Botley West Solar Farm

Scoping Report

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EXECUTIVE SUMMARY

Photovolt Development Partners GmbH (PVDP), on behalf of SolarFive Ltd. (the Applicant), is proposing to build and operate a new ground mounted solar farm in Oxfordshire. The development site (the Site) has a total area of approximately 1400 hectares (ha) and is located within parts of the administrative areas of Cherwell, West Oxfordshire and The Vale of White Horse Districts. The development project (the Project) is called Botley West Solar Farm (BWSF), named after the proposed grid connection location.

PVDP is a Berlin-based developer of solar farms and has been building solar assets in Europe and Japan for the last 18 years, with 1.0GW built to date. SolarFive Ltd. is a 'special purpose vehicle' (SPV) that has been granted a licence by Ofgem to generate electricity and offered a grid connection by National Grid Electricity Transmission.

BWSF is formed of three separate but related solar farm areas, with interconnecting cables, which together would generate renewable power through photovoltaic (PV) panels. The Project aims to deliver approximately 840MWe of power to the National Electricity Transmission System (NETS), providing secure and clean energy of an equivalent level to meet the needs of approximately 330,000 homes.

This Environmental Impact Assessment (EIA) Scoping Report has been prepared by RPS on behalf of PVDP, to formally request an EIA Scoping Opinion for the installation of the PV generating panels and associated infrastructure required for its operation and construction.

As the development will generate over 50MW it is recognised as a Nationally Significant Infrastructure Project (NSIP), and therefore requires a Development Consent Order (DCO) under the Planning Act 2008.

This Scoping Report has been prepared in accordance with Regulation 10(1) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended, hereafter referred to as the 'EIA Regulations'. In line with the requirements of 10(3) of the EIA Regulations, this request contains the following information to assist the Planning Inspectorate (PINS), as the relevant authority, in adopting a Scoping Opinion:

- A plan sufficient to identify the land;
- A description of the proposed development, including its location and technical capacity;
- An explanation of the likely significant effects of the development on the environment; and
- Such other information or representations as the person making the request may wish to provide or make.

This Scoping Report has been prepared to provide an overview of the likely significant environmental effects that have been considered in scoping the EIA for the Project. It sets out the intended scope and the methodologies for assessments of the likely significant environmental effects to be reported in the Environmental Statement (ES), which will accompany the application for development consent. The Scoping Report also provides the justification and rationale for scoping out environmental topics or receptors where it is considered that significant effects are unlikely to arise as a result of the Project.

The EIA Scoping Request has been prepared with reference to PINS Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements, which contains guidance on EIA Scoping.

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Glossary

Term	Definition
AADT	Annual Average Daily Traffic
AC	Alternating Current
AIL	Abnormal Indivisible Load
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
AQO	Air Quality Objective
AQMA	Air Quality Management Area
ATC	Automatic Traffic Count
AURN	Automatic Urban and Rural Network
BAP	Biodiversity Action Plan
BGS	British Geological Survey
BM	Balancing Mechanism
BETTA	British Electricity Trading and Transmission Arrangements
BPM	Best Practicable Means
BS	Balancing Settlement Code
BSUoS Charges	Balancing and Use of System Charges
BTO	British Trust for Ornithology
BWSF	Botley West Solar Farm (the Project)
CBS	Cement Bonded Sand
CCTV	Closed-circuit Television
CDM	Construction Design and Management
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
CFMP	Catchment Flood Management Plan
CHSR	Conservation of Habitats and Species Regulations
CIEEM	Chartered Institute for Ecology and Environmental Management
CO2	Carbon Dioxide
CoCP	Code of Construction Practice
CRoW	Countryside and Rights of Way Act
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
CWS	County Wildlife Site
CoCP	Code of Construction Practice
CS	Cancellation Charge
CBA	Customer Build Agreement
CDC	Cherwell District Council
CEC	Connection Entry Capacity
CfD	Contracts for Difference
CION	Connection and Infrastructure Options Note
CUSC	Connection and Use of System Code
Defra	Department for Environment Food and Rural Affairs

Term	Definition
DESNZ	Department for Energy Security and Net Zero
DfT	Department for Transport
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DC	Direct current
DCO	Development Consent Order
DNO	Distribution Network Operator
DUKES	Digest of UK Energy Statistics
EA	Environment Agency
EcIA	Ecology Impact Assessment
EIA	Environmental Impact Assessment
EMF	Electric and Magnetic Fields
EPA	Environmental Protection Act
EPS	European Protected Species
ESO	Electricity System Operator
ES	Environmental Statement
FID	Final Investment Decision
FRA	Flood Risk Assessment
FTE	Full Time Equivalent
GC	Grid Code
GCN	Great Crested Newt
GCP	Grid Connection Point
GHG	Greenhouse Gas
GI	Green Infrastructure
GIS	Gas-insulated high-voltage switchgear
GPDO	General Permitted Development Order
GSP	Grid Supply Point
GVA	Gross Value Added
Ha	Hectare
HDD	Horizontal Directional Drilling
HDV	Heavy Duty Vehicle
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HLC	Historic Landscape Characterisation
HMSO	Her Majesty's Stationary Office
HPI	Habitats of Principal Importance
HR	Hedgerows Regulations
HSI	Habitat Suitability Index
HRA	Habitats Regulations Assessment
HV	High Voltage
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current

Term	Definition
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment
JNCC	Joint Nature Conservation Committee
kV	Kilovolt
LAQM.TG	Local Air Quality Management Technical Guidance
LDV	Light Duty Vehicle
LGV	Light Goods Vehicle
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LVIA	Landscape and Visual Impact Assessment
MAGIC	Multi-Agency Geographic Information for the Countryside
MAFF	Ministry of Agriculture Fisheries and Food
m bgl	Metres Below Ground Level
MD	Moisture Deficit
MfS	Manual for Streets
MV	Middle Voltage
MWe	Megawatt Electric
MWh	Megawatt hour
MWp	Megawatt peak
NERC	Natural Environment and Rural Communities Act
NETS	National Electricity Transmission System
NGET	National Grid Electricity Transmission plc
NIC	National Infrastructure Commission
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NSR	Noise Sensitive Receptor
OCC	Oxfordshire County Council
Ofgem	Office of Gas and Electricity Markets
OHL	Overhead Line
OS	Ordnance Survey
Oxon	Oxfordshire
PAH	Polycyclic Aromatic Hydrocarbons
PBA	Protection of Badgers Act
PCS	Power Converter Station
PM10	Particulate Matter
PPG	Planning Practice Guidance
PRoW	Public Right of Way
RSPB	Royal Society for the Protection of Birds
PINS	The Planning Inspectorate
Project	The development project – known as Botley West Solar Farm

Term	Definition
PV	Photovoltaic
PVDP	Photovolt Development Partners GmbH (acting for the Applicant)
SAC	Special Area of Conservation
SFRA	Strategic Flood Risk Assessment
Site	The boundary of the Project installation as shown on Figure 1
SoCC	Statement of Community Consultation
SolarFive Ltd.	The Applicant and Energy Generation Licence Holder
SPA	Special Protection Area
SPV	Special Purpose Vehicle
SPZ	Groundwater Source Protection Zone
SSSI	Site of special scientific interest
SQSS	Security and Quality of Supply Standards
SuDS	Sustainable Urban Drainage
SWMP	Surface Water Management Plan
TCPA	Town and Country Planning Act 1990
TEC	Transmission Entry Capacity
TNUoS Charges	Transmission Network Use of System Charges
TPH	Total Petroleum Hydrocarbons
TO	Transmission Owner
UK BAP	United Kingdom Biodiversity Action Plan
UWS	Unconfirmed Wildlife Site
UXO	Unexploded Ordnance
V	Volt
VWHDC	Vale of White Horse District Council
WCA	Wildlife and Countryside Act
WFD	Water Framework Directive
WSI	Written Scheme of Investigation
WODC	West Oxfordshire District Council
ZTV	Zone of Theoretical Visibility

1 INTRODUCTION

1.1 Background

1.1.1 This Scoping Report has been prepared by RPS on behalf of Photovolt Development Partners GmbH (PVDP) for the Applicant, SolarFive Ltd. (SolarFive). SolarFive is a licence holder under the Electricity Act 1989. SolarFive is also a company registered in England and Wales (company no. 12602740).

1.1.2 This Scoping Report proposes the scope of environmental assessment for proposals to install and operate up to 840MWe of solar generation in parts of West Oxfordshire, Cherwell and Vale of White Horse Districts (the Project).

1.1.3 SolarFive proposes to submit an application for development consent to the Planning Inspectorate (PINS) under the Planning Act 2008. The application will be accompanied by an Environmental Statement (ES) prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended (the EIA Regulations), and other required documents including a statement on pre-application consultation.

1.1.4 This Scoping Report sets out the proposed content, methodologies and key issues to be included within the Environmental Impact Assessment (EIA) process and the resulting ES to be submitted with the application. The purpose of this document is to obtain a Scoping Opinion from PINS (on behalf of the Secretary of State).

1.2 Site Location

1.2.1 The Botley West Solar Farm (BWSF) Project will be located in the county of Oxfordshire, across an area of approximately 1,400 ha. The Project extends from an area of land in the north, situated between the A4260 and the Dorn River Valley near Tackley and Wootton, through a central section, situated broadly between Bladon and Cassington, and connecting to a section further south near to Farmoor Reservoir and north of Cumnor, where the Project will connect to the National Grid transmission network. The name 'Botley West' is derived from the location of the grid connection point.

1.2.2 The Project lies within the administrative areas of Cherwell (CDC), West Oxfordshire (WODC) and Vale of White Horse (VWHDC) District Councils, and Oxfordshire County Council (OCC). The majority of the Project lies within West Oxfordshire.

1.3 Overview of the Project

1.3.1 The UK Government has legislated to commit the country to achieving net zero carbon emissions by 2050, and to de-carbonising electricity by 2035. These commitments mean the country urgently needs more renewable forms of electricity to be produced. The reliance on fossil fuels as part of the UK's energy mix will have to be displaced by cleaner and more secure sources of energy, resulting in greatly increased renewable electricity demand. Already, many conventional gas-fired power stations have closed and many of the older nuclear power stations will no longer be generating to support the nation's energy needs. BWSF's generation output will be vitally important if the Government's commitments are to succeed, significantly helping to deliver the transition to net zero.

1.3.2 As the generation capacity of Project will be up to 840MWe, it is classified as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008. This means a Development Consent Order (DCO), from the Secretary of State for Energy Security and Net Zero (DESNZ), will be required before the Project can proceed. PVDP is preparing such an application and after further design, consultation and assessment, they aim to submit an application for consent in early 2024.

1.3.3 The Applicant will ensure that the local community and key stakeholders are informed about and consulted upon the proposals to construct, operate and decommission the Project, prior to an application for development consent being made to the Secretary of State. A formal programme of consultation has been discussed, and a draft Statement of Community Consultation (SoCC) is to be agreed with the relevant host authorities. The Applicant also completed a first phase of informal consultation during November and December 2022.

1.3.4 The Blenheim Estate is the main landowner for the Project. PVDP intends to lease the land from Blenheim Estate alongside other supportive landowners in the local area. This is a common arrangement when developing solar farms in the UK.

1.3.5 The majority of the land proposed for the Project is currently used for arable crops or is otherwise down to pasture. The consent being sought by the Project is a temporary consent for 42 years from the date of any DCO consent granted for the Project. At the end of this period all above ground infrastructure (excluding the National Grid Electricity Transmission (NGET) substation) and equipment will be removed with the land reverting back to its previous use at the end of that period.

1.3.6 The Project's solar arrays (comprising all the mounting structures, frames and foundations) will be connected by underground electrical cables within each section of the site, and via underground electric cable to the substation at the grid connection point. The interconnecting cable route will largely follow the public highway, but some parts will cross land controlled by the Applicant.

1.3.7 The Project will connect to a new National Grid Electricity Transmission (NGET) system, via a new National Grid 400kV substation, to be located close to the existing National Grid 400kV line that runs between Cowley and Walham. Discussions have been ongoing with NGET regarding the location for their substation based upon their own assessment and evaluation work. Whilst, at the time of writing this report, a final decision has yet to be taken by NGET, it is likely that the NGET substation will be located in one of two possible locations:

1. On land within the Applicant's control, at its Southern Site, at the western most extremity, south of the Farmoor Reservoir.

2. On land near the Applicant's Southern Site, to the west of that site, south of the Farmoor Reservoir.

1.3.8 For Scoping purposes, the Applicant assumes that the NGET substation will be within the Applicant's site, as described in Option 1 above, and powers will be taken to consent that substation as part of the Applicant's DCO. If NGET decides not to locate their substation within the Applicant's site, then PVDP will assess:

(a) an alternative location, assumed to be close to the Southern Site at its western end, on a cumulative basis, with NGET seeking consent via the Town and Country Planning Act route; and

(b) the substitution of solar panels for the substation on the land referred to in Option 1 above.

1.3.9 The area to be set aside for the NGET substation amounts to approximately 3.8 ha. Within that area it is assumed that the substation itself will occupy a footprint of approximately 165m by 135m, with a maximum height of 15m, excluding connecting tower structures.

1.4 The Applicant

1.4.1 The Applicant, SolarFive, is the 'special purpose vehicle' (SPV) for the Project and has been awarded a generation licence by Ofgem and offered a grid connection by National Grid Electricity Transmission (NGET) from October 2026. SolarFive is a company registered in the UK (company no, 12602740) and is a licence holder under the Electricity Act 1989.

1.4.2 As a licence holder, SolarFive will adhere to its duties under Schedule 9 of the Electricity Act 1989 to protect the environment. As part of the due process required to support the proposals, the Applicant will produce a separate Schedule 9 Statement, which will describe how it will carry out its duties with 'regard to the preservation of amenity'.

1.4.3 PVDP will act on behalf of SolarFive, and in liaison with its technical consultant team, will prepare and submit the DCO application.

1.4.4 SolarFive is jointly owned by the two founders of PVDP GmbH, a Berlin-based developer of solar farms. PVDP GmbH has been successfully developing solar assets in Europe and Japan for the last 18 years, with 1.0GW built to date.

1.5 Consenting Regime

1.5.1 The Planning Act 2008, as amended, defines Nationally Significant Infrastructure Projects (NSIPs). Part 3, paragraph 14(1) and 15(2) of the Act describes the construction of a generating station exceeding 50MWe (that isn't onshore wind) as an NSIP. The Applicants Project therefore is a NSIP.

1.5.2 National Policy Statements (NPS) are designated under the Planning Act 2008 and set out the Government's policy for the delivery of energy infrastructure providing the legal framework for planning decisions. The current extant suite of NPS were published in 2011.

1.5.3 In November 2020, the National Infrastructure Strategy established a National Infrastructure Planning Reform Programme, to make the NSIP system more effective. A 'call for evidence' process began in November 2021 with the commencement of the Government consultation *Draft National Policy Statements – Planning for new energy infrastructure.* This ran between the 6th of September and the 29th of November 2021, with the draft NPS also being the subject or parliamentary scrutiny between the 6th September 2021 and the 28th February 2022.

1.5.4 Government published a response to the 2021 consultation, which resulted in the strengthening of the NPS in line with the British Energy Security Strategy. A second consultation on the documents, entitled "*Nationally Significant Infrastructure: action plan*

for reforms to the planning process" was published on 23rd February 2023 and closed on the 25th of May 2023.

1.5.5 The energy NPS subject to consultation comprised the overarching NPS for energy (EN-1) alongside technology-specific NPS (EN-2 to EN-5):

- Draft EN-1: Overarching NPS
- Draft EN-2: Fossil fuel electricity generating infrastructure
- Draft EN-3: Renewable Energy infrastructure
- Draft EN-4: Gas supply infrastructure & gas and oil pipelines
- Draft EN-5: Electricity Networks Infrastructure

1.5.6 EN-1 sets out the 'need case' for energy infrastructure projects, and planning guidance on assessment criteria that are common across a number of technologies. EN-2 to EN- 5 refer to the need case in EN-1 and include planning guidance on the assessment of technology specific criteria.

1.5.7 The revisions proposed to draft EN-3 Renewable energy infrastructure emphasise the central role that solar will play in decarbonising the energy sector. The scale of such proposals and their impacts are also recognised.

1.5.8 The transitional provisions in the draft EN-1 state that the suite of NPS will only have effect once designated in relation to those applications that are accepted for examination after the date of designation. The potential date for submission of the BWSF application may mean that there is no NPS specifically in relation to ground mounted solar, but in our opinion the draft NPS are important and relevant, as defined in S.105 (2)(c) of the 2008 Act, and are matters which the Secretary of State should have regard to and place significant weight on, given that they are consistent with the British Energy Security Strategy and reflect the Government's latest energy related policy.

1.5.9 As explained in paragraph 1.1.15, it is currently assumed that the NGET substation and connections to the existing 400kV OHL will be consented within the Applicant's DCO. If, however, NGET decide to select a different location, outside the Applicant's site boundary, then NGET is likely to secure a consent separately under the Town and Country Planning Act 1990.

