 | 3818.00 | 0.00 |
| Wetland | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Woodland and forest | 598.00 | 2631.20 | 367.00 | 2745.62 | -231.00 | 114.42 |
| Intertidal sediment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Coastal saltmarsh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rocky shore | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Coastal lagoons | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Intertidal hard structures | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Watercourse footprint | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Individual trees | 366.00 | 3220.80 | 1529.00 | 5141.95 | 1163.00 | 1921.15 |

In reality, the outcome is probably better as previously touched upon, because the calculation assumes the area under the panels is considered to be 'lost to development'. However, in reality, a portion of this land is likely to be colonised by the grassland sward. In addition to this, the areas of bare earth caused by shading are likely to be beneficial to the badgers as the key species of interest in this area, as they will provide additional foraging areas where their main prey may come to the surface to breed. The addition of small areas of bare earth, will also enhance the mosaic of habitats throughout the PDS. These nuanced benefits are not able to be considered by the metric but should be considered as a beneficial component to the design.

## 7.8. Impacts and Mitigations

### 7.8.1. Habitat Fragmentation

There are currently no habitats of significant ecological value that are continuous from neighbouring areas and which would be impacted by any vegetation clearance undertaken to facilitate the development. However, the design of the habitat outcome has placed value on linking the network of existing woodlands bordering the site, which will be otherwise unmodified, thus improving the connectivity of this habitat to the areas outside of the PDS for terrestrial species.

The site has been identified as being used as a foraging, commuting and key refuge resource for a clan of badgers. It has also been identified that the principal passage from the main sett in the south to its well-used annex sett, in the woodland NE of the PDS, is through the top section of the PDS. Therefore, it is of the up-most importance that this connectivity is not lost or reduced in any way throughout activities associated with pre-construction, construction, the lifetime or decommissioning of the development.

*Avoidance Strategy* – It is understood that there is no requirement for any additional security fencing associated with the development. Any fencing used to mark buffer zones, to ensure disturbance isn't caused to the badger, will ideally be made using post & rail style structures, but if any netting/panels are used they must be raised from the ground by at least 25cm to ensure badger have free/easy access through the fence.

### 7.8.2. Habitat Modification and Loss

A degree of habitat modification and loss is unfortunately an inherent factor of development, both during the pre-construction/construction phase and the lifetime of the installation. In this case, the amount of habitat that will be removed from use by the resident wildlife will be minimal, because the unenclosed nature of the majority of the proposed development will allow physical access to the area under the array to remain intact. It has been carefully planned at all

stages of the development that habitat modification should provide a net gain in biodiversity value and that loss of habitat should be minimised at all costs.

*Avoidance strategy:* There are no statutory protected habitats or habitats deemed to have more than a medium ecological distinctiveness within the PDS, so there is no risk that development will occur within such habitats. In addition to this, all the original land surface, other than the land occupied by the footings of the stands and the inverter kiosk, will remain accessible.

*Minimisation strategy:* Pre-construction activities will include the clearance of areas of grassland, scrub and woodland vegetation to facilitate the completion of the works. These clearance works should be undertaken utilising best-practice techniques including, but not limited to, 2-cut vegetation clearance and soft-felling where appropriate. Clearance works should be supervised by an appropriately qualified ecologist or ECoW and completed outside of periods of vulnerability for the key species considered for this site. In this case that includes the bird-nesting season (Feb-August inclusive).

During construction, the metal stands installed to support the PV array will be anchored using a tree-root system, to reduce the need for disturbance/excavation of the substrate, meaning there are likely to be considerable areas of the original sward that will be recoverable within a comparatively short period of time.

*Compensation Strategy:* Several areas of heavily modified woodland and an immature oak are required to be removed from the site to facilitate the proposed development. To compensate for these lost parcels of habitat, a post-construction habitat design has been prepared to enhance the retained portions of original habitat parcels or to reinstate lost habitat in different areas that are sympathetic to the long-term needs of the resident wildlife and the development. However, aspects of this design are estimated to take up to 30 years of development before it is complete.

The habitat areas that will be removed currently hold the potential to provide refuge and nesting areas for a wide range of birds. Whilst no areas that would support a bat roost have been identified within these parcels, it is likely that such features would have developed within 30 years had the current habitat been retained. Therefore, to deal with the shorter and mid-term impacts of the immediate loss of habitat, during the recovery/enhancement of impacted habitats or development/succession of replacement habitats, appropriate artificial refugia will be installed within areas of retained habitat to maintain a similar refuge resource for small birds and bats. The installation of a minimum of

- 5 bird nesting boxes (mixed styles) within nearby woodland is deemed an appropriate level of mitigation for the loss of bird nesting potential;
- 3 stations, each with 3 bat boxes (i.e. Schwegler 2F or similar) installed at a minimum height of 4m, so that one box faces south-west, one box faces south and one box faces south-east to allow roosting bats to easily thermoregulate throughout the changing heat of the day, is deemed an appropriate level of mitigation for the loss of the potential to develop bat roosting areas.