1.6 Environmental Impact Assessment

1.6.1 EIA is the process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and likely future baseline conditions.

1.6.2 The legislative framework for EIA is set by European Directive 2011/92/EU and amended by Directive 2014/52/EU (collectively referred to as the EIA Directive). The EIA Directive requires EIA to be completed as part of an application for development consent for certain types of projects. For projects of this type in England, the European legislative requirements are transposed into law by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended.

1.6.3 EIA is not required for all developments of this type. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations), as amended, set out the requirements for EIA for NSIPs. The Project would fall under Schedule 2, Part 3(a) relating to generation of energy (industrial installations for the production of electricity, steam and hot water).

1.6.4 Schedule 2 development requires EIA to be undertaken where it is likely to have significant effects on the environment by virtue of factors such as its nature, size or location. Taking into account the nature and scale of the development proposed, EIA will be undertaken for the Project.

1.7 Scoping

1.7.1 The process of identifying the issues to consider within an ES (establishing the scope of the assessment) is known as scoping. Scoping is not a mandatory requirement under the EIA Regulations. However, it is recognised as a useful part of the assessment process which helps to identify the main effects that a project is likely to have on the environment.

1.7.2 The scoping of EIA by which these main or significant effects are identified is, therefore, an important preliminary procedure, which sets the context for the study. Through the scoping exercise, the key environmental issues are identified at an early stage, which permits subsequent work to concentrate on those environmental topics for which significant effects may arise as a result of a proposed development.

1.8 Purpose of this Scoping Report

1.8.1 Under Regulation 8 (1) (b) of the EIA Regulations, the Applicant proposes to provide an Environmental Statement in respect of this development.

1.8.2 This Scoping Report describes the scope and methodology of the technical studies being undertaken to provide a comprehensive assessment of any likely significant effects and, where necessary, to determine suitable mitigation measures for the construction and operational phases of the Project. It also describes those topics which are proposed to be scoped out of the EIA process and provides justification as to why these effects would not have the potential to result in significant environmental effects.

1.8.3 The content of the Scoping Report aims to inform and facilitate the request to PINS, on behalf of the Secretary of State, to issue a Scoping Opinion, as set out in Regulation 10 (1) of the EIA Regulations.

1.8.4 A Scoping Opinion must be adopted within 42 days of receiving a Scoping request. That request is set out in the form of this Scoping Report, in accordance with Regulation 10(6) of the EIA Regulations.

1.9 Structure of this Report

1.9.1 This Scoping Report is structured as follows:

- Chapter 1: Introduction;
- Chapter 2: Existing Baseline;
- Chapter 3: Consenting and Consultation Process;

- Chapter 4: Approach to EIA;
- Chapter 5: Need and Alternatives Considered;
- Chapter 6: Project Description;
- Chapter 7: Proposed Scope of Assessment: ES Chapters;
- Chapter 8: Proposed Scope of Assessment: Supporting Technical Assessments;
- Chapter 9: Topics Proposed to be Scoped Out of the EIA Process;
- Chapter 10: Summary Tables – Potential Effects;
- Chapter 11: Mitigation and Monitoring;
- Chapter 12: Structure of the ES; and
- Chapter 13: References.

1.9.2 It should be noted that Chapter 7 covers the scope of topics that would be included as full ES chapters. Chapter 8 covers topics where the scope of works only includes a specific aspect of a topic (such as construction dust) and therefore only a supporting technical assessment is required as part of the ES, and not a full chapter. This is explained further at Chapter 8.

2 EXISTING BASELINE

2.1 Existing Development Site

2.1.1 The Project is divided across three separate parcels of land, to the west and northwest of Oxford, connected by underground electric cables, with a total area of approximately 1400 ha. The proposed area of installed panels (excluding internal roads and support areas) is approximately 959 ha.

2.1.2 For the purposes of this EIA scoping report, the parcels are described in three parts, referred to as the Northern, Central and Southern sites. Figure 1 provides a location plan for the whole Project.

Northern Site (West Oxon and Cherwell)

2.1.3 The Northern Site shown on Figure 1 comprises approximately 316 ha. It is located north of the town of Woodstock, west of Tackley and east of Wootton. The A4260 Banbury Road runs to the east of the site for its entire length, as does the River Dorn to the west. This section is bisected by the B4027 towards the south. The land is arable but low-grade agricultural land (see Figure 4) with multiple farm holdings scattered around the boundary edges.

2.1.4 The site is relatively flat although it rises gently towards the north. The Natural England Regional Agricultural Land Classification Map (London and the South-East, ALC007, 2010) confirms the area as likely to be Grade 3 agricultural land which would require further surveys to ascertain whether it is considered ‘best and most versatile’ (BMV) agricultural land.

2.1.5 A review of Environment Agency (EA) flood mapping confirms that the Northern Site is entirely within Flood Zone 1, which is land with the lowest probability of flooding (see Figure 5).

2.1.6 This site is not covered by or near to any statutory designations (e.g. Green Belt, National Park, AONB). There are no statutory ecological designations on site (SSSI, SPA, RAMSAR, LNR). However, there are three SSSIs and two Nature Reserves close to the site boundary as shown on Figure 5. Sheep’s Banks and Shipton-on-Cherwell & Whitehill Farm Quarries SSSIs are within 1 km of the Northern Site’s boundary.

2.1.7 There are a number of historical designations in close proximity to the Northern Site. Concentrations of listed buildings can be found in Wootton to the west and Tackley to the east. They comprise predominantly Grade II buildings with two examples of Grade II* listings. The site almost encloses a scheduled monument adjacent to the B4027, which is a Roman Villa. Just south of this is another scheduled monument - Rectangular Earthwork, Hensington. Two further scheduled monuments can be found east of the site, the Long Barrow, 730 m south-west of Enslow Bridge approximately 400 m east of the southern tip of the section and the Whitehill Medieval Settlement immediately south of Old Whitehill Farm approximately 2 km north-west of the southern tip of the section.

2.1.8 Blenheim Palace and the associated grounds lies approximately 1 km south of the Northern section, at the nearest point. Blenheim Palace is a Grade I listed House, Park and Garden as well as being a World Heritage Site, and contains several individual Scheduled

Monuments and Grade I and II listed buildings. The northern end of the Northern Site also lies 2 km from Rousham House and Gardens, which is listed Grade I and has a William Kent designed landscape.

2.1.9 There is an extensive public right of way (PROW) network running within and around this site, most prominently the Oxfordshire Way which crosses the section on an east-west bearing. The 416/11/20 bridleway also runs in a north-south bearing through the section for almost its entire length.

2.1.10 The majority of the Northern Site lies within West Oxfordshire District, but with some fields on the eastern edge falling into Cherwell District. None of the Northern Site is within the Green Belt.

Central Site (West Oxon and Cherwell)

2.1.11 The Central Site shown in Figure 1 is west of Kidlington, and comprises approximately 970 ha. The largest of the three sections, it is encircled by the villages of Bladon, Begbroke, Yarnton, Cassington, Freeland, Eynsham and Long Hanborough. Some of these residential areas are adjacent to the site boundary. The A34 runs to the north-east of the site and the A40 to the south. This site is bisected by a railway line and two roads cross the site: Lower Road and Burleigh Road. As with the Northern section, this section is made up of arable farmland. The River Evenlode runs through the site. There are multiple farm buildings within the site boundary.

2.1.12 There are three areas of ancient woodland (see Figure 5) enclosed but not forming part of the site – Burleigh Wood, Bladon Heath and Begbroke Wood.

2.1.13 The site is on undulating land with peaks at Purwell Farm and Begbroke Wood. The Natural England Regional Agricultural Land Classification Map (London and the South East, ALC007, 2010) confirms the area as likely to be Grade 3 agricultural land which would require further surveys to ascertain whether it is considered BMV agricultural land.

2.1.14 A review of Environment Agency (EA) flood mapping confirms that the section is mostly within Flood Zone 1, which is land with the lowest probability of flooding. Where the River Evenlode crosses the section there are areas of Flood Zone 3 (see Figure 3), but it is not proposed to develop solar arrays in these high-risk areas.

2.1.15 This site is not affected by statutory landscape designations such as National Park, AONB, SPA. The Cotswold AONB is, however, less than 1 km to the north-west of the Central Site at its closest point. The large majority of the section lies within the Oxford Green Belt, with only the portion of the site to the west of Lower Road lying outside the Green Belt.

2.1.16 There are no statutory ecological designations on site (SSSI, RAMSAR, LNR). However, there are multiple SSSIs in close proximity as shown on Figure 5. The two areas of woodland enclosed within the site are ancient woodland. Blenheim Park SSSI is adjacent to the north and there are several other SSSIs to the south including Cassington Meadows, Pixey and Yarnton Meads, Wolvercote Meadows, Wytham Woods and Wytham Ditches & Flushes. To the east is the Rushey Meadows SSSI and to the west is the Long Hanborough Gravel Pit SSSI, although it is of an 'Unfavourable Declining' quality.

2.1.17 As with the Northern site, there is a multitude of listed buildings (see Figure 8), predominantly Grade II, surrounding the site. The main concentrations of nearby listed buildings are found in Bladon, Begbroke, Yarnton, Cassington, Eynsham and Church

Hanborough. There also five Grade II listed buildings, which appear to be mainly farm properties, enclosed within the section, albeit not actually within the red line.

2.1.18 Also enclosed within the section is the scheduled Bladon Camp: a hill fort on Bladon Heath, within Worton Heath. As previously mentioned, Blenheim Palace and grounds are in close proximity, and at points adjacent to the Central Site.

2.1.19 Although to a lesser extent than the Northern Site, the Central Site is crossed by a number of PRoWs. The route that would be most impacted being the Shakespeare's Way, which runs through the centre of the site, northwest from Yarnton. The 132/5/10 bridleway and 132/4/10 footpath also cross through the northern part of the section for a relatively long distance.

2.1.20 The large majority of the Central section of the Project lies within West Oxfordshire District, but again some fields on the eastern fringes, nearest to Oxford Airport and Begbroke, lie within Cherwell District.

Southern Site (Vale of White Horse)

2.1.21 The smallest of the three sections, comprising approximately 81 ha, the Southern Site lies south-east of Farmoor Reservoir (see Figure 1). The Oxford suburb of Botley lies to the east, and Cumnor to the south. The A420 passes the section to the east. The section is split by the Cumnor Road and Denman's Lane. There are three separate areas of ancient woodland bordered by this section (the westernmost one is a Local Wildlife Site) (see Figure 5) and two farm holdings effectively enclosed by the section. A 400kV overhead line crosses this section on an east–west bearing and to which the scheme will connect via a new substation to be constructed by NGET who is the Transmission Owner (TO) in England and Wales. The precise siting and design of that substation is the subject of ongoing feasibility work by NGET, but for Scoping purposes it is assumed to be located at the western end of the Applicant's land (see also paragraph 1.1.13 to 1.1.16 above).

2.1.22 The land within the section is also arable farmland. The Natural England Regional Agricultural Land Classification Map (London and the South-East, ALC007, 2010) confirms the area as likely to be Grade 3/4 agricultural land, which would require further surveys to ascertain whether it is considered BMV agricultural land.

2.1.23 A review of Environment Agency (EA) flood mapping confirms that the large majority of the section is within Flood Zone 1, with a small part in Zone 3 (see Figure 3), but which it is not proposed to build upon.

2.1.24 This section is not covered by, or in close proximity to, any statutory landscape designations (e.g. National Park, AONB, SPA). All of the Southern Site lies within the Oxford Green Belt.

2.1.25 There are no statutory ecological designations on site (SSSI, RAMSAR, LNR etc.) within the Southern Site. The nearest environmental designations are the Hurst Hill SSSI to the south-east, on the other side of the suburb of Chawley, and the Wytham Woods SSSI approximately 1 km to the north.

2.1.26 There are scattered Grade II listed buildings around this section, with a concentration in Cumnor. There is a Grade II* listed Inn in the south of the village. There are multiple PRoWs running through this section, as many originate from Cumnor, to the south. The most impacted PRoWs would likely be the Oxford Green Belt Way and 184/16/20 footpath.

2.2 Legislative Context

2.2.1 The statutory framework for determining applications seeking development consent is provided by the Planning Act 2008 (the 'Act'). Section 104 (2) of the Act states that:

(2) "In deciding the application the Secretary of State must have regard to —

a) any national policy statement which has effect in relation to development of the description to which the application relates (a "relevant national policy statement"),

b) any local impact report (within the meaning given by section 60(3)) submitted to the Commission before the deadline specified in a notice under section 60(2),

c) any matters prescribed in relation to development of the description to which the application relates, and

d) other matters which the Secretary of State thinks are both important and relevant to its decision."

2.2.2 In this respect, Section 104 (3) provides that the Secretary of State (SoS) must decide applications for development consent in accordance with any National Policy Statement (NPS) except to the extent that the SoS is satisfied that one or more of the following exceptions apply:

- that deciding the application in accordance with any relevant national policy statement would lead to the United Kingdom being in breach of any of its international obligations;
- that deciding the application in accordance with any relevant national policy statement would lead to the Secretary of State being in breach of any duty imposed on the Secretary of State by or under enactment;
- that deciding the application in accordance with any relevant national policy statement would be unlawful by virtue of any enactment;
- that the Secretary of State is satisfied that the adverse impact of the proposed development outweighs its benefits; and
- that the Secretary of State is satisfied that any condition prescribed for deciding an application otherwise than in accordance with a national policy statement is met.

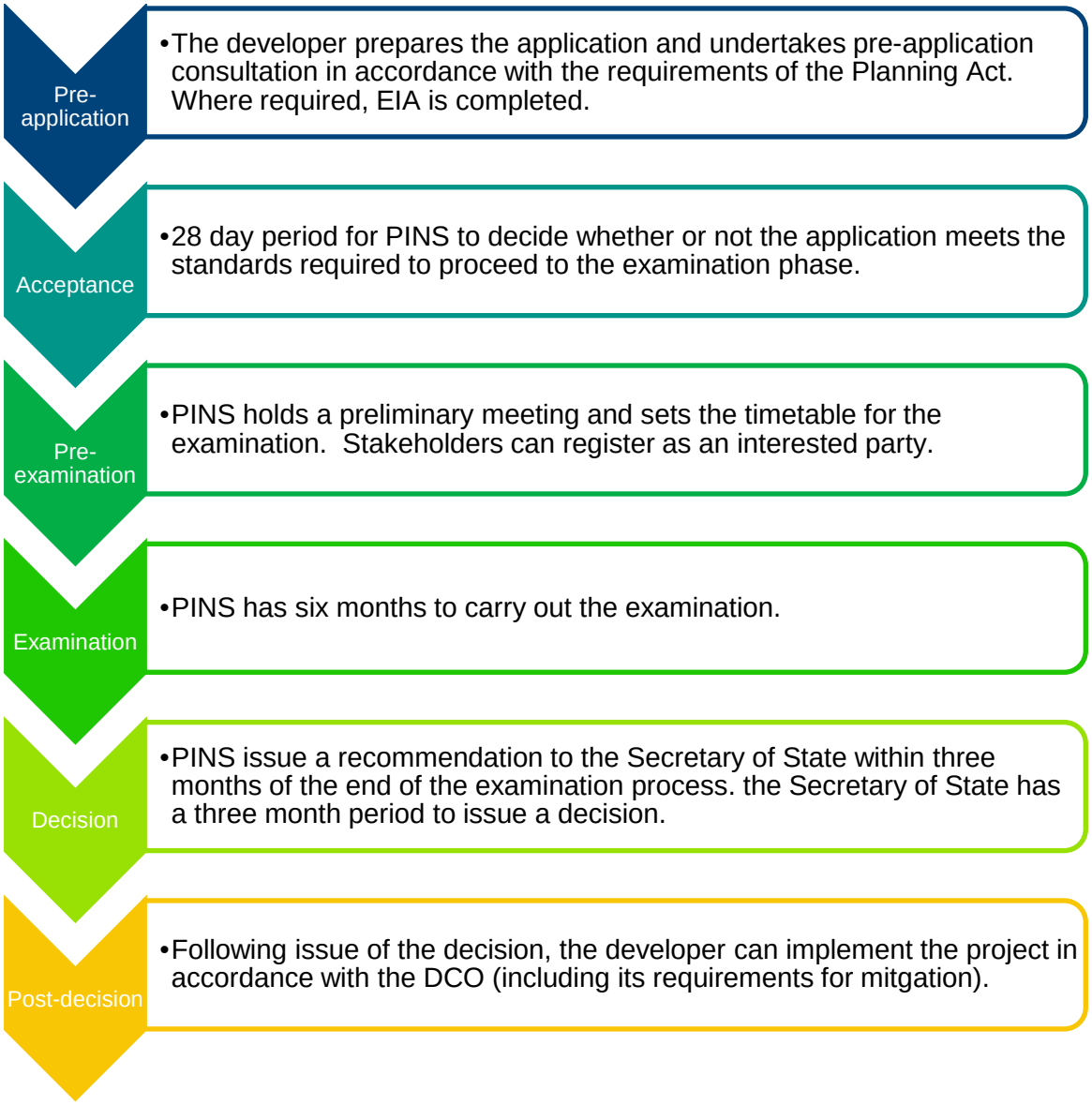
2.2.3 The Applicant will have regard to relevant policy when compiling its PEIR and Environmental Statement. The Applicant also intends to produce a stand-alone Planning Supporting Statement which will set out key policy considerations, assess the project against these and the merits of the Project itself, and draw a planning balance and conclusions on the extent to which the Project complies with policy.

3 CONSENTING AND CONSULTATION PROCESS

3.1 Overview of Consenting Process

3.1.1 As set out in Chapter 1 of this report, NSIPs are defined through the Planning Act 2008. The key stages in the application process are set out below.

Overview of the Application Process



3.1.2 EIA is undertaken during the pre-application stage, with the ES provided as part of the application for development consent.

3.1.3 In addition to development consent under the Planning Act 2008, the Project would require a number of other consents, licenses and permits.

3.2 Consultation Process

3.2.1 Pre-application consultation is an important requirement for development consent applications. It provides an opportunity for interested parties to comment on a project whilst at a formative stage, and for potential issues to be taken into account and, where necessary, addressed before the application is submitted for examination.

3.2.2 The Planning Act 2008, and the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, set out the following requirements for pre-application consultation:

- Notify PINS of the proposed application;
- Produce a Statement of Community Consultation (SoCC) in consultation with the relevant local authorities, setting out how the applicant proposes to consult the local community about the Project to meet the requirements of Section 47 of the Planning Act 2008;
- Publish the SoCC and undertake community consultation in accordance with the SoCC;
- Identify and consult statutory consultation bodies in accordance with Section 42 of the Planning Act 2008;
- Provide preliminary environmental information in accordance with Regulation 12 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended, to the statutory consultation bodies;
- Ensure sufficient time for consultation with the community and with statutory consultation bodies and have regard to relevant responses to publicity and consultation; and
- Prepare a Consultation Report to accompany the application for development consent, setting out details of the above.

Consultation Undertaken to Date

Initial consultation during 2022

3.2.3 On behalf of the Applicant, PVDP undertook early engagement about the Project with the host authorities, political leaders and statutory consultees from September 2022 onwards, including holding a webinar for elected members prior to the start of the first stage of community consultation.

3.2.4 PVDP then undertook its first stage of non-statutory community consultation between Thursday 3 November 2022 and Thursday 22 December 2022, including with Parish Councils and key stakeholder groups. This was extended by a week following high levels of feedback from the community and key stakeholders.

3.2.5 Seven in-person consultation events were held in Woodstock, Long Hanborough, Cassington, Tackley, Cumnor, Eynsham and Begbroke. Two consultation events were added following feedback from the community, with PVDP also holding an online community webinar in early December.

Feedback so far

3.2.6 Engagement during the consultation period was good, including over 620 attendees at in-person consultation events and 56 attendees on the community webinar. Good levels of feedback were received throughout this consultation period, including 767 completed feedback forms (663 digital and 104 hard copies) and 316 pieces of written feedback through the Project communications channels. This feedback has been analysed by the project team and has informed the project design presented in the Scoping Report. The Project will publish a Consultation Summary Report that will capture the feedback received at the first stage of consultation and set out how this has been considered in the evolving design of Botley West Solar Farm.

Next (Statutory) Stage of Consultation

3.2.7 In accordance with Section 47 of the Planning Act 2008, PVDP has developed a SoCC on behalf of the Applicant, the structure and approach of which was reviewed in liaison with the host authorities. Feedback on the SoCC will also comprise part of the next formal stage of consultation.

3.2.8 A second stage of consultation, which will be statutory consultation, is planned for later this year (autumn 2023). The statutory consultation period will be designed to reflect feedback received at the non-statutory consultation, including from community stakeholder, consultees and local authorities.

3.2.9 All consultation materials will tie in with and support the information provided in the Preliminary Environmental Information Report (PEIR).

Preliminary Environmental Information

3.2.10 Following consultation on this Scoping Report, and considering the Scoping Opinion provided by PINS, a Preliminary Environmental Information Report (PEIR) will be prepared to meet the requirements of the EIA Regulations. In addition to the consultation meetings undertaken to date (which will continue through the pre-application phase), the PEIR will form the basis of formal consultation with statutory bodies. As far as possible, it is proposed that the PEIR will take the form of a draft ES, setting out the findings of surveys and assessments available at the time of its publication.

3.3 Next Steps

3.3.1 The details of the Project will be further refined based on the responses to consultation with the community and with the statutory consultee bodies. The consultation responses will be used to inform the final application for development consent and the ES.

3.3.2 The application will be accompanied by a Consultation Report, which will set out details of the consultation undertaken, the responses to consultation and how this has informed the application.

4 APPROACH TO EIA

4.1 Introduction

4.1.1 Scoping is the process of identifying the issues to consider within an ES (establishing the scope of the assessment). As set out in Chapter 1 of this report, scoping is therefore an important preliminary procedure, which sets the context for the EIA process. Through scoping, the key environmental issues are identified at an early stage, which permits subsequent work to concentrate on those environmental topics for which significant effects may arise as a result of a proposed development.

4.1.2 The scoping process is an iterative one, informed by increasing knowledge acquired through the EIA process. The image below highlights some of the key inputs to the scoping process. These inputs include the identification of an initial project description, including the key components of the Project and their likely maximum parameters. Taking this into account, alongside the characteristics of the environment in the vicinity of the site, the requirements of the EIA Regulations can be reviewed to provide an initial indication of the topics likely to be relevant to the Project. From this point, the scope of assessment can be refined through the use of scoping workshops, consultation and the findings of initial assessment by topic specialists.

Overview of Scoping Process

4.1.3 This Scoping Report presents the findings of the scoping process undertaken to date. It identifies the effects that are proposed to be considered within the ES for the Project. Each

topic area is considered, setting out the proposed scope of assessment and identifying any topics that are proposed to be scoped out of the assessment (where no significant effects are considered likely).

4.1.4 A Scoping Opinion is requested from PINS, which will inform the final scope of the ES. It is noted that the scoping process is an iterative one. As assessment work continues and surveys are completed, new issues may arise, or it may become apparent that some potential impacts are not likely to result in significant effects. Where this is the case, the findings of the assessment process will be discussed with consultees in order that the scope of the assessment may be refined as appropriate throughout the EIA process.

4.2 Proposed Approach to the EIA Process

Relevant EIA Guidance

4.2.1 The EIA process will take into account relevant government or institute guidance, including:

- Ministry of Housing, Communities and Local Government (2021) National Planning Policy Framework;
- Department for Communities and Local Government (2021) Planning Practice Guidance at http://planningguidance.planningportal.gov.uk;
- Department of the Environment, Transport and the Regions (DETR) (1997) Mitigation Measures in Environmental Statements. HMSO;
- National Highways et al. (2020) Design Manual for Roads and Bridges, LA 104: Environmental assessment and monitoring;
- Institute of Environmental Management and Assessment (2004) Guidelines for Environmental Impact Assessment;
- Institute of Environmental Management and Assessment (2015a) Environmental Impact Assessment: Guide to Shaping Quality Development;
- Institute of Environmental Management and Assessment (2015b) Climate Change Resilience and Adaptation;
- Institute of Environmental Management and Assessment (2016) Environmental Impact Assessment: Guide to Delivering Quality Development;
- Institute of Environmental Management and Assessment (2017) Health in Environmental Impact Assessment: A Primer for a Proportional Approach;
- Institute of Environmental Management and Assessment (2020) IEMA EIA Guide to: Climate Change Resilience and Adaptation;
- Institute of Environmental Management and Assessment (2022) IEMA Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance;
- Ministry of Housing, Community and Local Government (2015) Planning Act 2008: Guidance on the pre-application process for major infrastructure projects;
- PINS (2017a) Advice Note Three: EIA consultation and notification;
- PINS (2016) Advice Note Six: Preparation and submission of application documents;

- PINS (2020a) Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping;
- PINS (2018a) Advice Note Nine: Rochdale Envelope;
- PINS (2020b) Advice Note Twelve: Transboundary Impacts and Process; and
- PINS (2019) Advice Note Seventeen: Cumulative Effects Assessment.

4.2.2 Other topic-specific specialist methodologies and good practice guidelines will be drawn on as necessary.

Methodology and Assessment Criteria

4.2.3 Each topic chapter of the ES will provide details of the methodology for baseline data collection and the approach to the assessment of effects. Details of the proposed approach for each topic are provided in Chapter 7 of this Scoping Report. Each identified environmental topic will be considered by a specialist in that area. The identification and evaluation of effects will take into account relevant topic-specific guidance where available.

Baseline Conditions

Existing Baseline Conditions

4.2.4 The existing and likely future environmental conditions, in the absence of the Project, are known as ‘baseline conditions’. Each topic-based chapter will include a description of the current (baseline) environmental conditions. The baseline conditions at the site and within the study area form the basis of the assessment, enabling the likely significant effects to be identified through a comparison with the baseline conditions.

Future Baseline Conditions

4.2.5 As set out in Chapter 2, a number of changes are anticipated in the baseline environment, mainly projects that have received planning permission and/or have begun construction. This will be taken into account through the use of future baseline scenarios.

Assessment Years

4.2.6 The scenarios for assessment will be developed during the EIA process. These will include assessment years to allow for identification of the likely effects during the phased construction process and during operation of the Project. At this stage, the following assessment years are under consideration:

- Construction phase: currently planned to occur during period 2025 to 2026;
- First full year of opening: currently planned to be 2027

4.2.7 Each topic-based chapter may also identify additional years to be included in the assessment work, in accordance with topic-specific good practice guidance.

Changes to Baseline Conditions as a Result of Climate Change

4.2.8 The consideration of future baseline conditions will also take into account the likely effects of climate change, as far as these are known at the time of writing. This will be based on information available from the UK Climate Projections project, developed by the Environment Agency and Met Office, which provides information on plausible changes in climate for the UK and on published documents such as the UK Climate Change Risk Assessment 2017 (HM Government, 2017b) and subsequent updates.

Assessment of Effects

4.2.9 The EIA Regulations require the identification of the likely significant environmental effects of the Project. Each topic chapter will take into account both the sensitivity of receptors affected and the magnitude of the likely impact in determining the significance of the effect.

Sensitivity or Importance of Receptors

4.2.10 Receptors are defined as the physical resource or user group that would be affected by a proposed development. The baseline studies will identify potential environmental receptors for each topic and will evaluate their sensitivity to the Project. The sensitivity or importance of a receptor may depend, for example, on its frequency or extent of occurrence at an international, national, regional or local level.

Magnitude of Impact

4.2.11 Impacts are defined as the physical changes to the environment attributable to the Project. For each topic, the likely environmental impacts will be identified. The magnitude of the impact will be described using defined criteria within each topic chapter.

4.2.12 The categorisation of the impact magnitude may take into account the following four factors:

- Extent;
- Duration;
- Frequency; and
- Reversibility.

4.2.13 Impacts will be defined as either adverse or beneficial. Depending on discipline, they may also be described as:

- Direct: Arise from activities associated with the Project. These tend to be either spatially or temporally concurrent; or
- Indirect: Impacts on the environment which are not a direct result of the Project, often produced away from the Site or as a result of a complex pathway.

4.2.14 Impacts will be divided into those occurring during the construction phase and those occurring during operation. Where appropriate, some chapters may refer to these as temporary and permanent impacts.

Significance of Effects

4.2.15 Effect is the term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by correlating the magnitude of the impact to the sensitivity of the receptor or resource.

4.2.16 The magnitude of an impact does not directly translate into significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value, or a large impact on a resource of local value. In broad terms, therefore, the significance of the effect can depend on both the impact magnitude and the sensitivity or importance of the receptor.

4.2.17 Levels of significance that will be used in the assessment include, in descending order:

- Substantial;
- Major;
- Moderate;
- Minor;
- Neutral.

4.2.18 Where an effect is described as 'neutral' this means that there is either no effect or that the significance of any effect is considered to be negligible. All other levels of significance will apply to both adverse and beneficial effects. These significance levels will be defined separately for each topic within the methodology sections. In all cases, the judgement made as to significance will be that of the author of the relevant chapter with reference to appropriate standards/guidelines where relevant.

Mitigation and Monitoring

4.2.19 The EIA Regulations require that where significant effects are identified 'a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce or, if possible, offset likely significant adverse effects on the environment' should be included in the ES.

4.2.20 The development of mitigation measures is part of an iterative EIA process. Therefore, measures will be developed throughout the EIA process in response to the findings of initial assessments. The Project that forms the subject of the application will include a range of measures designed to reduce or prevent significant adverse environmental effects arising, where practicable. In some cases, these measures may result in enhancement of environmental conditions. The assessment of effects will therefore take into account all measures that form part of the Project, and to which the Applicant is committed.

4.2.21 The topic chapters will therefore take into account all measures that form part of the Project, including:

- Measures included as part of the Project design (sometimes referred to as primary or embedded mitigation);
- Measures to be adopted during construction to avoid and minimise environmental effects, such as pollution control measures. These measures would be implemented

through the Code of Construction Practice and/or a Construction Environmental Management Plan; and

- Measures required as a result of legislative requirements.

4.2.22 Where required, further mitigation measures will be identified within topic chapters. These are measures that could further prevent, reduce and, where possible, offset any residual adverse effects on the environment.

4.2.23 In some cases, monitoring measures may be appropriate, for example, to ensure that proposed planting becomes established. Where appropriate, monitoring measures will be set out.

4.3 Structure of the Environmental Statement

4.3.1 Although there is no statutory provision as to the form of an ES, it must contain the information specified in Regulation 14(2), including any information specified in Schedule 4 of the EIA Regulations.

4.3.2 The information to be supplied in the ES will provide a clear understanding of the likely significant effects of the Project upon the environment.

4.3.3 The ES will be structured logically, enabling all relevant environmental information to be found quickly and easily. The ES will describe the EIA process and its findings, and will include the following sections:

- Non-Technical Summary (as a standalone document);
- Written Statement;
- Figures; and
- Appendices.

4.4 Habitats Regulations Assessment

4.4.1 Alongside the EIA process, if required, a Habitats Regulations Assessment (HRA) will be undertaken to meet the requirements of the Conservation of Habitats and Species Regulations 2017. The report of this process will be provided alongside the ES as part of the application for development consent. Although the ES and the HRA report will form two separate reports, corresponding to separate legislative requirements, the authors of the HRA report will work alongside the authors of relevant assessments forming part of the EIA process (such as ecology and air quality) to ensure consistency of data use and to allow the findings of each assessment to inform the other, as appropriate.

5 NEED AND ALTERNATIVES CONSIDERED

5.1 Introduction

5.1.1 This chapter of the Scoping Report provides a summary of the need for the Project and the main alternatives considered by the applicant during the EIA process. It includes a summary of the reasons for the selection of the site, together with a description of the alternative design and layout options that have been considered to date.

5.2 Need

5.2.1 The UK faces a series of challenges to the security of its energy system and the climate change impact of its energy generation. The risk of relying on gas has recently been highlighted in the media but the underlying strategy towards security of supply and moving to a low carbon economy has been in place for many years. The Government, through the Climate Change Act 2008, set legally binding carbon budgets, aiming to cut carbon emissions to net-zero by 2050. In order to achieve this, the UK must decarbonise its energy system, electrify heating, industry and transport. This will result in a significant increase in the use of electricity, at the same time as seven of the UK's eight nuclear power stations close along with all remaining coal power stations.

5.2.2 The Government's recently published 'British Energy Security Strategy'[1] (April 2022) required a 500% increase in solar generation by 2035. This will need the construction of up to 50GW of solar power stations. The challenges that developers face in land assembly, the consenting and permitting process, as well as Grid constraints mean this is a stretching target. It will not be achieved by rooftop solar panels and brownfield sites alone. It will require utility-scale solar power stations delivering large amounts of power to the National Grid, making best use of scarce Grid connections.

5.2.3 BWSF is a project designed to spearhead the renewable transformation of UK generation. The UK grid is constrained, and the 400 kV overhead line (OHL) network is being reinforced all over the country. This means that in many areas no new generation can be connected until 2032. At Botley West the Applicant has an OHL with capacity, land for a new substation and a substation at Cowley which has already been extended by National Grid. The Applicant has up to 1400 ha of suitable, available land to deliver a utility scale solar farm to meet a pressing National need. The Oxfordshire economy is strong and is growing: there is a demand for more, reliable renewable energy in the county, which Botley West will deliver - enough to power the equivalent of approximately 330,000 homes (based on the Government estimate of annual average household power consumption of 4000 kWh.) National Grid will invest in the local high-voltage network, and power will flow into the grid from October 2026.

5.2.4 The costs of submitting a project larger than 50MWe to the Development Consent Order process are high, and the need to generate cheap, subsidy-free power means these power stations must be utility scale - in excess of 250MWe. The UK's electricity needs will not be met by small, patchwork solar installations on roofs and wasteland. The UK needs large

[1] British energy security strategy - GOV.UK (www.gov.uk)

power installations to replace its retiring coal and nuclear fleet, and to meet the huge growth in electricity demand which we will see between now and 2035.