### 7.8.3. Failure of Installed/Enhanced Sward

*Minimisation strategy:* The habitats that have been designed to be enhanced or created are moderately low risk and well within the capability of the abiotic conditions within the PDS to support with the installation of a minimal intervention management plan and the ongoing use of the areas. Therefore, the risk of failure is low. If the management plan is withdrawn, the risk of failure will be higher but not certain, due to the high suitability of the habitats within their proposed positioning. However, it is unlikely that the installation would be able to function fully if the sward were to succeed to the rank tall herb assemblage, due to the high degree of shading caused by the sward adding a greater incentive to maintain the management plan throughout the lifetime of the development. In addition to this, if the proposed post-intervention

habitats fail, there will be net loss in biodiversity throughout the PDS, and the development will be in breach of Local Planning Policy.

## 7.9. Installation, Management and Monitoring Plans

This section does not constitute either an installation plan, management or monitoring plan for the site post installation but aims to set the minimum standards to which these plans should adhere (See Appendix 5.5 for a visual representation of landscaping works to be undertaken).

**Table 7.7 Minimum Actions Required to be Considered by the Post-Intervention Habitat Installation Plan**

| Habitat Parcel | Intervention | Minimum Required Actions | Timescales for Installation |
|---|---|---|---|
| G1&2<br>G3<br>G4 | Enhancement to fairly good condition Grassland-neutral other | - Clear existing sward to ground level, collect and remove clippings<br>- Utilise a chain and tine harrow to remove thatch and break up soil surface (outside of appropriate badger buffers).<br>- Sow native, British provenance wildflower and grass seed (80:20) at rate of 250g/1000m$^2$<br>- Employ a triple mid-level (approx. 200mm) cut (1$^{st}$ cut – April, 2$^{nd}$ cut – July, 3$^{rd}$ cut – Sept) each year, removing the clippings from the site for up to 3 years or until the cover of the sub-optimal species have reduced below 5%<br>- Employ a traditional hay meadow management regime utilising a rotation between a 2-cuts (high-level (300mm) mid-July and Ground-level - mid-Sept) one year followed by a single cut the following year (Ground-level - mid-Sept) leaving clippings in place until decommissioning of installation. | Onsite - Late summer/early autumn - directly after completion of development if possible.<br>If completion is delayed, sowing should take place in the next early spring<br>Offsite – early spring or late summer/early autumn before or after completion of development |

| Habitat Parcel | Intervention | Minimum Required Actions | Timescales for Installation |
|---|---|---|---|
| G5 | Enhancement to moderate condition Grassland-neutral other | - Clear existing sward to ground level, collect and remove clippings<br>- Utilise a chain and tine harrow to remove thatch and break up soil surface (outside of appropriate badger buffers).<br>- Install appropriate geocell style ground protection.<br>- Sow native, British provenance low growing wildflower and grass seed (80:20) at rate of 250g/1000m$^2$<br>- Employ no more than 3-4 low/mid-level (approx. 70mm) cuts (no closer than 6 weeks interval each year (e.g. Easter, Mid-June and Late July – Early August and late October – if absolutely necessary to facilitate parking requirements), removing the clippings<br>- If area is not predicted to be required for parking cut only in Mid-July (approx. 300mm) and Mid-September (ground level) leaving clipping in place.<br>- If area is no longer required for overflow parking employ traditional hay management regime (see above). | Offsite – early spring or late summer/early autumn before or after completion of development |
| W6 | Enhancement of woodland – other, Broadleaved | - Plant appropriate native, British provenance bare-rooted yearling whips at a minimum density of 2000 trees/ha.<br>- Install each whip with protective spiral and cane.<br>- Where possible trees should be planted into the existing ground flora with minimal clearance of this sward/disturbance of the ground. | Offsite - Late autumn before or within the same year as completion of development |
| | Urban Trees | - Plant two appropriate native, pot-grown/container British provenance, feathered maiden trees (minimum of 1.75m height).<br>- Install an appropriate timber guard (approx. 1.5m diameter) around each tree to protect the tree from physical damage from vehicles and people.<br>- Do not stake tree<br>- Clear tall vegetation from the base of the trees at same time as grassland cuts | Offsite – Late Autumn – Early spring before or within the same year as completion of development |

### 7.9.1. Creation of Management Plan

For the achievement of the net biodiversity gain design detailed in this report, it is imperative that a thorough and detailed management plan be constructed. Whilst the management plan should have a degree of flexibility and adaptability to account for some of the unpredictable nature of land management, it should be based on detailed and precise best

practice methods of habitat installation, management and enhancement and have a rigid timescale of minimum expectations under standard conditions that are measurable by a robust (preferably independent) monitoring system to gauge the success of the installation.

The management plan should be constructed by an experienced land manager with appropriate qualifications in conservation management and ecological restoration and should cover the management protocols used, timelines and specific targets for:

- Restoration and enhancement of retained habitats post-construction
- Creation of design habitats
- Accelerated succession of habitats
- Long-term management and enhancement of habitats within PDS
- Recognising habitat/management failure and applying adaptive management protocols.

### 7.9.2. Creation of Monitoring Plan

Monitoring targets should be set by the management plan and agreed with the LPA. Ideally the management and monitoring should be undertaken by different bodies to reduce any operational bias and ensure the expected standards are being met or exceeded. Post-completion of the installation and the outcome design, the monitoring plan will feed back into the adaptive aspect of the management plan to inform its ongoing success.

A yearly audit of modified habitat parcels should be undertaken, in the middle of the summer growth season prior to the grassland being cut, for a minimum of 10 years, at which point several of the habitat parcels will have matured and a good gauge of the success of the installation of the designed habitats will have been gained.