5.2.5 Botley West is designed to help meet the UK's future electricity needs, needs which will not be met if we do nothing and hope the gas price will fall back to 2020 levels. The current international political climate and the growing use of gas as the balancing fuel in a renewables-dominated grid like ours means the price will remain high. The UK economy needs cheap, carbon free energy, which Botley West Solar Farm will deliver to the order of 840MWe.

5.3 National and International Legislation and Policy Context

International and UK-Wide Energy, Climate Change, Energy and Planning Legislation and Policy

5.3.1 The justification for the Project is set within the context of legislation, policy and guidance, and renewable energy targets set at international, UK and Regional Government levels. In recent times there has been a focussed effort both to curb the emissions of greenhouse gases and to secure renewable sources for the generation, and secure supply of, electricity to reduce the dependence on fossil fuels.

5.3.2 The most relevant renewable energy and climate change legislation at an international, UK and national level is summarised below.

Kyoto Protocol 1997

5.3.3 The Kyoto Protocol brings the United Nations Framework Convention on Climate Change into use by committing industrialised countries and economies to limiting and reducing greenhouse gas emissions in accordance with agreed individual targets. The Convention asks those countries to adopt policies and measures on mitigation and to report periodically.

The United Nations Adoption of the Paris Agreement COP21

5.3.4 Some 197 countries, including the UK, adopted the Paris Agreement at the 21st Conference of the Parties (COP21) in Paris in 2015. This is an agreement that seeks to reduce global greenhouse gas emissions and to limit the global temperature increase in this century to 2°C, while pursuing the means to limit this further to 1.5 °C. This was ratified by the UK Government in November 2016 and now forms part of UK Government Policy.

Conference of Parties 26th Session (COP26)

5.3.5 At the COP26 summit in November 2021, parties voted to adopt the draft COP26 report (UNFCC, 2021), known as the Glasgow Climate Pact. This included commitments to phase down the use of coal and supports a common timeframe and methodology for national commitments on emissions reductions. Countries were tasked to return in 2022 with more ambitious 2030 emissions reductions targets.

The UK Climate Change Act 2008 (as amended)

5.3.6 In November 2008, the Climate Change Act became law requiring the UK to reduce carbon dioxide (CO_2) emissions. This was updated in 2019 to provide a legal basis for the target of securing a 100% reduction of greenhouse gas emissions to be achieved by 2050 (compared to 1990 levels).

National Infrastructure Strategy, 2020

5.3.7 The National Infrastructure Strategy focuses on the investment and delivery of infrastructure, which is fundamental to delivering net zero emissions by 2050 (HM Treasury, 2020). The strategy sets out the UK Government's plans to deliver on this target, decarbonising the economy and adapting to climate change:

- Work towards meeting the net zero emissions target by 2050 – Decarbonise the UK's power, heat and transport networks, and take steps to adapt to climate change impacts. This will require increased investments in network infrastructure, storage and increased low carbon generation capacity.
- Reducing emissions across whole sectors of the economy must be done in a sustainable way that minimises cost.

The UK Energy Security Strategy

5.3.8 The UK Energy Security Strategy (HM Government, April 2022) emphasises the need to be more energy independent as a nation, aiming to improve energy efficiency, accelerate the transition from fossil fuels, and expand the renewable energy capacity.

5.3.9 The Strategy highlights the importance of solar energy as a key component of the move to renewables, and seeks a five-fold increase in the provision of solar development to increase to its energy generation to 70GW across the UK by 2035.

The HM Government Energy White Paper - Powering our Net Zero Future

5.3.10 Following the Prime Minister's ten-point plan for a green revolution (HM Government, 2020a), and National Infrastructure Strategy (HM Government, 2020b), the White Paper (HM Government, 2020c) marks a significant milestone in the UK's net-zero transition, setting a net-zero target by 2050 and outlining how this may be achieved. It relates to the generation, supply and use of energy with the drive towards net zero by 2050 at its core, along with energy efficient buildings and lower household bills. It signals a decisive move away from fossil fuel generation and highlights how planned Government investment has the potential to leverage billions of pounds more in private sector funding and support for over 250,000 jobs in the green economy by 2030.

Net Zero Strategy: Build Back Greener, 2021

5.3.11 This strategy sets out the UK's long-term plans to meet net zero emissions by 2050 and gives the vision for a decarbonised economy in 2050 (BEIS, 2021).

5.3.12 The policies detailed in the strategy will be phased in over the next decade or beyond in order to continue decarbonisation towards net zero. They also aim to keep the UK on track to meet upcoming carbon budgets.

5.3.13 This strategy brings forward the ambition for a fully decarbonised power system by 15 years, building on the targets set out in the Energy White Paper and the 10 Point Plan for a Green Industrial Revolution. The ambition is to fully decarbonise the UK's power system by 2035, through the growth in renewable and nuclear power in addition to an increase in energy storage capacity, gas with CCS, and hydrogen to increase the flexibility of supply.

5.3.14 The electricity system will be composed predominantly of wind and solar generation, with a planning increase in offshore wind generation to 40 GW by 2030. To ensure the system is able to reliably meet demand, wind and solar supplied will be complemented by nuclear power and Carbon Capture Utilisation and Storage (CCUS). Flexible technologies, such as interconnectors, electricity storage, and demand-side response, will be implemented to help to minimise the amount of generation and network capacity is needed to meet demand needs.

5.3.15 Further, the strategy outlines aim to support the decarbonisation of the construction and building sector. Reporting on embodied carbon in buildings and infrastructure is sought to be improved, alongside reductions in embodied carbon by way of material substitution, where appropriate, and resource efficiency.

5.3.16 The strategy recognises the importance of addressing the risks of carbon leakage, so policy interventions within the UK do not lead to increased emissions elsewhere. Options will continue to be explored to mitigate carbon leakage, with key efforts to address it through global action on industrial decarbonisation and climate regulation, with continued monitoring of related global policy developments.

Overall Need - Conclusion

5.3.17 There is a strong need case for the increase in UK based renewable energy. This filters down at international level from activities such as the Kyoto Protocol and COP21 and more recently COP26. At a national level, targets of net zero by 2050, phasing out of fossil fuel generation by 2035 and an expansion of low carbon energy supplies so that renewable make up 80% of the generation by 2050 all further support the need case for the Project. Looking at solar specifically, the UK Energy Security strategy highlights the importance of solar energy in the move towards renewables and it outlines that it seeks solar generation to reach 70 GW by 2035. Given the generating capacity of the Project, if consented the Project would significantly help contribute towards this need.

5.4 Alternatives

5.4.1 The EIA Regulations require that an EIA Report should include:

"A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects' (Schedule 4(2)).

5.4.2 This section therefore sets out the key reasons for the selection of the Site and the current layout, taking into account environmental effects.

Do Nothing

5.4.3 The consequence of a do-nothing scenario is that the need for renewable energy to displace fossil fuel energy sources, to provide the UK with energy security, and to achieve net zero by 2030, may not be met without the Project. The need is urgent and significant, as outlined above. A do-nothing strategy would materially undermine the Governments strategy.

Site Location

Location Choice

5.4.4 The location of the proposed site was driven by a number of factors. Discussions were held with National Grid to identify where their priorities were to meet demand and manage the UK electricity supply network. As a result, PVDP became aware that National Grid wished to invest in reinforcing and extending the grid network in the Oxfordshire area, partly in response to Oxfordshire's fast-growing economy and the increasing demand for electricity. Following these discussions, a high-level site search exercise was undertaken by PVDP to consider the availability and suitability of land to accommodate a solar farm.

5.4.5 Those elements in combination led to focus on land in Oxfordshire and ultimately to the proposed application site. The precise project boundaries and overall size of the project have been influenced by landownership, commercial viability, and availability of a grid connection. The boundaries will continue to be refined as necessary in response to known or assumed physical and environmental constraints.

5.4.6 The Site is considered to be a suitable location, taking into account the following:

- land availability;
- its location on low-productivity arable land of low ecological value;
- its location relative to the area energy demand is highest;
- its proximity to the NETS;
- its location outside of any environmental designations;
- its location away from main settlements; and
- its location in an area of low flood risk.

5.4.7 It is recognised that much of the Project is in the Green Belt. Very special circumstances will be set out to explain why the Applicant is siting the development in the Green Belt. Part of the very special circumstances case rests upon availability of a Grid connection and, in particular, the need to connect to the OHL and to Cowley substation, but it will also rely on the urgent need for renewable energy development of this type, as supported by Government policy.

Site Layout and Design

5.4.8 At an early stage of the feasibility of the development of the Project, the Applicant produced a high-level constraints plan to understand site sensitivities in planning and environmental

terms. This provided a framework within which the Applicant could start to consider ways in which the site could be designed and laid out.

5.4.9 The evaluation of site constraints and opportunities presented an opportunity to provide the following:

- area for habitat enhancement, including planting of native species and opportunity to enhance existing habitat;
- ability to enhance the landscape and provide screening for the Project;
- provide safe and optimal access to the Site from the adjacent road network and enhance the existing network of public rights of way, through landscaping and additional footpaths where none existed before.

5.4.10 Constraining factors that affected the evolution of the Project layout and design included:

- proximity of sensitive receptors;
- areas of ancient woodland;
- watercourses and areas at a high risk of flooding; and
- roads, railway lines and overhead power lines.

5.4.11 Buffer zones were then imposed on land adjacent to ancient woodland, within which it was decided that land would remain free from development. Further buffers were imposed to provide set back distances of a minimum 20m from residential properties.

5.4.12 The EIA process has influenced the iterative design process of the Project, through the identification of environmental constraints, consideration of responses received during the consultation process, and identification of environmental effects.

5.4.13 Measures have been included within the Project to reduce the adverse effects on environmental receptors. The design parameters approach to accommodate emerging technology has the potential to further reduce environmental effects. Therefore, there have been a number of iterations and refinements to the layout of the Project.

5.4.14 The final layout for the Project will continue to evolve. For assessment purposes, maximum design parameters will be set for key components of the Project, for which the Applicant will seek consent. In that way the Applicant will have the flexibility to be able to choose the precise type of technology and materials they may wish to employ to deliver the project and provide an efficient facility, whilst at the same time allowing for mitigation and enhancement measures to be incorporated.

6 PROJECT DESCRIPTION

6.1 Introduction

6.1.1 The approach that the Applicant wishes to take to assessment is to define and describe the Project by reference to maximum design parameters, commonly referred to as the 'Rochdale envelope'. The intention is to undertake environmental assessment using maximum design parameters based on that detailed knowledge. In this way, the Applicant preserves the flexibility to decide on detail matters post consent, but without undermining the robustness of the environmental assessment of the project and the ability to mitigate effects and provide enhancements to the area.

6.1.2 The precise extent of the site and solar installation is still being informed by current environmental assessment work and by technical and commercial factors, but the Project will be confined to the Project boundary as shown on Figure 1.

6.1.3 The Applicant has secured a grid connection from NGET at Cowley substation, the grid supply point (GSP) to the south of the Oxford Mini plant. The power will be transmitted there via the existing 400kV overhead line and a new substation, known as 'Botley West' (and hence the naming convention for the Project), to be constructed by NGET in the southern area of the Site.

6.1.4 Draft layout plans are shown at Figure 1 comprising an overall plan of the proposed development area including the likely export cable corridor route, along with three distinct sites of the scheme – Northern, Central and Southern – with their area in ha.

6.2 Operational Development

6.2.1 During the operational phase, activity on the Site will be minimal and will be restricted principally to landscape and ecology management, equipment/infrastructure maintenance and servicing including cleaning and replacement of any components that fail, and monitoring to ensure the continued effective operation of the development. Operational staff will require access to the Site during daylight hours, seven days a week.

6.2.2 The undeveloped areas of the site will be designed and managed to enhance the landscape and ecological value of the area. The Applicant and the landowners are keen to secure these and any other benefits that the local community and other stakeholders may wish to promote. Discussions are advanced in respect of allowing land to be given over to community groups for small scale food production, and for some parts of the site to be given over to sheep farming. The precise nature, location and extent of these areas will be addressed within the PEIR and Environmental Statement, making assumptions where necessary.

6.2.3 The key components of the Project comprise the following:

- Solar PV Arrays;
- Solar PV Modules;
- Transformers, Switchgear and supporting equipment within Power Converter Stations;
- Inverters;

- Switchgear;
- Power Converter Stations (i.e. project substations and control buildings);
- High Voltage Transformers, including feeders, switchgear and supporting equipment;
- Onsite cabling;
- Electricity export cabling and connection to the NGET substation;
- NGET substation;
- Fencing, security and ancillary infrastructure;
- Accesses from the highway and tracks; and
- Green infrastructure (GI).

6.2.4 Maximum design parameters will be set for the above development components within which the detail will evolve.

6.2.5 The following section provides further detail on the main components of the operational development.

6.2.6 The parameters used in the EIA are summarised in Table 6.1 below.

Table 6.1: Solar Design Parameters

Project Component	Current Detail	Parameter
Site Areas		
Total developable area for solar arrays – North	Approx. 266 ha	Approx. 266 ha
Total Developable area for solar array – Central	Approx. 639 ha	Approx. 639 ha
Total Developable areas for solar array - South	Approx. 51 ha	Approx. 51 ha
Solar modules		
Indicative Number of Solar PV Modules	Approx. 2,663,570	Range from 2.500,000 to 2,800,000 PV modules
Watts peak (Wp)	1,350 MWp	1250 to 1450 MWp
Indicative Solar PV Module Dimensions	Width (mm) 1.102	1.1 to 1.4 mm
	Length (mm) 2.187	2.1 to 2.3 mm
	Depth (mm) 35	30 to 40 mm
	Area (m^2) 2.41	2.3 to 2.5
Indicative Slope of Solar PV Modules from Horizontal	15 degrees	12 to 18 degrees

Project Component	Current Detail	Parameter
Minimum height equipment above ground level (AGL)	0.6 m	0.6 to 0.8m
Height range of solar PV modules (AGL)	1.8m to 2.5 m	1.8m to 2.5m
Indicative Solar PV Module Colour	Dark Blue	Dark blue or dark grey or black
Frame type	Anodized Aluminium Alloy	Anodized Aluminium Alloy
Indicative Number of Pyranometers	56	50-60
Indicative Table Width (incl. Ridge Break) East/West Width (incl. Ridge Break) East/West Width	14.57 m (13 x 2 modules plus gaps in-between of 20 mm) Portrait Configuration	14-22 m
North/South separation distance (m) between tables	2.0 m	1.5 m to 3.0 m
East/West separation distance (m) between tables	300.00 mm	250.00mm to 500.00mm
Indicative Mounting Structure Material	Mix between galvanized steel and aluminium fixed tilt with stainless steel screws and clamps	Mix between galvanized steel and aluminium fixed tilt with stainless steel screws and clamps
Distance between site boundary and table areas (m)	7.00 m	6.0 m to 50.0 m
Indicative Foundation Type	Driven-piles or screw piles	Driven-piles or screw piles
Indicative Total number of piles	Max. Number of piles: 2,151,366	2,000,000 to 2,500,000 Use of concrete shoes possible but only in areas of high archaeology interest
Depth of piles below ground level (m)	1.0 m to 2.0 m	1.0 m to 2.5 m
Electrical Components		
Indicative Number Power Converter Stations (PCS)	156 Power Converter Stations (1 per 7ha) Sound power levels: 67 dB (10 m distance) Forced fan cooling under unfavourable conditions (T>30°C)	1 per 7ha

Project Component	Current Detail	Parameter
	PCS containing two inverters plus two MV transformers	
Power converter station (PCS) Dimensions	Height (mm) - 2896	2700 - 3500
	Width (mm) - 12192	12000 - 14000
	Depth (mm) - 2438	2200 - 2900
Indicative Number of HV Transformer (Secondary substation)	6no. 33/220 kV 50 dB (10 m distance)	4 to 8no
Indicative Power Rating (MVA) MV Transformer Indicative Power Rating (MVA) HV Transformer Dimensions (Secondary Substation)	MV [6 MVA] HV (4 x 200 MVA, 1 x 80 MVA,1 x 60 MVA) subject to further investigation 50 dB (10 m distance)	
Indicative HV Transformer Dimensions (Secondary Substation)	Length (m) - 15	12 – 18 m
	Width (m) - 8	6 – 10 m
	Height (m) – 5.0m plus height of isolator 50 dB (10 m distance)	4.0 m – 6.0 m (inc isolator)
Indicative Transformer Foundation Dimensions (below ground level)	Length (m) - 20	19 – 22.0m
	Width (m) - 19	18 – 21m
	Height (m) - 1	0 – 1.0 m
Indicative Transformer Colour	Grey	Grey
Electrical Cabling maybe included in mounting structure		
DC Cables from Solar PV Modules to Inverters	DC string cables in the mounting structure, DC collection cables in underground trenches Depth: between approx. 40 and 80 cm Length - TBD	DC string cables in the mounting structure, DC collection cables in underground trenches Depth: between approx. 40 and 80cm Length - TBD
AC Cables from Transformers to Secondary Substation (HV Transformer) (33/220kV)	Underground Depth: Roadways: approx. 75-85 cm Good agricultural land: approx. 91-101 cm Footpaths, verges, uncultivated land: 75-85 cm Length TBD	Depth: Roadways: 75 – 85cm Fields: 90 – 105cm Footpaths, verges: 70-90cm

Project Component	Current Detail	Parameter
NGET substation	Footprint 165 x 135m Max height – 12m Site area – 2.3ha	180 x 150m 12 - 18m 3.8ha

Solar PV Array Land Parcels

6.2.7 The large, mostly arable, areas within the Site have been sub-divided using existing physical features such as hedgerow, ditches and overhead power lines into developable land parcels. The extent to which and how these land parcels will be developed will be determined through responses to consultation, an assessment of physical and environmental constraints (such as minimum separation distances to sensitive ecology), and other commercial considerations. At present, it is intended that the PEIR will map the widest extent of the areas within which the solar arrays will be located, but include an illustrative masterplan of the Applicants current layout and design approach within those areas.