The audit of each parcel should include an appropriate number (at least one per parcel or density 10/ha or 1/1000m$^2$ if larger than 0.1ha or 1000m$^2$) of appropriately sized quadrats (2m x 2m for grassland, 4m x 4m for scrub, 10m x10m for woodland) being setup at fixed point within each habitat parcel. The quality of the habitat should then be assessed against the criteria for the habitat type. For linear features, the whole length should be assessed as a whole against the assessment criteria. During each audit, a photograph should be taken of each quadrat using a high-quality camera from a fixed location to track the progress its development.

If by the end of 10 years, the targets set by the management plan and agreed by the LPA for each habitat parcel have been met consistently, the period between audits should be extended to a period deemed acceptable by the LPA for a further 20 years, unless the land management team changes, when yearly audits will be required for 3 years to ensure the same standards of management are being met. The parcels of habitat will have been deemed to have been successfully achieved when the BNGM Technical Supplement condition criteria have been met for the goal condition prescribed by the design of each habitat has been met.

It is best practice that monitoring of the site must continue for the full 30 years after completion, even after a parcel is deemed to have reached the prescribed condition prior to the target time elapsing.

Table 7.8 Monitoring Criteria

| Habitat Parcel | Total Size ($m^2$) | No of Q | Size of Q (mxm) | Assessment Criteria | Value at Designed Quality Threshold |
|---|---|---|---|---|---|
| 'Good quality' Enhanced/Created other neutral grassland | | | | Sward resembles appearance & composition of species-rich other neutral /Semi-improved grassland | Yes |
| G1&2 | 5430 | 8 | 2x2 | Sward height varied: | |
| | | | | - Area below 7cm | ≥20 |
| | | | | - Area above 7cm | ≥20 |
| | | | | % cover bare earth | 1-5 |
| G4 | 8100 | 5 | 2x2 | % cover bracken | <20 |
| | | | | % cover bramble | <5 |
| | | | | % cover of INNS | 0 |
| | | | | % cover by undesirable sps* and physical damage combined | <5 |
| | | | | Minimum Species per $m^2$ | 9 |
| 'Moderate Quality' Enhanced other neutral grassland | | | | Sward resembles appearance & composition of species-rich other neutral /Semi-improved grassland | Yes |
| G5 | 2921 | 7 | 2x2 | Sward height varied: | |
| | | | | - Area below 7cm | ≥20 |
| | | | | - Area above 7cm | ≥20 |
| | | | | % cover bare earth | 1-5 |
| | | | | % cover bracken | <20 |
| | | | | % cover bramble | <5 |
| | | | | % cover of INNS | 0 |
| | | | | % cover by undesirable sps* and physical damage combined | <5 |
| | | | | Minimum Species per $m^2$ | 9 |
| 'Good quality' Enhanced other broadleaf woodland | | | | | |

| Habitat Parcel | Total Size ($m^2$) | No of Q | Size of Q (mxm) | Assessment Criteria | Value at Designed Quality Threshold |
|---|---|---|---|---|---|
| W6 | 637 | 1 | 10x10 | Age classes present | All 3 |
| | | | | Wild /feral herbivore damage | None |
| | | | | % cover INNS | 0 |
| | | | | No native woody sps | Min. 5 |
| | | | | % Cover of native woody species | >80 |
| | | | | % open space in woodland | 10-20 |
| | | | | Woodland regeneration | All 3 |
| | | | | % tree mortality | <10 |
| | | | | Recognisable ground flora NVC category | Present |
| | | | | Woodland vertical structure | 3+ storeys |
| | | | | Veteran Trees | ≥0 |
| | | | | Standing deadwood present | Yes |
| | | | | Woodland disturbance/nutrient enrichment | None |
| Moderate Quality Urban Trees | | | | Tree is native | Yes |
| | | | | Tree is mature or veteran | Yes |
| | | | | Little to no evidence of adverse impact by human activities | Yes |
| | | | | Tree has >75% of expected canopy for age range/height | Yes |
| | | | | Presence of micro-habitats for bird/mammals/insects | Yes |
| | | | | >20% of tree canopy is oversailing vegetation beneath | Yes |

# 8. LAND TAKE AND ENVIRONMENTAL MANAGEMENT

## 8.1. Development Site Baseline Conditions

The area outlined for development of the GM PV array consists of heavily managed grassland, with an area of brash and scrub hosting planted trees/whips providing feed to the animals within the Park. At the north of the field outlined for development, works have been undertaken to construct the employee offices, stores and parking facilities. This area is restricted to authorised personnel only and is largely screened from those visiting the site as a result of the established woodland and vegetation.

Managed through regular grass cutting and vegetation maintenance, the field is of little habitat and biodiversity value (as set out within the Ecological assessment chapters). Through the adoption of the array, the applicants, in agreement with WMSP, are taking the opportunity to enhance the baseline conditions of the site. Grassland beneath and around the panels will be improved, with suitable seed mix planting sown to attract pollinators to the area.

The generalised soil type at the development site is classed as freely draining, very acid sandy and loamy soils, of very low natural fertility[38]. Topographic surveys undertaken detail how the array site falls to the north, with the highest area of ground along the southeastern fringe of the development boundary.