Solar PV Modules (Solar Panels)

6.2.8 The proposed solar PV modules convert solar irradiance (light) into direct current (DC) electricity. They are designed to maximise the absorbency of the sun's rays and minimise solar glare. The individual solar PV modules within the development site are likely to consist of dark blue, and/or dark grey and / or black, photovoltaic (PV) cells. A range of alternative PV technologies is developing rapidly and may be available at the time of construction, therefore the solar PV modules are not limited to a particular type of PV cell. The modules are likely to be between 1.8m to 2.5m above ground level in height, although lower modules of 0.6m to 1.8m may be used in some areas.

Main components of solar panels

- Solar photovoltaic cells -Silicon
- Toughened Glass (only front or front and rear)
- Extruded Aluminium frame
- Encapsulation - EVA film layers (rear)
- Polymer rear back-sheet
- Junction box - diodes and connectors

Solar PV Module Mounting Structure

6.2.9 The solar PV modules are expected to be mounted on a metal framework. This is likely to be formed using a mix between galvanised steel and aluminium with stainless steel, supported by galvanised steel piles or screws driven into the ground by an impact piling or

screwing rig to a depth[2] of approximately 1.5 to 2 m. In sensitive areas of archaeology, 'concrete shoes' (or similar) might be used to hold the frame to the ground, rather than piling, to avoid underground impacts on any archaeology.

Transformers

6.2.10 Middle Voltage (MV) Transformers (1kV/33kV) are required to control and increase the voltage of the electricity generated across the solar PV tables before it reaches the High Voltage transformer.

Inverters

6.2.11 Inverters are required to convert the DC electricity generated by the PV modules into alternating current (AC), which allows the electricity to be exported to the NETS. Inverters are sized to deal with the level of voltage which is output from the strings of solar PV modules.

Power Converter Stations (PCS)

6.2.12 MV Transformers (1kV/33kV) and switchgears will be housed in one unit known as a Power Converter Station (PCS). There will be approximately 156 PCS located within the solar PV installation area. The dimensions of a PCS are approximately 12m long and 3m high. Inverters might also be located within the PCS. Sound levels are expected to be 67 dB (10 m distance)

High Voltage Transformers

6.2.13 High Voltage (HV) Transformers (33/220 kV) are required to increase the voltage of the electricity coming from the MV Transformers and to connect the three development sites with the Main Transformers (220/400kV) and the NGET substation. The HV Transformers will be located within the solar PV installation area. In total, there will be 6 HV Transformers and two Main Transformers (220/400kV). The dimensions of a HV transformer are approximately 15m long and 5m high.

Electrical Cabling

6.2.14 On site electrical cabling is required to connect the solar PV tables to the combiner boxes and from combiner boxes to the inverters as DC cabling system, and then to the transformers on site as AC, MV and HV cabling systems. Higher rated cables are then required between the transformers and the secondary substation (HV transformer) within the electrical compound.

DC Cables

6.2.15 DC cabling between modules and combiner boxes will be installed above ground, fixed to the mounting structure and also laid underground. The DC cable from combiner boxes to

[2] These depths are approximate and variable depending on localised ground conditions.

inverters will be set approximately 40 to 80cm underground. All above ground cables will be routed through conduit and racking secured to the solar PV module mounting structures.

AC Cables

6.2.16 AC cables from the inverters to the substation will be routed through underground cable trenches. The AC cables between the transformers and the Project substation will be buried at the following approximate depths:

- Roadways: 75-85 cm
- Good agricultural land: 91-101 cm
- Footpaths, verges, uncultivated land: 75-85 cm

Landscaping

6.2.17 Planting and management of grassland, hedgerows, trees and areas of scrub is proposed across the site for landscape, visual and biodiversity mitigation and enhancement. Areas under and around the panels will develop vegetation that is fit for grazing by sheep or can be cut back to produce compost. In areas not affecting power generation vegetation growth will be facilitated to improve biodiversity.

6.2.18 Any necessary mitigation measures will be undertaken on additional areas, to be defined in the course of consultations.

6.2.19 Further actions will be undertaken, where necessary, to reduce the visual impact of the project by observing reasonable distances and additional planting.

6.2.20 Landscape mitigation will be embedded in the overall project design and would be formulated to minimise potential landscape and visual impacts and maximise enhancement of landscape features, landscape character and biodiversity of the site. A landscape masterplan will be presented being informed by experience of similar projects and good practice guidance relating to retention and enhancement of woodlands, trees and hedgerows. The landscape masterplan would include opportunity to create new habitats such as hedgerows, tree planting woodland and meadows in keeping with the characteristics of the host landscape character types.

Earthworks

6.2.21 Earthworks on the Site (e.g., transformer foundation excavations) may result in a small surplus of material within areas of the Site. This material will be reused in landscaping and restoration of the Site during and after construction, and will not be exported.

Grid Connection

6.2.22 The Project will connect to the National Grid transmission system via a new National Grid 400kV substation to be located close to the existing National Grid 400kV line that runs between Cowley and Walham. Discussions have been ongoing with NGET regarding the location for their substation, based upon their own assessment and evaluation work. Whilst, at the time of writing this report, a final decision has yet to be taken by NGET, it is likely that the NGET substation will be located in one of two possible locations:

1. On land within the Applicant's control, at its Southern Site, at the western most extremity, south of the Farmoor Reservoir.
2. On land near the Applicant's Southern Site, to the west of that site, south of the Farmoor Reservoir.

6.2.23 For Scoping purposes, the Applicant assumes that the NGET substation will be within the Applicant's site, as described in Option 1 above, and powers will be taken to consent that substation as part of the Applicant's DCO. If NGET decides not to locate their substation within the Applicant's site, then PVDP will assess:

a. an alternative location, assumed to be close to the Southern Site at its western end, on a cumulative basis, with NGET seeking consent via the Town and Country route; and
b. the substitution of solar panels for the substation on the land referred to in Option 1 above.

6.2.24 The area to be set aside for the NGET substation amounts to approximately 3.8 ha. Within that area it is assumed that the substation itself will occupy a footprint of approximately 165m by 135m, with a maximum height of 15m, excluding connecting tower structures.

6.2.25 The substation is to be constructed by NGET in the Southern Project Site between the B4017 and the B4044, the precise design and position of the substation will be decided by NGET.

6.2.26 The three main Project sites (Botley North, Central and South) will be connected via 220kV underground cables. These 220kV cables are required to connect all Project sites with the main substation called Botley West.

Site Access

6.2.27 Vehicular access to serve the installation areas will either be through existing field entrances or purpose-built new access roads.

Other Infrastructure

6.2.28 Fencing, lighting and new vehicular accesses will also need to be constructed. The fencing will be for operational security purposes and may be up to 2m in height. Lighting and CCTV might be installed too, but on limited areas of the development, generally around the high voltage infrastructure. Access requirements both temporary and permanent are being considered. Table 2 below provides more details.

Table 6.2: Other Infrastructure Design Parameters

Project Component	Current Detail	Parameter
Fencing	Length (km) Botley North – Approx 25 Botley Central – Approx 78 Botley South – Approx 8.5	Length (km) Botley North – Approx 25 Botley Central – Approx 78 Botley South – Approx 8.5

Project Component	Current Detail	Parameter
	Height (m AGL) - Approx 2	Height – 1.8m to 2.1m
CCTV	No. of CCTV cameras – 306 or one every 365m	No. of CCTV cameras – between 10 - 100
	Support Column Details 100 mm box section galvanized steel column or wooden pole	Support Column Details 100 mm box section galvanized steel column or wooden pole
	Camera Height (m AGL) - 3	3.0 m to 4.0 m
	Camera Position - 1m inside the fence boundary	Camera Position – 1m to 2m inside the fence boundary
	CCTV Lighting Infrared outside daylight hours (not visible light) No lighting will be permanently operated.	CCTV Lighting Infrared outside daylight hours (not visible light) No lighting will be permanently operated.
Lighting	Solar PV Array transformers Manually operated lighting PIR motion sensor activated security / emergency lighting.	Solar PV Array transformers Manually operated lighting PIR motion sensor activated security / emergency lighting.
	Electrical Compound(s) Manually operated lighting Passive infra-red (PIR) motion sensor activated security / emergency lighting.	Electrical Compound(s) Manually operated lighting Passive infra-red (PIR) motion sensor activated security / emergency lighting.

6.3 Construction

6.3.1 The construction of all aspects of the Project is subject to the final Project design and potential environmental constraints. It is anticipated to last 24 months. The indicative start date for construction is dependent on when the necessary consents are granted. The following are the main construction activities:

- Site preparation
- Delivery of construction material, plant and equipment to site
- Establishment of the perimeter fence and main construction compound(s)
- Solar PV array construction
- Delivery of components to site
- Erection of module mounting structures
- Mounting of modules and power converter stations
- Trenching and installation of electric cabling
- Transformer foundation excavation and construction
- Installation of transformers
- Construction of onsite electrical infrastructure
- Testing and commissioning
- Landscaping and other environmental enhancements

Construction Control Mechanisms

6.3.2 Construction will be outsourced to a reputable, experienced contractor under an engineering, procurement and construction (EPC) contract. This type of contract is sometimes referred to as 'turn-key' arrangement. The EPC contractor will provide market terms for warranties, completion and performance guarantees. PVDP has in-house experience in managing construction companies but will additionally employ specialized consultants to oversee the construction and commissioning process. The EPC contractor will provide operation and maintenance ("O&M") services during the warranty period, thereafter a dedicated PVDP-company will take on these responsibilities. High voltage and grid connection equipment will be serviced by specialized companies on a subcontract basis.

6.3.3 Prior to EPC tender and procurement, PVDP will set out its expectations of a future contractor including best practice environmental protection measures during construction. An Outline Code of Construction Practice (Outline CoCP) will be produced to accompany the Environmental Statement (ES). ES chapters will be able to rely on assumptions for mitigation measures contained in the Outline CoCP.

Temporary Construction Compounds

6.3.4 There will be four main temporary construction compounds in the Project Sites, one in the North, two in the Central and one in the South. The temporary construction compounds will

be carefully located in order to minimise environmental or amenity impact. Topsoil and subsoil will be stripped from such areas and stored on site for replacement following the completion of construction works. Each compound will have fencing and suitable hard standing, offices, welfare facilities and generators to supply electricity.

6.3.5 The temporary construction compounds will be returned to original state upon completing construction.

Temporary Field Compounds

6.3.6 There will be temporary compounds for each of the individual installation areas which will serve as storage and welfare facilities.

6.3.7 The temporary field compounds will be returned to their previous use upon completing construction.

6.4 Decommissioning and enhancement

6.4.1 When the operational phase ends, the Project will be decommissioned. The anticipated period of operation and decommissioning is 42 years. All solar PV array infrastructure including solar PV modules, mounting structures, cabling, inverters and transformers will be removed from the site and recycled or disposed of in accordance with good practice and market conditions at that time.

6.4.2 A decommissioning and enhancement plan, to include timescales and transportation methods, ecological and landscape enhancements and other environmental improvements, will be developed in consultation the local planning authority, local community and key stakeholders and form and integral part of the DCO application.

7 PROPOSED SCOPE OF ASSESSMENT: ES CHAPTERS

7.1 Historic Environment

7.1.1 The historic environment chapter will examine the cultural heritage and archaeological baseline of the Site and assess the significance of the effect upon designated and non-designated heritage assets arising from the development of the Project.

Legislative and policy context

7.1.2 The following key legislation and policy documents relevant to the historic environment will be considered within the assessment process:

- Infrastructure Planning (Decisions) Regulations 2010;
- Ancient Monuments and Archaeological Areas Act 1979 (amended by National Heritage Act (1983) and the National Heritage Act (2002);
- Planning (Listed Buildings and Conservation Areas) Act (1990)
- National Policy Statement for Energy EN-1(and draft version)
- National Policy Statement for Renewable Energy Infrastructure EN-3 (and draft version)
- National Policy Statement for Electricity Network Infrastructure EN-5 (and draft version)
- National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021);
- Vale of White Horse Local Plan 2031 Part 1: Strategic Sites and Policies, Core Policy 39: The Historic Environment;
- West Oxfordshire Local Plan 2031, Policy EH9: Historic Environment;
- Cherwell Local Plan 2011-2031 (incorporating re-adopted Policy Bicester 13), Policies ESD 13: Local Landscape Protection and Enhancement and ESD 15: The Character of the Built and Historic Environment.

Guidance documents

7.1.3 Guidance documents relevant to the historic environment that will be considered within the assessment process include the following:

- Planning Policy Guidance: Historic Environment (Ministry of Housing, Communities & Local Government, 2019);
- Managing Significance in Decision-Taking in the Historic Environment: Historic Environment Good Practice Advice in Planning Note 2 (Historic England, 2015);
- The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 (Historic England, 2017);

- Guidance and Toolkit for Impact Assessments in a World Heritage context (UNESCO, ICCROM, ICOMOS and IUCN, 2022);
- Principles of Cultural Heritage Impact Assessment in the UK (IEMA, IHBC and CIfA, 2021);
- Standard and guidance for historic environment desk-based assessment (Chartered Institute for Archaeologists (CIfA), 2014a);
- Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (CIfA, 2014b);
- Standard and guidance for archaeological geophysical survey (CIfA, 2014c);
- Standard and guidance for archaeological field evaluation (CIfA, 2014d);
- Standard and guidance for the collection, documentation, conservation and research of archaeological materials (CIfA, 2014e); and
- Standard and guidance for the collection, compilation, transfer and deposition of archaeological archives (CIfA, 2014f).

Baseline Information

7.1.4 During the initial design phase for the Project, the online National Heritage List for England and other available information pertaining to the location of designated heritage assets were examined. The Project boundaries have been established for operational and construction purposes, which ensure that there are no designated heritage assets situated within any part of the Site within which development is proposed.

7.1.5 The World Heritage Site of Blenheim Palace is located just to the west and north of the proposed Central Site. The boundary of the World Heritage Site is almost contiguous with the boundary of the Blenheim Palace Grade I Registered Park and Garden, whilst this defined historic landscape also contains numerous listed buildings including the palace, the water terrace gardens and Bernini fountain, the Grand Bridge and the New Bridge (all listed at Grade I), also two statues in the east formal garden, the Temple of Diana, the Temple of Health, and High Lodge (all Listed at Grade II*).

7.1.6 There are concentrations of listed buildings within the villages close to the perimeter of the Site, such as Bladon, Begbroke, Wootton, Church Hanborough, Cassington and Cumnor. Most examples are listed at Grade II; those with a higher level of listing include the Church of St Peter and St Paul (Church Hanborough), the Church of St Peter (Cassington) and the Church of St Michael (Cumnor), all of which are listed at Grade I, and also the Church of St Michael (Begbroke), the Church of St Mary (Wootton) and the Bear and Ragged Staff Inn (Cumnor) which are all listed at Grade II*.

7.1.7 Outside of the villages, listed buildings close to the perimeter of the Site include the Grade II* listed Hordley House and nearby Grade II listed gazebo, near Wootton; also a number of Grade II listed buildings at Lower Dornford Farm, Old Man Leys Farm, Spring Hill, Burleigh Farmhouse, Rectory Farmhouse and The Old Rectory (both in Worton), City Farm, Eynsham Mill and Upper Whitley Farm.

7.1.8 In addition to the Registered Park and Garden at Blenheim Palace, there is also a Grade II Registered Park and Garden at Yarnton Manor along with the Grade II* listed manor house

and associated Grade II listed buildings. The Grade I listed Church of St Bartholomew at Yarnton is just to the east of the manor and the churchyard there contains a Grade II* listed churchyard cross as well as several Grade II listed tombs and tombstones.

7.1.9 Conservation Areas have been designated at Bladon, Begbroke, Wootton, Church Hanborough, Cassington and Cumnor. Those at Wootton and Church Hanborough include quite extensive areas of land around the historic cores of the village and the perimeter of the Site has been adjusted in these locations so that no part of the Project within which development is proposed would be within a designated Conservation Area.