Encompassing vegetation and trees at the site will be largely unaffected by the development proposed, with the exception of the immature, self-seeded Oak which will be removed to allow the panels to be installed. To mitigate this loss from the site, an appropriate replacement specimen will be plated elsewhere within the wider Safari Park boundary to replace this loss. At the time of writing, the intention of the Park is to simply relocate the Oak tree through appropriate means to avoid its loss within the park environment.

Cabling will be buried along the route indicated on the submitted site plan (Appendix 2.6). The intended route follows the roadway and car parkin area; ground which has already been excavated and altered.

## 8.2. Loss of Land

Proposed at the site to benefit ongoing and future operations within the Park, the array is sought to optimise the existing baseline condition. As such, the type of fixtures selected alongside construction techniques are considered and chosen for their minimal impact and minor ground intrusion.

The development will involve the installation of metal framework anchored into the ground through tree system foundations. These foundations will fix the framing in place with solar PV cells connected, arranged in rows to maximise the sites productivity. Through the adoption of tree system fixtures, no concrete is required which significantly reduces the lasting impact of the installation and minimises environmental effect. Furthermore, such fixtures require much less ground, with a very small footprint, resulting in less loss of grassland and compacted soil.

Cabling will be laid inside ducting buried to approximately 1m below ground level, connecting the array to the electrical kiosk and substation units for use within the facilities onsite.

[38] Soilscapes: http://www.landis.org.uk/soilscapes/ & MagicMap: https://magic.defra.gov.uk/magicmap.aspx

Installed as per the submitted site plans (Appendices 2.3 - 2.4), the panels will be arranged in rows facing southeast. Following the natural contours of the field, no significant movement of soil or site clearance is required to allow the installation phase to commence. By arranging the panels in such a layout, the site area is maximised, allowing ease of access to modules for maintenance and cleaning.

A small quantity of soil will be scraped back and compacted hardcore laid to accommodate the concrete plinth for the substation unit at the southern point of the site. Any soil excavated for this component will be used elsewhere onsite for filling/landscaping.

With the fixture points taking only a very small, contained area of ground, the wider baseline site remains largely unchanged. As the proposed panels sit off the ground on metal framework, conditions below will continue to be laid to grass and maintained by the Park staff. To reduce the overall impact to the soil and land within the development area, land disturbance will be kept to a minimum. Excavation works and land levelling works are unnecessary to deliver this proposal, beyond the burying of cabling, significantly limiting effect.

The development has an operational lifespan of 35 years and is wholly reversible. As such, there will be minimal 'loss' of land for a medium-term period, with no permanent loss or destruction of land. Indeed, it is stressed that the ground beneath and around the panels will be enhanced through the biodiversity net gain measures to be implemented (see BNG report), which will be a significant benefit when compared to its current heavy management of cutting.

## 8.3. Construction Methods

The extent of disturbance onsite will be limited to areas immediately around the array, tree system fixtures and GRP enclosure/substation units. Existing access arrangements will be used throughout the construction phase with no new tracks required to accommodate the development. Each member of the construction team will be subject to an induction of the site prior to works commencing onsite, with guidance given on best practices to adhere to during the build-schedule. Ground disturbance on the whole will be limited. Working corridors will be kept to a minimum to avoid unnecessary impact to habitats and vegetation communities. Given the location of the proposal positioned on managed grassland within the Park, the adoption and enforcement of an appropriately worded Construction Environmental Management Plan (CEMP) throughout the build-phase of works will adequately address any concerns raised over site works and land use.

The choice of foundations presents a minor loss of land with minimal impact to the site, in comparison to heavily engineered concrete foundations commonly used for such proposals. To install the fixtures, hand tools are sufficient with no heavy plant required to deliver this project, minimising ground disturbance.

Existing ground vegetation will be retained where possible, aiding filtration of runoff from the panels. Limited groundworks limits likelihood of contamination of the water environment. Again, appropriate measures, set out within the CEMP will ensure the implementation of best practice measures during the construction phase to negate environmental impacts and restrict pollution pathways.

On completion of the works, a final inspection of the site will be undertaken to ensure the site is clear and any ground reinstated appropriately. Potential impacts from construction and operation of the site can be appropriate managed throughout.

## 8.4. Drainage and Flood Risk

Commercial solar panels can disrupt or alter drainage pathways, for example through the addition of concrete foundations or hardcore tracks throughout the site. The removal of vegetation or earthworks could also affect existing drainage patterns[39] which should be considered with mitigation adopted if necessary.

A review of available records[40] confirms that the area outlined for development is not at risk of flooding from any sources[41] to cause concern. With no risk of flooding and development area below 1ha, no detailed flood assessment is deemed to be necessary.

The array proposed is to be erected on standard frames which are to be supported by tree system fixtures as per Appendix 2.6. The chosen fixture option does not involve the addition of large quantities of concrete or other hardstanding which could significantly alter the run-off rates or drainage at the site, therefore it is not expected that the proposal will impact the current flood risk or drainage at the site. Suspended off the ground by the framework supports, the electrical inverters will be positioned 0.8m from ground level installed underneath the panels, and will be unaffected should the site at any point (though unlikely and unforeseen) become inundated by surface water.

Given the size of the array proposed and the ground conditions at the site there is no requirement to construct additional tracks throughout the array area.

The site is an area of maintained grassland within the grounds of the safari park which will continue to be managed following the commissioning of the array. As such water run-off from the panels will drain to the existing permeable ground beneath the array. Flow rates will largely be unaltered with site topography allowing continued flow to the northern perimeter which will host new tree planting to further improve conditions (see Landscaping Plan for details – Appendix 5.4).

Given the design of array proposed and minor footprint of the switching station unit sought, the development at WMSP will not alter the drainage or flood risk associated with the site to a degree that would require mitigation.

[39] SNH (2016) Large scale solar photovoltaic installations: considering landscape, visual and ecological impacts
[40] Gov.uk, Environment Agency Flood Map for Planning; https://flood-map-for-planning.service.gov.uk/flood-zone-results?easting=380440&northing=275609&location=DY12%201LF&fullName=%20&recipientemail=%20
[41] Flood risk from Rivers or the Sea, Surface Water or Reservoirs

# 9. AMENITY CONSIDERATIONS

## 9.1. Noise and Vibration

Given the nature of the construction process, noise and vibration emissions will be generated during this phase of works. This is a standard issue relating to a construction project. However, it is important to note that for the proposed array, the construction phase is estimated to run for approximately 15 weeks; a short period of time.

The level of noise and vibration will not be significant or prolonged to the detriment of neighbouring properties or receptors.

Potential effects associated with onsite construction noise and vibration can be controlled through best practice methodologies and working conditions[42]. With the construction period anticipated to last approximately 15 weeks, any effects would be temporary and short-term.

Onsite operations during the construction phase which emit audible noise will be restricted, being carried out only between the hours of 08:00 and 19:00 hours, Monday to Friday and again between 08:00 and 13:00 hours on Saturday. To ensure continued amenity, no works will take place onsite on Sundays or Public and Bank Holidays.

Operational noise from the array will be limited, with potential for low level noise from the inverters installed onsite running during day-light hours. Noise emitted from the inverters and equipment installed within the GRP enclosure will be contained to the structure posing no impact to receptors. As a working tourist attraction, with the adventure theme park operating throughout the opening hours of the site, the ambient noise conditions of the area are heavily influenced by onsite activities, alongside roadway traffic.

Given the location of the development and the encompassing land use, the array presented is unlikely to pose a significant noise impact to receptors in the area given their temporary/transient nature combined with the minimal noise output generated. Separation distance combined with vegetation and ambient noise from surrounding activities will render the operational noise unnoticeable/inaudible to those within the wider locale.

Given the short-term nature of the construction period, along with the low-level noise generated from the array during operation, it is determined that noise does not present an unacceptable impact to receptors.

## 9.2. Glint and Glare

Glint is a direct reflection of sunlight, whilst glare is a less intense, continuous source of brightness. As solar panels are designed to absorb sunlight, rather than reflect it, there are low glint and glare risks. Consideration should be given to aircraft safety if a development is located within proximity to an airfield/airport, particularly if 'tracking' panels are proposed[43].

[42] British Standard Institute (2008) Code of practice for noise and vibration control on construction and open sites; BS 5228 (Amendment February 2014)
[43] BRE (2013) Planning guidance for the development of large scale ground mounted solar PV systems

The array proposed utilises fixed axis panels, installed on metal frames at an angle of 20°. Each panel produced is done so with an anti-reflective coating to mitigate the risk of glint and glare. Panel layout as demonstrated on the attached Site Plan (Appendix 2.3), optimises the site with rows facing southeast, following the topography of the field.

Whilst there are residential properties to the northwest of the area outlined for panels, the nearest being Heath Farm at 190m, significant established woodland along the boundary of the Park provides a barrier to the panels. The closest property is Wayside at 180m distance from the array, however this property is to the northeast of the development and will be unaffected by the panels.

Road receptors travelling along the A456, Kidderminster Road will pass by the array located on the northern edge of the Park. Though in close proximity to the panels, receptors will be unaffected and largely unaware of the operational PV array positioned adjacent on open grassland. Dense, established woodland and vegetation encompassing the site along the Park boundary will provide a physical and visual barrier between the roadway and the array sought. This is discussed in detail in section 5.6. Further planting along the boundary, as presented within the Landscape Plan (Appendix 5.4), will strengthen this natural barrier between the roadway and array. Where planting is deciduous, density of planting with trunks and branches will adequately filter views from the roadway limiting open views of the panels.

At 38km from Birmingham Airport, impacts to aviation interests are negligible.

Accounting for these factors, it is not perceived that the array will present a glint and glare risk to receptors within the area.

## 9.3. Recreational Access and Security

As a popular tourist attraction drawing significant numbers of visitors to the local area, public safety is paramount. The site outlined for development is inaccessible by the general public which reduces the potential impact to those individuals unrelated to operations. An existing fence encompasses the Park restricting access from the main roadside (A456) therefore no further fencing requirements are necessary to enhance onsite security.

During the construction phase, warning signs will be placed within the park to raise awareness of ongoing works and to safeguard members of the public. Once commissioned, signs will be raised on the existing fence to warn individuals of the electrical equipment operating within the site.

The array is sought to not only benefit the business but also the wider environment, through the adoption of green renewable energy. It is envisaged that once operational, the Safari Park will use the array as an educational piece, with information boards erected to inform visitors of the development installed. This array will promote the benefits of solar technology, reaching a wide audience of receptors, from those working at the Park to those transient visitors from further afield. Utilising open unused ground within the Park for this array, which can be removed wholly at the end of its operational lifespan, will be a positive addition to the District.