7.1.10 The Roman Road known as Akeman Street passes through the northern block of the Site on a north-east to south-west alignment. Land directly adjacent to the perimeter of the Site in this area has been designated as a Scheduled Monument, due to the presence of a Roman villa here, although the evidence indicates that the area of Roman activity extends beyond the Scheduled land. Not far to the south, and again just beyond the perimeter of the Site, is a second Scheduled Monument comprising a rectangular earthwork. The date of this remains unknown but it may well be later prehistoric or Roman and could be associated with the known villa and Roman road to the north.

7.1.11 A second Scheduled Roman villa is located just to the east of the World Heritage Site at Blenheim Palace, whilst further south a hillfort on Bladon Heath (and known as Bladon Camp) is also Scheduled.

7.1.12 With regard to non-designated heritage assets, the location of the Site, within the well-drained landscape of the Thames Valley, means that there is reasonable potential for buried archaeological remains to be present within all parts of the Site. Investigations undertaken in connection with gravel extraction around Purwell Farm in the central block of the Site identified activity from the Bronze Age and the Iron Age as well as extensive evidence of settlement, industry and burial during the Anglo-Saxon period.

7.1.13 Elsewhere within the Site, features recorded as cropmarks on aerial photographs include enclosures as well as ring ditches that may represent the remains of burial monuments of probable Bronze Age date. Artefacts recovered from various locations within the Site include material dating from the Mesolithic period through to the Post-medieval and Modern eras.

Proposed Scope of the Assessment

7.1.14 It is proposed that the findings of the assessment of effects on the historic environment would be set out as a topic chapter within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Proposed Scope of Baseline Studies

7.1.15 The HER data will be acquired and collated and will be presented within a detailed historic environment desk-based assessment. This assessment will include a review of previous archaeological investigations within the Site and an appropriate study area, and may (where necessary) utilise the acquisition of information not yet in the public domain. Historic maps and other relevant documents will be examined in order to reach an understanding of the archaeological potential within the Site. A Written Scheme of Investigation (WSI),

setting out the methodologies to be utilised within the desk-based assessment, will be submitted to the Lead Archaeologist at Oxfordshire County Council for approval.

7.1.16 A separate but complementary study will examine the evidence for archaeological sites and features within the Project Site area from historical aerial photographs held at available and appropriates sources and from available LiDAR data. This study will be undertaken by suitably qualified and experienced persons. The key results of this study will be presented within the historic environment desk-based assessment, with the detailed report available as a technical appendix to the ES.

7.1.17 A geophysical survey (magnetometer) will be undertaken within the Site. This will cover all land within which the construction and operation of the Project could result in physical impacts. Land within the Project Site where no impacts are likely, such as land set aside as 'buffer areas' around settlements or for environmental mitigation, will not be surveyed. The geophysical survey will be undertaken in accordance with a WSI that will be submitted to the Lead Archaeologist at Oxfordshire County Council for approval. The key results of this survey will be presented within the historic environment desk-based assessment, with the detailed report available as a technical appendix to the ES.

7.1.18 Any land considered to have potential for the presence of buried archaeological remains and which will be impacted by the Project may require further archaeological investigation to an appropriate level commensurate with the perceived importance of the archaeological remains and the likely nature and extent of any impacts. The timing, nature and extent of the programme of further archaeological investigation will be agreed through a consultation process with the Lead Archaeologist at Oxfordshire County Council.

7.1.19 The historic environment desk-based assessment will identify designated heritage assets whose significance may be affected through changes in their settings resulting from the construction, operation and decommissioning of the Project. This will also include locally listed buildings. For each such heritage asset, examination will be made regarding the importance of the asset and how the setting contributes to that importance.

Proposed Approach to Identifying Future Baseline Conditions

7.1.20 Changes to the baseline conditions in the future could include amendments to the list of designated assets, e.g. additional designations of Scheduled Monuments, listed buildings (including locally listed buildings), Registered Parks and Gardens, Conservation Areas, or amendments to the extent and description of any of these asset types.

7.1.21 Additional changes could occur as a result of Project in the area occurring in the absence of the Project, or as a result of increased knowledge through archaeological investigations undertaken with regard to other developments within the study area or as part of more extensive programmes of research in the area.

7.1.22 Changes to historic environment resources as a result of climate change could occur through processes of increased desiccation of waterlogged areas or through increased rainfall which could affect the footings and/or the above-ground fabric of historic structures.

Study Areas

7.1.23 The study area for the archaeological element of the historic environment desk-based assessment will extend to 1 km from the boundary of the Site. This is considered to be a

sufficient area to provide a reasonable understanding of the likely nature and date of archaeological resources within the proposed Site, and has been selected on the basis of previous experience and knowledge of the general area. For any part of the cable route which connects the three core parts of the Site and which falls outside of the study area defined above, a separate study area will be used which extends to 500 m either side of the cable route. Consideration of the archaeological potential within the study area will take general account of the known archaeology and history of a much wider area of the Thames Valley.

7.1.24 The study area for the identification of designated heritage assets will extend for 2 km from the boundary of the Site. Examination will be made of the Zone of Theoretical Visibility (ZTV). This may result in some of the designated heritage assets within the defined study area being removed from the assessment as a result of a lack of potential for visual impacts, although other possible impacts (such as noise) will also be considered within this process. It is possible that designated heritage assets beyond the defined study area will need to be included within this review. These may be assets which include designated views towards the Site, or possibly ones which have a particular iconic status that may be affected by the Project. Such assets would be identified through consultation with Historic England and the heritage advisors to the local authorities.

Effects Proposed to be Assessed

7.1.25 The following potential effects will be considered within the EIA process:

Table 7.1: Potential Effects to be Considered – Historic Environment

Activity	Potential Effects
Construction Phase	
Construction activities including compounds, access tracks etc	Loss of, or damage to, heritage assets as a result of construction activity (e.g. physical removal or disturbance of archaeological remains, where these are still present).
Construction activities	Effects resulting from changes within the settings of designated and non-designated heritage assets as a result of construction activity (including light and noise).
Construction activities	Effects resulting from changes to the wider historic landscape as a result of construction activities.
Operational Phase	
Operation of solar farm	Effects resulting from changes within the settings of designated and non-designated heritage assets as a result of the presence of the solar farm.
Operation of solar farm	Effects resulting from changes to the wider historic landscape as a result of the presence of the solar farm.
Decommissioning phase	
Decommissioning activities	Effects resulting from changes within the settings of designated and non-designated heritage assets during decommissioning of the solar farm.
Decommissioning activities	Effects resulting from changes to the wider historic landscape during decommissioning of the solar farm.

Approach to Assessment of Effects

7.1.26 The identification of heritage assets whose importance could be affected by the Project will facilitate input into the on-going design process. This could include input into landscape design and mitigation, as well as informing the physical location of scheme elements. This

will be undertaken alongside the assessment of impacts resulting from changes within the settings of heritage assets and will be undertaken in liaison with the consultant team undertaking the assessment of effects on landscape, townscape and visual resources. Aspects where a joint approach is proposed include establishment and review of the ZTV and also the locations and extent of viewpoints from which visualisations (e.g. photomontages, wirelines etc.) may be produced. Final selection of any viewpoint locations for the historic environment assessment will be agreed following consultation with Historic England and the heritage advisors to the local authorities.

7.1.27 The assessment of the likely effects on the historic environment will include the following:

- Identification of heritage assets that could be affected by the Project along with a description of the significance of those assets including the contribution made by their setting;
- Identification of the likely impacts of the Project on the importance of heritage assets within the Project Site and the defined study areas; and
- Assessment of significance of effects, taking into account measures proposed to avoid, reduce or offset adverse effects, or to enhance existing conditions.

7.1.28 The assessment would follow the approach set out in Chapter 4 with regard to identification of receptor sensitivity, impact magnitude and evaluation of significance of effects. The terms used to describe the significance of heritage assets and receptor sensitivity will be defined separately for buried archaeology, built heritage and historic landscape.

7.1.29 The evaluation of significance will be underpinned through the use of a narrative approach, particularly with regard to the impacts resulting from changes within the settings of heritage assets. This approach is in line with guidance published by Historic England in Planning Note 3 (Historic England, 2017). The assessment will include consideration of harm to, and loss of, the significance of heritage assets, and will seek to identify any benefits to the significance of heritage assets that may arise from the Project.

Approach to Mitigation, Enhancement and Monitoring

7.1.30 Any further archaeological investigation required after the granting of the DCO will be carried out in accordance with a WSI agreed in advance with the Lead Archaeologist at Oxfordshire County Council. The WSI will describe the nature and extent of the proposed archaeological investigations, along with the approach towards the appropriate reporting of results, treatment of artefacts and deposition of the resultant archive.

7.1.31 Consideration will be given to any situation where the Project will lead to effects on the significance of heritage assets as a result of change within their settings. It may be possible that mitigation could be proposed that would eliminate or reduce any adverse effects. No monitoring of the effects of change within the setting of heritage assets is proposed.

Assumptions and Limitations

7.1.32 The baseline information is taken from sources such as the Oxfordshire HER and represents the current state of knowledge. Much of the information is the result of archaeological investigations undertaken ahead of and during previous developments. Given that much of the proposal site is undeveloped this presents a limitation which will be addressed through the undertaking of the surveys described above.

Issues Proposed to be Scoped Out

7.1.33 Any effects on buried archaeological remains would occur during the construction phase, as it is during this phase that ground disturbance, including excavation and tracking of vehicles would occur. This could lead to loss of or damage to archaeological resources. Such effects are considered to be permanent and irreversible. No further groundworks are proposed during the operational phase and no new areas would be affected by decommissioning activities including vehicle movements. Therefore, no further effects on buried archaeology would occur during operation or decommissioning of the Project, and such effects have been scoped out of the assessment process.

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7.2 Landscape and Visual Resources

Introduction

7.2.1 This section of the Scoping Report identifies the landscape and visual resources and the receptors of relevance to the Project, and considers the potential impacts arising from the construction, operation and maintenance, and decommissioning of the solar farm upon those resources.

7.2.2 This section of the Scoping Report also sets out the proposed scope of the Landscape and Visual Impact Assessment (LVIA) and the methodology to be used in the assessment of landscape and visual effects of the solar farm.

Legislative and Policy Context

7.2.3 The following key legislation and policy documents relevant to landscape and visual matters will be considered within the assessment process:

- Council of Europe, European Landscape Convention (ratified 2006);
- Countryside and Rights of Way Act 2000;
- National Policy Statement for Energy EN-1 (and draft version);
- National Policy Statement for Renewable Energy Infrastructure EN-3 (and draft version);
- National Policy Statement for Electricity Network Infrastructure EN-5 (and draft version);
- Ministry of Housing, Communities and Local Government, National Planning Policy Framework (NPPF) (2021);
- Vale of White Horse Local Plan 2031 Part 1, Core Policy 44: Landscape;
- West Oxfordshire Local Plan 2031, Policy EH2: Landscape Character;
- Cherwell Local Plan 2011-2031 (incorporating re-adopted Policy Bicester 13), Policy ESD 13: Local Landscape Projection and Enhancement;
- Cumnor Parish (2021), Neighbourhood Plan;
- Woodstock Neighbourhood Plan (2023);
- Eynsham Neighbourhood Plan (2020)

Guidance Documents

- Landscape Institute and Institute of Environmental Management and Assessment (2013), Guidelines for Landscape and Visual Impact Assessment, 3rd Edition
- Landscape Institute (2021), Technical Guidance Note 02/21, Assessing Landscape Value Outside National Designations
- Landscape Institute (2019), Technical Guidance Note 06/19, Visual Representation of Development Proposals;
- Landscape Institute (2019), Technical Guidance Note 2/19, Residential Visual Amenity Assessment;
- Natural England (2014), An Approach to Landscape Character Assessment;
- Countryside Agency and Scottish Natural Heritage (2002), Landscape Character Assessment Guidance for England and Scotland;
- ICOMOS World Heritage Site
- LDA Design (2016), Renewable Energy and Low Carbon Energy Assessment and Strategy for West Oxfordshire.
- Vale of White Horse Council 2006) Vale of White Horse Landscape Strategy:
- Oxfordshire Wildlife and Landscape Study (OWLS) (2004), Oxfordshire County Council, English Nature, Countryside Agency and Northmoor Trust;
- Cherwell District Council (1998), Countryside Design Summary;
- West Oxfordshire Council (1998), West Oxfordshire Landscape Assessment;
- Morgan Sindall, Dorn Glyme Valley Woodland, Blenheim Estate;
- Oxford City Council, Oxford Preservation Trust and Historic England, Oxford View Cones Study (2015);
- Cotswolds AONB Partnership (2002), Cotswolds AONB Landscape Character Assessment

Study Area

7.2.4 The study area for the assessment of landscape and visual effects in the Environmental Statement (ES) ('the Landscape and Visual Study Area') will be informed by nature of the Project, incorporating up to 2.5 m high solar arrays, power converter station locations, project substation locations and the cable route corridor.

7.2.5 This will take into account the findings of an analysis of the ZTV of the solar farm assets (including any construction working areas) and the identification of representative viewpoints. Once the location of the assets has been identified, and the ZTV produced, representative viewpoints will be agreed with relevant stakeholders, including Local Authorities, and, where relevant, Areas of Outstanding Natural Beauty partnerships.

7.2.6 The 2.5 m high solar arrays of the Botley West Solar Farm, and dimensions of converter stations and project substations, are likely to form the basis of the Landscape and Visual Resources Study Area. The extent of the Study Area will be determined by the findings of

the ZTV and reviewed and refined if necessary. Taking into account the assets of the Botley West Solar Farm, the Study Area is likely to extend to a 5 km buffer from the other edge of the arrays in all directions.

Data Sources

7.2.7 The data sources used to inform the baseline assessment will be a combination of published material and site visits by competent experts. An initial desk-study will include the following data sources;

- Any published landscape character assessments (national, regional and local scale);
- Descriptions of international and national designated landscapes, including Cotswold Area of Outstanding Natural Beauty (AONB), publicly accessible Registered Parks and Gardens and where relevant locally designated landscapes such as Special Landscape Areas.
- Ordnance Survey 1:25,000 and rights of way mapping; and
- Aerial photography.

7.2.8 In addition, site visits will be undertaken to survey the solar array installation area and cable corridor and surrounding areas to verify the documented landscape and visual baseline and to select and take photographs from the agreed representative viewpoints of the solar array infrastructure.

7.2.9 The baseline data sources identified in this Scoping Report will remain under review and may be updated in respect of feedback from relevant statutory and non-statutory consultees during the LVIA process, or in response to new sources of information becoming available.

Baseline Environment

7.2.10 This section provides a high-level overview of the nationally designated landscapes within the Botley West Study Area. Not all the landscapes detailed below will be affected by the solar arrays. Those with theoretical visibility will be identified by generating ZTVs.

7.2.11 The 5 km Study Area for the solar arrays includes the following internationally and nationally designated landscapes: World Heritage Site (WHS) (Blenheim); Registered Park and Garden (RPG) Blenheim Park; Kirtlington Park; Rousham Park; Ditchley Park; Eynsham Hall Park; Oxford College Parks; and the Cotswolds AONB.

7.2.12 The location of statutory sites designated for their landscape characteristics/value in relation to the Botley West Solar Farm are presented in Figure 2. Including:

- Registered Parks and Gardens;
- CROW Access Lane; and
- Cotswolds Area of Outstanding Natural Beauty (AONB).

7.2.13 The landscape character of the Site extends over a broadly rolling agricultural landscape of the River Dorn, River Evenlode Valleys and eastern slopes to the River Thames. The landscape is generally characterised by a regular pattern of medium to large sized hedged fields dominated by arable farming, with areas of plantation and tree belts close to village

settlements and dispersed farmsteads. There are scattered hedgerow trees, including ash and oak, and willow and poplar fringing ditches and streams. Large blocks of ancient woodland are characteristic of the central section. The regional landscape types with specific landscape characteristics include:

Northern Section

- Wooded Estate lands; and
- Estate Farmlands;

Central Section

- Estate Farmlands
- Wooded Estatelands;
- River Meadowlands
- Lowland Village Farmlands; and
- Alluvial Lowlands;

Southern Section

- Vale Farmland; and
- Rolling Farmland

7.2.14 The baseline conditions set out in the ES will consider landscape and visual receptors, including the following:

- International designated sites;
- National designated landscapes;
- National and local landscape character areas, including designated landscape qualities;
- Residents, if there is a potential for such receptors to experience substantial adverse effects (a change in private views is not a planning matter unless receptors are likely to experience effects that are over and above substantial adverse);
- Users of Public Rights of Way (PRoW) and areas of Access Land;
- Other recreational users of land or water, such as those people involved in outdoor sports, including water sports and fishing;
- Tourists visiting specific destinations, including publicly accessible Registered Parks and Gardens and other historic assets; and
- Dynamic users of transport routes, including those people within motor vehicles as well as cyclists.

Consultation

7.2.15 Consultation will be undertaken with the Cotswold AONB Board as the ZTV is over a small part within the AONB boundary including a section of Wychwood Way. There are not expected to be any significant landscape character or visual effects due to intervening vegetation.

7.2.16 We will consult with the relevant local authorities to agree representative viewpoints to be taken forward for assessment.