# 10. TRANSPORT STATEMENT

## 10.1. Introduction

This section addresses the access arrangements and logistical aspects associated with the installation of the PV array at WMSP. Impact to the local road network is considered, along with any increased traffic numbers and any proposed mitigation measures to the adopted into design.

Whilst it is difficult to confirm the route of delivery vehicles at this stage with certainty (i.e. point of dispatch of components unknown), an indication of vehicle numbers and sizes is provided based on alike developments and manufacturer specifications.

As is standard practice, delivery details and timings can be confirmed with the Local Planning Authority, for acceptance of the Highways and Roads Department pre-commencement onsite in accordance with any planning condition issued.

## 10.2. Proposed Development

All components associated with the development sought as per submitted detailed plans (Appendices 2.3-4) will be delivered to the site via the existing road network. As such, traffic numbers will be highest during the construction period, though once operational the development will not generate high numbers of vehicular movements. The development includes the installation of the PV modules on arrays, associated inverters, substation unit, electrical GRP kiosk and buried cabling.

Within the Screening Opinion issued, the Highway Authority requested that a Transport Statement be submitted as part of the planning application. This should provide details specifically on the delivery routes and associated movements of Heavy Goods Vehicles (HGV) during the installation phase of works. Confirmation was also sought on the cable route within the site, with no works required in the highway. These details are discussed within this chapter.

## 10.3. Proposed Route

Given the unknown dispatch points of the components associated with the development sought, it is not possible at this stage to confirm with exact detail the route for delivery. It is however possible to provide an indicative route to the site utilising the surrounding major road network and local infrastructure.

As a large-scale operational Safari Park, the site regularly accepts the delivery of equipment and materials, with all vehicles reliant upon the existing local road network. Given the Parks location on the fringe of Kidderminster, to the southwest of Birmingham, it is anticipated that the main route for vehicles will be from the M5 corridor to the east. Therefore, vehicles will most likely approach the Park entrance from the east, traveling along the A456 Bewdley Hill/Kidderminster Road.

The wider routing of vehicles from the M5 is to be confirmed, however may consist of the following:

*Travelling northbound*:

- Exit at Junction 4 Lydiate Ash Interchange, joining the A941 Sandy Lane travelling northeast.
- At the roundabout, taking the second exit to continue along the A491 Stourbridge Road.

- At the next roundabout on the edge of Hagley/West Hagley, vehicles exit at the second slip to join the A456 Kidderminster Road.
- Follow this roadway through Blakedown before reaching Kidderminster.
- At the Worcester Cross Ringway, continue along the A456 (third exit), and again at the St Marys Ringway roundabout, following signposts to the Safari Park.
- Continue over the next roundabout, exiting at the second exit onto Bewdley Road.
- Continue along A456, Bewdley Road – Bewdley Hill – Kidderminster Road, before exiting into the Safari Park via the main entrance.

*Travelling southbound*:

- Exit at Junction 3 Quinton Interchange, leaving at the third exit joining the A456 Manor Way.
- Continue along the A456 Manor Way, crossing over each roundabout to stay on the A456.
- Follow the same route as previously detailed, travelling along the A456 before entering the Safari Park at the main entrance.

Confirmation of the route will be made prior to onsite construction works.

## 10.4. Site Access Arrangements

With no suitable alternative access route available into the Park, all components associated with this development will be delivered to the site via the local road network, entering the Safari Park via the main access point off the A456. To minimise increased vehicle numbers and interaction between project-related vehicles and visitors to the Park, peak opening and closing times will be avoided where possible and deliveries staggered. Whilst the best-case scenario would be for all delivery vehicles associated with the development sought to access the site only when the wider Safari Park is closed, this is not a feasible option given opening hours and construction schedule. Avoidance of peak periods and appropriate scheduling will minimise impacts as much as possible.

As per Appendix 10.1, two routes within the Park are outlined for vehicles associated with the solar array installation. With all vehicles accessing via the main junction from Kidderminster Road, the primary access route would navigate vehicles through the car park via a locked gate which would only be available for use by construction personnel. To ensure no unauthorised access via this gateway, measures could be put in place to restrict entry, such as being manned during scheduled delivery times and/or the addition of a coded lock with only those relating to the development aware of the code.

The alternative route will divert vehicles via the service corridor, which directs visitors entering the Park for the Safari Lodges. Following this roadway, vehicles will navigate the route towards the main car parking area before heading towards the construction area.

Utilising the existing entry point into the site ensures no upgrading works are required, with infrastructure being of sufficient dimensions, construction and condition. Further arrangements to gain entry to the site are unnecessary beyond signage to raise awareness of construction being undertaken within the site. Internal tracks throughout the Safari Park are maintained to a good standard given their importance to service the site and its inhabitants. As such, no upgrading works or the construction of additional tracks are necessary to deliver the proposed development.

The Park is open 10:00hrs to 16:00hrs for public entry. With all construction vehicles relying upon the main access, sharing this route with the general public will be managed as much as possible to minimise impact.

## 10.5. Vehicle Specifications

### 10.5.1. Construction Vehicles and Scheduling

As with all construction projects, there are a variety of vehicles required onsite at stages throughout the programme. Indicative vehicle specifications and numbers are provided for review, based on similar construction projects. Whilst development consists of a ground-mounted array with buried cabling, the typology of panel fixtures and installation methods relies on hand-operated equipment, significantly reducing the number and size of vehicles required onsite.