Potential Project Impacts

7.2.17 A range of potential impacts on landscape and visual resources have been identified, which may occur during the construction, operation and maintenance, and decommissioning phases of the Project.

7.2.18 The assessment will consider two key areas:

- Landscape character (features, elements and characteristics): A review of the character of the site and its surroundings will be undertaken with reference to published landscape assessment documents and field survey, as well as individual landscape features and elements.
- Visual receptors: taking into account the findings of the site visits and field appraisal, a range of viewpoint locations will be identified and agreed with the relevant statutory consultees, that are considered representative of views towards the solar arrays from areas identified on the ZTV, including winter and summer photography (should the Project programme allow), from selected representative viewpoints, will be undertaken. An indicative ZTV along with representative viewpoints are included on Figure 7.

7.2.19 The impacts that have been scoped into the assessment are outlined in

7.2.20 Table 7.2 together with a description of any additional data collection (e.g. site-specific surveys) and supporting analyses that will be required to enable a full assessment of the impacts.

Table 7.2: Impacts proposed to be scoped into the project assessment off effects on landscape and visual resources and receptors (project phase refers to construction (C), operation and maintenance (O) and decommissioning (D).

Impact	Project phase			Justification	Data collection and analysis required to characterise the baseline environment	Summary of proposed approach to assessment
	C	O	D			
Potentially significant change in character (to landscape designations / types / areas) as a result of solar farm activity.	/	/	/	The construction of the Botley West Solar Farm could cause direct impacts upon landscape character.	Desktop analysis of landscape character with notes and contextual photography, confirmed and refined during site visits.	ZTV production will show where solar arrays may influence landscape character, including any character areas that they are not located within.
Potentially significant effects on publicly accessible views as a result of solar farm activity.	/	/	/	The construction of the Botley West Solar Farm could be visible to visual receptors, including: • Residents • People using public rights of way and Access Land • Dynamic receptors (e.g. users of roads and railways) • Land-based and water-based receptors engaged in recreational pursuits other than using public right of way (e.g. people playing golf or yachtsmen) • People at their place of work.	Desktop analysis of mapping with notes confirmed and refined during field work and photography.	ZTV production would show where the solar panels have the potential to be visible from. Representative viewpoints from publicly accessible locations would be agreed with statutory consultees and view from those locations assessed, as well as assessing more general views available by receptor groups. Where appropriate photomontages will be produced to illustrate the proposed Solar Farm.

Table 7.3:Impacts proposed to be scoped out of the project assessment for landscape and visual

Impact	Justification
Construction: Visualisations Night-time assessment Residential Visual Amenity Assessment Study area of 5 km radius from edge of site	 No visualisations of construction No permanent lighting is proposed No significant effects expected that would overwhelm existing properties nor render properties an unattractive place to live. No significant effects are expected for highest sensitivity receptors beyond 5 km from the site boundary. No ZTV required for cable route.
Operation:	

Impact	Justification
Night-time assessment Residential Visual Amenity Assessment Study area of 5 km radius from edge of site boundary	No permanent lighting is proposed No significant effects expected that would overwhelm existing properties nor render properties an unattractive place to live. No significant effects are expected for highest sensitivity receptors beyond 5 km from the site boundary.
Decommissioning: Visualisations Night-time assessment Residential Visual Amenity Assessment Study area of 5 km radium from edge of site	 No visualisations for decommissioning No permanent lighting proposed No significant effects expected that would overwhelm existing properties nor render properties an unattractive place to live. No significant effects are expected for highest sensitivity receptors beyond 5 km from the site boundary.

7.2.21 The following designed-in measures are relevant to landscape and visual resources and receptors. The designed-in measures will evolve over the development process as the EIA progresses.

7.2.22 A key designed-in mitigation would be the siting of the solar array installation areas. This will include avoidance of important landscape features and elements where practicable, including existing hedgerows and trees.

7.2.23 As part of the design process for the solar farm, designed-in measures are proposed to avoid or reduce landscape and visual impacts on sensitive resources and receptors. Designed-in measures relevant to landscape and visual resources and receptors would include:

- Development of a Landscape Master Plan or Landscape Strategy Plan, primarily in relation to the landscape proposals across the site, but also to reinstate hedgerows through which the cable corridor passes;
- Code of Construction Practice (CoCP), including control of temporary lighting and reinstatement of temporary earthworks associated with the cable corridor and any temporary construction works areas; and
- Decommissioning Plan.

7.2.24 The requirement for and feasibility of any mitigation measures will be consulted upon with statutory consultees throughout the EIA process.

Proposed assessment methodology

7.2.25 The principal objectives of the assessment will be:

- To identify the existing landscape and visual resources and receptors that might be affected by the Botley West Solar Farm.
- To assess the significance of the effects on landscape and visual resources and receptors, taking into account the measures proposed to mitigate any of the potential impacts identified.

7.2.26 The assessment will be undertaken based on recognised guidelines, principally the *Guidelines for Landscape and Visual Impact Assessment, Third Edition* (GlVIA3), (Landscape Institute and Institute of Environmental Management and Assessment, 2013).

7.2.27 The assessment will consider the likely significant effects of the Botley West Solar Farm upon:

- Individual landscape features, elements and characteristics;
- Landscape character; and
- Visual receptors (people) for whom the solar farm infrastructure might be visible during the different phases of the project.

7.2.28 As set out in GLVIA3, landscape and visual effects will be assessed separately, although the procedure for assessing each of these is closely linked. A clear distinction will be drawn between landscape and visual effects as described below:

- Landscape effects relate to the effects of the Botley West Solar Farm on the physical and other characteristics of the landscape and its resulting character and quality; and
- Visual effects relate to the impacts on publicly available views experienced by visual receptors (e.g. footpath users, tourists) and on the visual effects experienced by those people.

7.2.29 The short-term effects of the construction and decommissioning phases and the long-term effects relating to the operation and maintenance phase will be assessed. ZTVs will be generated to show the theoretical extent of visibility of the Botley West Solar Farm within the Landscape and Visual Study Area.

7.2.30 Consideration will be given to the likely seasonal variations in the visibility of the Project, including variations in weather conditions and deciduous vegetation. Consideration will also be given to changes in the level of effects likely to take place as new planting, proposed as part of the Botley West Solar Farm matures, and existing vegetation continues to grow.

7.2.31 The assessment process will follow the approach set out in GLVIA3, with regard to identification of resource and receptor sensitivity (susceptibility and value), impact magnitude and evaluation of significance of effects.

7.2.32 The sensitivity of landscape and visual resources and receptors will be identified, together with the predicted magnitude of impact on that resource or receptor. Taking this into account, the significance of effect will be described for each resource or receptor during the construction, operational and decommissioning phases, and upon maturity of landscape planting, where relevant (up to 10 years of establishment).

7.2.33 The evaluation of significance will be underpinned by a narrative approach, based on professional judgement.

Potential cumulative impacts

7.2.34 In accordance with GLVIA3, the types of cumulative effect that would be considered include:

- Effects of extension to an existing development;
- Filling an area with the same development or different types of development over time;
- Interactions between different types of development;
- Incremental change as a result of successive individual development;

- Temporal effects;
- Indirect effects of development such as enabling other development; and
- Future actions that remove elements which may have consequences for other existing or proposed development.

7.2.35 Any construction, operation and maintenance or decommissioning activities of the Botley West Solar Farm that coincide with the landscape and visual resources study area of any phases of proposed development (e.g. large infrastructure developments, large residential developments, large areas of commercial development, pipeline or cable routes) would be considered in the cumulative effects assessment.

7.2.36 Any potential cumulative impacts on the landscape and visual resource or receptor which may arise from the construction, operation and maintenance and decommissioning of the West Botley Solar Farm alongside the activities of other projects will be described.

Potential inter-related effects

7.2.37 Any potential inter-related effects on landscape and visual resources or receptors which may arise from the construction, operation and maintenance and decommissioning of the West Botley Solar Farm with other topic areas will be described.

Assumptions and Limitations

7.2.38 The visual assessment would be based on the analysis of OS mapping of the site and surrounding area, and on field survey and analysis of representative views towards the site from publicly accessible viewpoints in the surrounding landscape. Although every effort will be made to include viewpoints in sensitive locations and locations from which the project would be most visible, not all public viewpoints from which the project would potentially be seen can necessarily be included in the assessment. Where impacts to residential or other private views (e.g. commercial occupiers) are noted, these will necessarily be estimated and professional judgement used.

7.2.39 The visual assessment will be undertaken on the basis of the worst-case winter year 1 situation and after mitigation has matured at the summer year 10 situation. The intention is for winter and summer photography to be taken to represent seasonal changes.

References

Landscape Institute and the Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, Third Edition.

7.3 Ecology and Nature Conservation

Introduction

7.3.1 This section of the scoping report covers ecology and nature conservation.

Relevant Policy, Legislation and Guidance

7.3.2 The following key legislation and policy documents relevant to ecology and nature conservation will be considered within the assessment process:

- The Conservation of Habitats and Species Regulations 2017 as amended;
- Regulation 5(2)(b) of the EIA Regulations 2017;
- Directive 92/43/EEC (the Habitats Directive);
- Directive 2009/147/EC (the Birds Directive);
- Wildlife and Countryside Act 1981 (as amended);
- Environment Act 2021
- Countryside and Rights of Way Act 2000;
- The Natural Environment and Rural Communities Act 2006 (as amended);
- The Wild Mammals (Protection) Act 1996;
- Protection of Badgers Act 1992;
- Energy NPS EN-1 (DECC, 2011 and draft);
- Energy NPS EN-3 (DECC, 2011 and draft);
- NPPF (MHCLG, 2021);
- West Oxfordshire District Council Local Plan 2011-2031 Policy EH3: Biodiversity and Geodiversity;
- West Oxfordshire District Council Local Plan 2011-2031 Policy EH4: Public Realm and Green Infrastructure;
- Cherwell District Council Adopted Cherwell Local Plan 2011-2031 (Part 1) Policy ESD10 Protection and Enhancement of Biodiversity and the Natural Environment;
- Cherwell District Council Adopted Cherwell Local Plan 2011-2031 (Part 1) Policy ESD17 Green Infrastructure;
- Vale of White Horse District Council: Local Plan Part 1 Core Policy 45: Green Infrastructure; and
- Vale of White Horse District Council: Local Plan Part 1 Core Policy 46: Conservation and Improvement of Biodiversity.

7.3.3 The assessment for ecological effects for the ES chapter will be undertaken in accordance with the ecological impact assessment guidelines published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2022). The effect of the Project on European designated sites will be assessed following the method set out in the Planning Inspectorate Advice Note Ten: Habitats Regulations Assessment Relevant to Nationally Significant Infrastructure Projects (Planning Inspectorate, 2022). This will be presented either as a No Significant Effects Report or (if Appropriate Assessment is required following screening) as a Habitats Regulations Assessment Report (in accordance with the Conservation of Habitats and Species Regulations 2017, as amended which transpose the

requirements in the Habitats Directive (92/43/EEC) and the European Birds Directive (2009/147/EC) into UK law.

7.3.4 Surveys will be undertaken in accordance with best practice guidance relevant to each survey type.

Baseline Information

Data Collated to Date

7.3.5 This section forms a summary of the data collated to date.

7.3.6 Data with respect to statutory designated sites have been collected from the MAGIC website (www.magic.defra.gov.uk). This provides the current boundaries for such sites. The locations of, and boundaries for, Ancient Woodland have also been obtained from the MAGIC website.

7.3.7 The surrounding areas have been subject to various ecology studies in the past, with an emphasis on bat species and populations in Wytham Woods and Blenheim Park by the University of Oxford. The University have also carried out research on badger setts near the Site boundary.

7.3.8 Based on a review of the available desk study information, surveys have commenced, including:

- Phase 1 habitat survey;
- Great crested newts;
- Terrestrial invertebrates;
- Foraging/commuting bats;
- Roosting bats;
- Reptiles;
- Badgers;
- Breeding birds; and
- Botanical interest.

Existing Baseline Conditions

7.3.9 Part of the Southern Project Site (Denman's Farm) is a Conservation Target Area (CTA) – Oxford Heights West. Other areas of the Project Site are directly bordered by designated sites of nature conservation interest, including; Ancient Woodland, CTA, Oxfordshire Local Wildlife Sites and Sites of Special Scientific Interest (SSSI). The initial Site boundary and statutory and non-statutory sites are presented in Figure 5.

7.3.10 A number of statutory and non-statutory designated sites are within 5 km of the Site boundary.

7.3.11 Data with respect to locally designated sites within 5 km of the Site has been requested from Thames Valley Environmental Records Centre (TVERC) and will be included within the PEIR. Additionally, following industry best practice, records of protected or otherwise

notable species have also been requested from the records centres and will be included within the PEIR.

7.3.12 Much of the land within the Site boundary comprises agricultural fields bounded by hedgerows of varying quality. Habitats also include grasslands of varying quality. Habitats adjacent to the boundary include blocks of woodland (including several parcels of Ancient Woodland)- Bladon Heath, Burleigh Wood, Pinsley Wood.

7.3.13 One main watercourse flows through the Site:

- The River Evenlode runs through the centre of the Site. It flows south-east from the River Glyme at Bladon and into the River Thames.

7.3.14 Surveys to date (both historic and ongoing) have identified populations of the following fauna of conservation interest:

- Great Crested Newts;
- Range of breeding birds in various status;
- Signs of badger and badger setts across the site;
- Commuting/foraging bats;
- Trees within the boundary with varying levels of bat roost potential;
- Reptile assemblage;
- Terrestrial invertebrate assemblage; and
- Otter signs

7.3.15 These surveys will be continued, as necessary, through the 2023 survey season.

7.3.16 Consultation will be undertaken with Natural England via their Discretionary Advice Service.

Proposed Scope of the Assessment

7.3.17 It is proposed that the findings of the assessment of effects of ecology and nature conservation would be set out as a topic within the ES, supported by technical appendices where appropriate. The PEIR will include a draft chapter, including as much of the information set out below as is available at the time of writing.

Proposed scope of Baseline Studies

7.3.18 The desk study results, including details of protected species records, designated sites and the results of the Phase 1 Habitat survey will be present within a Preliminary Ecological Appraisal (PEA), which will form an appendix to the PEIR/ES.

7.3.19 As set out above, a number of surveys are currently being undertaken on site including:

- Great crested newts;
- Terrestrial invertebrates;
- Bat activity (foraging/commuting) via static monitoring;
- Bat roosting;

- Reptiles;
- Breeding birds;
- Non-breeding birds;
- Aquatic mammals (otter & water vole);
- Botanical interest (NVC/BNG);
- Aquatic invertebrates; and
- Fish.

Study Area

7.3.20 An initial search area of 5 km for statutory sites (SSSIs, National Nature Reserves (NNRs), and 2km for non-statutory sites (Local Wildlife Sites LWS, CTAs) has been used for the data search to allow for effects arising from works at the Site and effects arising from changes to surface access arrangements. An initial 5 km buffer is considered appropriate since this recognises that effects due to surface access arrangements during construction may occur at some distance from the Site.

7.3.21 Records of protected or otherwise notable species have been requested from the local records centres within a 2 km radius of the Site boundary, except for bats where a larger 10 km radius has been used in accordance with guidance from the Bat Conservation Trust.

7.3.22 The survey area for the majority of surveys will be within the Site boundary. However, it is recognised that effects on ecological receptors can occur beyond such limits, especially for mobile species such as great crested newt. Therefore, the survey area will include, as necessary, water bodies within 500 m outwith the site boundary if they are considered to support this species. The survey area will also include up to 500 m both up and down stream of the major watercourses that flow through the Site to identify any potential sign of otter/water vole.

Effects Proposed to be Assessed

7.3.23 Based upon the information collated to date, the designated sites shown on Figure 5 are likely to be Important Ecological Features (IEFs) requiring detailed assessment.

7.3.24 In addition, locally designated sites will be included where an impact pathway can be identified.

7.3.25 Habitats that will be assessed as IEFs include:

- Ancient Woodland (both on site and in the surrounding landscape);
- Other areas of mature broadleaved woodland;
- Species-rich grasslands;
- Various onsite and offsite ponds;
- Water courses, including the Evenlode; and
- Hedgerows and associated field boundaries.