**Table 10.1 Vehicles Required for Delivery of Components**

| Vehicle Specifications | Activity/Component | Frequency |
|---|---|---|
| Articulated HGV Lorry | Solar Panel Delivery | Approx. 30 movements to the site, scheduled within first 3 weeks of works |
| | Framework and Fixtures Delivery | |
| | Electrical Kiosk (GRP unit) | |
| Loadall | Various Activities | Daily, throughout construction programme |
| Digger | Excavation of cable route | *Dependent on ground conditions along cable run – anticipated to be transported to site, remaining for 2-3 weeks* |
| Standard Vans | Personnel | Daily, throughout construction programme |

Traffic generation has been estimated based on similar renewable construction projects. Construction personnel will generally travel to site in private vehicles/vans, upon arrival parking within the construction compound to the front of the development site. Where works are impacted by unscheduled interruptions such as weather conditions, works may exceed the noted timeframes to ensure the task is completed.

As detailed, delivery vehicles will be scheduled to ensure minimal impact to the local and wider road network. In terms of numbers of vehicles, at this stage an estimation based on the scale of installation proposed would be around 30 HGV movements to the site[44] with regular trips by light goods vehicles such as cars and vans. Panels are usually packaged onto pallets, usually delivered on 40T articulated goods vehicles. All inverters will be delivered to the site via HGV, along with the mounting systems and electrical equipment. The electrical kiosk will likely be delivered to the site as a single unit on a HGV.

It is anticipated that deliveries of components will be scheduled to allow works to commence onsite rapidly, with only personnel vehicles required throughout the duration of the build-programme. By setting down the components within the Construction Staging Areas at an early stage, vehicles accessing and leaving the site will largely be limited to small-medium vans. By securely storing components at the property, the build schedule is able to progress safeguarded from delayed deliveries. To minimise impact to roadway receptors, any HGVs required as part of the project will be scheduled outwith peak hours (ideally prior to park opening and after park closing).

[44] Accounting for panels, mounting systems, inverters, GRP enclosure and civils

### 10.5.2. Operational Vehicles

Once commissioned, the array will operate with minimal intervention. Very low numbers of vehicle movements will be required throughout the operational phase of the development. Regular cleaning of the panels will be undertaken to optimise their efficiency, requiring maintenance personnel attending the Park monthly/bimonthly, travelling by standard vans, remaining onsite for the duration of the day.

Furthermore, the panels and electrical equipment will undergo annual services to ensure all components are in optimal working order. Again, engineers will attend the site in standard vans, likely entering and remaining onsite for the day.

### 10.5.3. Vehicle Allowances

The dimensions and weights of vehicles used on British roads are regulated by the Road Vehicles (Construction & Use) Regulations 1986 (C&U) and the Road Vehicles (Authorised Weight) Regulations 1998 (AW). Special types of vehicles are those which don't meet the C&U and AW Regs but can be used outside of these rules under the authority of the Road Vehicles (Authorisation of Special Types) (General) Order 2003 (STGO). Vehicles which do not comply with an STGO can be used on the road if Special Orders have been issued. The general allowances for vehicle length, width and weight using the public road network are outlined in Table 10.2.

**Table 10.2 Vehicle Allowances on Public Highway[45]**

| Classification | Width (m) | Rigid Length (m) | Weight (T) | Notifications |
|---|---|---|---|---|
| Abnormal Load – Special Types General Order | >2.9- ≤6.1 | >18.65 - ≤30 | >44 - ≤80 | 2 days' notice to Police |
| | | | >80 - ≤150 | Plus 5 days' notice with signed indemnity to Highway & Bridge Authorities |
| Abnormal Load – Special Order | >6.1 | >30 | >150 | 5 days' notice to Police and Secretary of State 'Special Order' |

Given the scale and nature of development proposed at WMSP, it is foreseen that all vehicles associated with the construction phase will be standard load HGV's. As such, no abnormal loads are proposed with no special order permits or escorts required. Should this situation change, adequate timing will be afforded to gain the required permits/orders prior to works commencing onsite.

## 10.6. Construction Period

The scale of development proposed is considered a medium-scale installation with a relatively short construction programme. It is anticipated that the array and electrical components could be constructed at the site over a period of 15 weeks. Delivery of all components required for the installation will likely be scheduled to be delivered in the first few weeks, with equipment being stored securely onsite for installation over the following period. As detailed on the submitted Site Plans (see Appendices 2.3 and 2.4), two Construction Staging Areas are to be allocated onsite; one at the northwesternmost edge of the development field and the second along the access road. Positioned adjacent to the office building, the northern staging area will be a secure area for storage of components throughout the build-stage. The

[45] Highways England, Aide Memoire for notification requirements for the movement of Abnormal Indivisible Loads or vehicles by road when not complying with The Road Vehicles (Construction and Use) Regulations 1986 (commonly known as C & U)

secondary staging area will be used only when onsite working is underway; there will be no storage of equipment or components in this open area.

### 10.6.1. Construction Phases

The construction of the proposed development will take place in phases to ensure safety of personnel and the public, set out in the following sequence:

*Site Preparation*

- Site preparation and laying out.
- Vegetation clearance/management, where necessary.

*Solar Array Construction*

- Erection of metal framework, with tree system fixtures installed by hand.
- Lifting and securing of panels onto framework.
- Cabling and inverters connected.

*Cabling*

- Set out of cable route.
- Excavation of route along internal roadway from array to existing substation within the Park.
- Hand-dig areas excavated where required to minimise impact.
- Laying of cabling and reinstatement of site.

## 10.7. Expected Timetable

Timescales relating to the delivery of components will be confirmed by the Project Manager post-consent, prior to commencement of development. Any delays to timescales outwith the control of the Applicant or Contractor will be verbalised to the Local Authorities Roads Department when known. Stages will run concurrently where possible to minimise overall timescales.

**Table 10.3 Indicative Timetable**

| Stage | Duration |
|---|---|
| Site Preparation | 2 weeks |
| Component Delivery | 3 weeks |
| Array & Cabling Installation | 10 weeks |
| Electrical Commissioning | 1 week |
| Site Reinstatement and Clearance (following complete commissioning and handover of array) | 1 week |

## 10.8. Onsite Working Times

In line with noise and vibration conditions, onsite workings relating to the array and cabling will be limited to ensure amenity is maintained throughout the area. As noted previously, operations within the Park include the Adventure Theme Park and Safari Drive-thru which contribute towards the ambient noise conditions of the area.

Onsite construction works which emit audible noise will be restricted, being carried out only:

- Between 08:00 and 19:00 hours, Monday to Friday
- Between 08:00 and 13:00 hours on Saturday

To ensure continued amenity, no works will take place onsite on Sundays or Public and Bank Holidays.

In terms of delivery vehicles, there will be a working schedule to avoid peak periods at the Park, where possible. Delivery vehicles will be scheduled to allow for onsite access to and from the site between the hours of:

- Monday – Friday: 08:00 – 09:45, 16:00 – 19:00
- Saturday: 08:00 – 09:45

No goods vehicles will be scheduled for access onsite on Sundays.

## 10.9. Decommissioning

The decommissioning of the array at the end of its life will follow a reversed construction process. The levels of traffic associated with decommissioning are likely to be lower than those for construction, occurring over a shorter timeframe.

It is common practice to attach a condition to planning permission requiring the submission and acceptance of a Decommissioning and Restoration Plan (DRP) prior to the expiry of consent. Details of vehicle requirements, numbers and timings will be presented within the DRP submitted prior to project removal. Reinstatement of the site will involve the removal of all components above ground and ensuring the area is returned to pre-developed state. Minimal impact will be posed to receptors along the route during this phase of works.

## 10.10. Potential Impact and Mitigation

As a large operational Safari Park, access arrangements to, and throughout the site are of high construction specifications and maintained to a good quality. Vehicles associated with the delivery and construction of the array development will be of similar scale and type to those on the local network, relying on the route. No upgrading works are therefore anticipated.

Potential impact will arise from the increased numbers of vehicles accessing the Safari Park from the main roadway off Kidderminster Road. This will be managed as much as possible through the scheduling of vehicles as previous discussed, alongside the erection of signage for construction personnel. The implementation of a Traffic Management Plan (TMP) is a recognised and widely used method of ensuring impacts relating to the transportation and delivery of a development are minimised to the greatest extent possible. A draft TMP is provided as Appendix 10.2 for consideration, with a formal revision available prior to commencement onsite in compliance with a condition attached to the consent issued (if necessary).

To further minimise impact to those residing in the local area, residents will be notified of the programme of works by the Project Manager prior to commencement, if deemed necessary. All deliveries to the Park will be scheduled and as such, it is possible to confirm the movement of HGV's associated with the construction phase and communicate to residents

surrounding the Park[46] (and the Authority). By notifying residents of works undertaken onsite, the aim is to minimise potential disruption as much as possible.

Additional mitigation measures to be implemented as part of the construction stage to minimise environmental impacts are outlined in Table 10.4. Driver safety is of paramount consideration with measures taken to ensure no impact is posed to road users. Whilst increased levels of traffic will be experience on the local road network, the levels expected will not be significant or to the detriment of receptors.

**Table 10.4 Mitigation Measures**

| Concern | Mitigation Measures |
|---|---|
| Noise during construction | Delivery times will be scheduled to avoid peak periods at opening and closing times at the Safari Park:<br>- Monday – Friday: 08:00 – 09:45, 16:00 – 19:00<br>- Saturday: 08:00 – 09:45<br>Working times will be scheduled within standard working hours:<br>- Monday – Friday: 08:00 and 19:00<br>- Saturday: 08:00 and 13:00<br>- Sunday: no work (TBC) |
| Road Safety | If deemed necessary, appropriate warning signs notifying road users of the construction onsite will be placed at the entrance to WMSP at Kidderminster Road.<br>All vehicles will adhere to the existing speed limits and rules of the road.<br>All deliveries to the site will be scheduled, with all drivers and personnel associated with the development issued with a copy for reference. |
| Neighbour Notification | Local residents within 0.5km of the Park's entrance notified of scheduled works along the roadway prior to commencement onsite to minimise disruption. |
| Air Quality | The contractor will ensure that the numbers of vehicles used for the construction of the development are kept to a minimum.<br>Vehicle idling will be discouraged with all drivers aware as part of the scheduling report. |

[46] Residential properties within 0.5km of the park entrance