7.3.26 Fauna that will be assessed as IEFs include:

- Great crested newt;
- Bat assemblage;
- Terrestrial invertebrate assemblage;
- Grass snake;
- Breeding bird assemblage; and
- Water vole & otter

7.3.27 In the event that surveys identify other features of ecological value, these will be considered for inclusion within the assessment

Table 7.3: Potential Effects to be Considered: Ecology and Nature Conservation

Construction Phase (including decommissioning): Ecology and Nature Conservation	
Activity	**Potential Effects**
Construction and demolition activities	Effects on designated sites and habitats (set out above) as a result of construction activity including habitat severance and loss of ecological connectivity, habitat disturbance (e.g. light, noise pollution/ introduction of toxic pollutants), changes to water quality and changes in air quality (emissions from traffic and dust). Effects on species valued as important features of designated sites.
	Effects on habitats (set out above) as a result of construction activity (e.g. habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (e.g. dust, light, noise pollution/ introduction of toxic pollutants), through changes to air and water quality.
	Effects on species as a result of construction activity within Site boundary (e.g. direct killing or injuring of fauna, disturbance and displacement of species (particularly to those sensitive to noise and light disturbance), introduction or spread of invasive species, changes to water quality).
Use of construction compounds and creation of mitigation areas	Effects on habitats as a result of use of construction compounds and creation of mitigation areas beyond the Site boundary (e.g. habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (e.g. dust, light, noise pollution/ introduction of toxic pollutants), introduction or spread of invasive species (in particular along the River Evenlode and surrounding land), changes to air/water quality).
	Effects on species as a result of use of construction compounds and creation of mitigation areas beyond the Site boundary (e.g. direct killing or injuring of fauna, disturbance and displacement of species (particularly to those sensitive to noise and light disturbance), introduction or spread of invasive species)
Operational Phase: Ecology and Nature Conservation	
	Effects on habitats as a result of operational activity (e.g. habitat loss, habitat severance and loss of ecological connectivity)
	Effects on species as a result of operational activity (including light and noise) (e.g. direct killing or injuring of fauna, disturbance and displacement of species (particularly to those sensitive of habitat disturbance), introduction or spread of invasive species.

Approach to Assessment of Effects

7.3.28 The ecological assessment will include an evaluation of the IEFs on the site and surrounding area, which may include protected sites, protected species, priority habitats and priority species. The evaluation will identify features on a geographical scale, based on that provided in CIEEM guidance, as follows: International > National > County > District > Local > Site > Negligible.

7.3.29 In accordance with the CIEEM guidance, the purpose of the ecological assessment is to focus on those features that are most likely to be affected and are either protected or are of sufficient value to merit the consideration in the EIA process rather than consider the

effects upon every feature that may be present, many of which will be common, widespread and robust. Accordingly, those features that are likely to be affected and which are statutorily protected, or are deemed to be of at least local nature conservation value, or are agreed to be worthy of consideration in consultation with consultees will be taken forward for detailed assessment.

7.3.30 The likely impacts of the Project will be identified, including likely positive and negative impacts on the IEFs present. Such impacts may include direct habitat loss, changes in habitat quality or disturbance, for example through changes in lighting or noise.

7.3.31 The likely magnitude of the impacts will be assessed during the construction and operational stages. Both the magnitude of the predicted impact and the value of the feature will be taken into consideration in determining the significance of the effect.

7.3.32 The assessment will follow an approach by identification of receptor sensitivity (value), impact magnitude and evaluation of significance of effects. The terms used to describe the receptor sensitivity take into account their geographical scale, based on that provided in the CIEEM guidance.

7.3.33 The evaluation of significance will be underpinned through the use of a narrative approach, based on professional judgement.

Approach to Mitigation, Monitoring and Enhancement

7.3.34 Mitigation will be determined based on the outcome of the assessment of effects. The EIA process is iterative and opportunities will therefore be sought to avoid impacts arising and to incorporate measures to avoid or reduce impacts into the design of the Project.

7.3.35 At this stage, mitigation is likely to include (but not be limited to):

- Avoidance of designation sites, areas of known habitat value or areas supporting protected species, where practicable;
- Replacement habitat for that lost where such habitat is either of conservation significance in its own right or supports a protected or otherwise notable species. For example, any loss of scrub/tree lines around the fire training area could be mitigated through new planting in appropriate locations. The management of such habitats will be described within a suitable management plan; and
- Protection of habitats during construction activities from pollution/ disturbance etc through adoption of CoCP and subsequent CEMP.

7.3.36 Further mitigation, such as the provision of new commuting routes for bats or new foraging habitat for birds, specific plots for skylark etc. may also be incorporated, based on the findings of the assessment as required.

7.3.37 Although not mandatory for projects consented under the NSIP regime, in order to demonstrate that the Project will deliver Biodiversity Net Gain, the Department for Environment Food and Rural Affairs (Defra) Biodiversity Metric will be used. In consultation with Natural England and other appropriate stakeholders, this uses a weighted calculation comparing the before- and after-development biodiversity value.

Issues Proposed to be Scoped Out

7.3.38 Based on the desk study and the site surveys, the following are proposed to be scoped out of the EIA process:

- Direct habitat loss effects within the boundary of designated sites (no habitat loss would occur within any of the identified designated sites, at European, national or local level). Therefore, no impact pathway would exist because the project has been specifically designed to avoid such areas.

REFERENCES

Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) Guidelines for Ecological Impact Assessment. [Online] Available at: https://cieem.net/wp-content/uploads/2019/02/Combined-EcIA-guidelines-2018-compressed.pdf

Planning Inspectorate (2017c) Advice Note Ten: Habitats Regulations Assessment Relevant to Nationally Significant Infrastructure Projects. [Online] Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/06/Advice-note-10v4.pdf

7.4 Hydrology and Flood Risk

Introduction

7.4.1 The aim of this section of the scoping report is to outline the potential hydrological and flood risk issues affecting the site and implications for future development. The feasibility of the proposed use is assessed, potential mitigation measures or requirements for additional work are identified, where appropriate.

Relevant Policy, Legislation, and Guidance

7.4.2 The following key legislation and policy documents relevant to hydrology and flood risk will be considered within the assessment process:

European Legislation

- The European Water Framework Directive (2000)
- Flood Directive (2007)
- Drinking Water Directive (2015)

National Legislation

- The Water Resources Act (1991)
- The Land Drainage Act (1991)
- The Environment Act (1995)
- The Water Act (2003)

- The Groundwater (England and Wales) Regulations (2009)
- Flood Risk Regulations (2009)
- The Flood and Water Management Act (2010)
- The Water Act (2014)
- Environmental Permitting (2016)
- Reservoirs Act (1975)

National Policy

- National Planning Policy Framework (NPPF)
- Planning Policy Guidance (PPG)

Local policy

- West Oxfordshire Local Plan 2031
- Vale of White Horse District Council Local Plan 2031
- Cherwell Local Plan 2011 – 2031
- Local Standards and Guidance For Surface Water Drainage On Major Development In Oxfordshire – December 2021

Relevant guidance

- National Highways et al (2020) Design Manual for Roads and Bridges (DMRB) LA113 Road drainage and the water environment;
- National Highways et al (2020) Design Manual for Roads and Bridges (DMRB) LA104 Environmental assessment and monitoring;
- Non-statutory technical standards for sustainable drainage systems (Defra, 2015); and
- Report C753: The SuDS manual (CIRIA, 2015).

Study Area

7.4.3 The hydrology and flood risk study area to be used for the assessment focuses on where potential impacts are most likely to occur on hydrological and flood risk receptors. As such, the hydrology and flood risk study area includes:

- The area of land to be temporarily or permanently occupied during the construction, operation and maintenance and decommissioning of the Project.
- Surface water receptors and flood risk receptors located within 250m of the cable corridor, temporary compounds, solar PV array land parcels and secondary substations. The 250m study area is considered appropriate for data collection taking into account the likely zone of influence by hydrological receptors. The area has also been chosen to identify any existing receptors, assets or infrastructure that have the potential to be affected by temporary flood risk as a result of the Project.

- Flood risk receptors located within 1km of the new National Grid 400kV substation. The 1km buffer was chosen primarily to identify any existing receptors, assets or infrastructure that have the potential to be affected by flood risk as a result of the Project.

Baseline Data

7.4.4 An initial desk-based review of literature and data sources, to support this Scoping Report, has highlighted the following sources of baseline data which provide coverage of the new solar farm site area:

- AECOM (November 2016) West Oxfordshire District Council Strategic Flood Risk Assessment SFRA update report.
- British Geological Society (BGS) Online database (2022).
- Climate data (Met Office, 2022).
- EA Catchment Data Explorer (Defra Data Services Platform, November 2022); and
- EA Flood Map for Planning (November 2022);
- EA (December 2015) Part 1: Thames river basin, district river basin management plan Updated.
- Magic Maps – Defra (November, 2022).
- The Centre for Ecology and Hydrology (CEH) website (2022);

7.4.5 In addition to the above data sources, site-specific hydrological data will be obtained via consultation with the Environment Agency, Lead Local Flood Authority, Envirocheck/Groundsure and site reconnaissance.

Baseline Environment

Hydrological Setting

7.4.6 An initial review of published OS maps and Environment Agency data shows that the Project search area includes the following Main Rivers/designated watercourse features:

Northern Site

- River Glyme

Central Site

- River Glyme
- River Evenlode
- Rowel Brook
- River Thames Tributary

Southern Site

- Filchampstead Brook
- River Thames Tributary

7.4.7 In addition to the above, the three solar farm sites include a network of ordinary watercourses, streams, drains and waterbodies.

Cable Corridor

- River Evenlode
- Chill Brook
- River Thames

7.4.8 In addition to the above, the cable corridor crosses a network of ordinary watercourses, streams, drains and waterbodies.

Water Framework Directive

7.4.9 Under the Water Framework Directive (WFD), hydrological features often contribute either directly or indirectly to the overall framework designation. Hydrological designations within the solar farm site area are provided at an international and national level.

7.4.10 Further details on the designated sites within the West Botley Solar Farm area are provided in Table 7.4.

Table 7.4: Water Framework Directive Classification

Catchment	Solar Farm Section	River Name/watercourse feature	Classification
Evenlode Operational Catchment	Northern Section, cable corridor	Glyme (Dorn confluence to Evenlode) Water Body	Poor Ecological Status
Cherwell Operational Catchment	Northern Section, cable corridor	Cherwell (Bletchingdon to Ray) Water Body	Moderate Ecological Status
Evenlode Operational Catchment	Central Section, cable corridor	Evenlode (Glyme to Thames) Water Body	Poor Ecological Status
Ock Operational Catchment	Central Section, cable corridor	Thames (Evenlode to Thame) Water Body	Moderate Ecological Status
Windrush Operational Catchment	Southern Section, cable corridor	Filchhampstead Brook at Farmoor Water Body	Bad Ecological Status

Designated Sites

7.4.11 There are several Designated sites located within the study area, including:

- Blenheim Park SSSI
- Wytham Woods SSSI

7.4.12 No Special Protection Areas (SPA) Special Areas of Conservation (SAC) are located within the Project study areas.

7.4.13 Relevant hydrology and flood risk designations are presented below within Table 7.5.

Table 7.5: Designations within the West Botley Solar Farm search area relevant to hydrology and flood risk.

Site	Closest distance to West Botley Solar Farm	Features
Regional Designations		
Flood Zones		
Northern Section	The section is mainly located within Flood Zone 1. Where the unnamed watercourse crosses the section, there is an area of Flood Zone 3. This appears to be confined to its channel.	**Flood Zone 1** - land assessed as having a less 0.1% annual probability of river or sea flooding. **Flood Zone 2** - land assessed as having between 1% – 0.1% annual probability of river flooding, or between a 0.5% – 0.1% annual probability of sea flooding in any year. **Flood Zone 3** - land assessed as having >1% annual probability of river flooding, or a 0.5% or greater annual probability of flooding from the sea in any year.
Central Section	Majority of the section is located within Flood Zone 1. Where the Evenlode crosses the Central section there are areas of Flood Zone 3 associated with its floodplain.	
Southern Section	Majority of the section is located within Flood Zone 1. A small area in the north-east of the site lies within Flood Zone 2 and 3, which is associated with the floodplain of an unnamed river crossing.	
Cable corridor	corridor between northern and central section is located within Flood Zone 1. The corridor between the central and southern section is predominantly located within Flood Zone 2 with smaller areas of Flood Zone 1 and 3.	

7.4.14 Figure 3 presents the current EA flood zones.

Potential Project Impacts

7.4.15 A range of likely effects on hydrology and flood risk have been identified which may occur during the construction, operation and maintenance, and decommissioning phases of the development of West Botley Solar Farm.

7.4.16 The impacts that have been scoped into the West Botley Solar Farm site assessment are outlined in Table 7.6, together with a description together with a description of any additional data collection (e.g. site-specific surveys) and/or supporting analyses (e.g. modelling) that will be required to enable a full assessments of the potential impacts.

Table 7.6: Impacts proposed to be scoped into West Botley Solar Farm assessment for hydrology and flood risk.

Impact No.	Impact	Justification	Data Collection and analysis required to characterise the baseline environment
Construction			
1	Potential increase to flood risk	The construction could directly impact flood risk on adjoining land.	A desk based study of the flood risk within all of the West Botley Solar Farm sites. Specific modelling is proposed to be undertaken to inform this assessment.
2	Potential to increase temporary flood risk.	Impacts in flood risk could arise from any change in run-off areas affected during construction compound and temporary areas.	A desk based study of the flood risk within all of the West Botley Solar Farm sites. Specific modelling is proposed to be undertaken to inform this assessment
4	Deterioration of water quality in 'Main Rivers'.	Direct impacts to water quality may occur from construction works in close proximity to watercourses.	A review of the EA catchment data explorer to identify the WFD classification of watercourses within the study areas.
5	Deterioration of water quality of ordinary surface watercourses.	Direct impacts to the water quality as a result, temporary access roads crossing a number of ordinary watercourses and drains	A review of the EA catchment data explorer to identify the WFD classification of watercourses within the study areas.
6	Damage to field drainage and infrastructure	The solar farm site is located in a predominantly rural location.	The location of field drainage would be established (where possible) through consultations with landowners.
7	Damage to water pipeline infrastructure.	Water supply pipelines may be located within the sites, which could be damaged by construction activities, such as the implementation of cables.	A desk based study would be undertaken to establish the locations if the water pipes on the sites to see if they would be affected.
Operation and Maintenance			
8	Deterioration of water quality of Main Rivers	Indirect impacts may occur as a result of leakage of stored materials or spilled materials used during operation and maintenance.	A desk-based study of Main Rivers in particular, the chemical and biological objectives set by the WFD.
9	Deterioration of water quality of ordinary watercourses	Indirect impacts may occur as a result of leakage of stored materials or spilled materials used during operation and maintenance.	A desk-based study of Main Rivers in particular, the chemical and biological objectives set by the WFD.
10	Potential increase in flood risk	A desk based study of the food risk area within the three sites, looking at the inverters and DNO buildings.	Specific modelling is proposed to be undertaken to inform this assessment A conceptual drainage strategy is to be undertaken for the substation as part of the FRA to ensure any increases in impermeable area do not increase flood risk.
Decommissioning			
11	Potential increase to flood risk	The decommissioning could directly impact flood risk on adjoining land.	A desk based study of the flood risk within all of the West Botley Solar Farm sites. Specific modelling is proposed to be undertaken to inform this assessment.

Impact No.	Impact	Justification	Data Collection and analysis required to characterise the baseline environment
12	Potential to increase temporary flood risk.	Impacts in flood risk could arise from any change in run-off areas affected during decommissioning of compounds and temporary areas.	A desk based study of the flood risk within all of the West Botley Solar Farm sites. Specific modelling is proposed to be undertaken to inform this assessment
13	Deterioration of water quality of Main Rivers	Direct impacts to water quality may occur from workings associated to the removal of cabling and associated infrastructure.	A desk-based study of Main Rivers in particular, the chemical and biological objectives set by the WFD.
14	Deterioration of water quality of ordinary watercourses and drains.	Direct impacts to water quality may occur from workings associated to the removal of cabling and associated infrastructure.	A desk-based study of Main Rivers in particular, the chemical and biological objectives set by the WFD.

Measures adopted as part of the project

7.4.17 Measures adopted as part of the project will include:

- Development of, and adherence to, a Surface Water Management Plan;
- Preparation of a Flood Risk Assessment and drainage strategy due to the overall size of the site being in excess of 1 ha, to accompany the planning application;
- Development of a detailed 1D – 2D hydraulic model based on the watercourse, cross section survey. The model will produce a more accurate representation of potential flood extents on the sites and impact of climate change;
- Development of, and adherence to the Code Construction Practice (CoCP);
- Development of, and adherence to, battery storage units and electricity substations and handling procedures. Department for Business, Energy & Industrial Strategy (September 2020), Domestic Battery Energy Storage Systems, A review of Safety Risks BEIS Research Paper Number 2020/037;
- Development of, and adherence to, a Decommissioning Plan;
- Due to some areas of the sites being in the vicinity of within Flood Zones 2 or 3, it would be recommended that the PV arrays, electricity sub-station, battery storage units and other building elements of the solar farm will be, where practicable, kept out of the surface water flood extents associated with these flow paths and will be set back by at least 8m from them Main River and ordinary watercourses; and
- Height of PV arrays to be increased to ensure underside of panel is located above the 1 in 100 (plus climate change) flood level.

7.4.18 The requirement and feasibility of additional measures will be dependent on the significant effects on hydrology and flood risk.

Potential Cumulative Impacts

7.4.19 Cumulative impacts from hydrology and flood risk arising from the Botley West Solar Farm, alongside other projects within hydrology and flood risk study areas from other industries/activities, would be likely to occur during the construction, operation and maintenance and decommissioning phases.

7.4.20 The predicted effects of construction, operation and maintenance, and decommissioning from Botley West Solar Farm are considered to be localised within the footprint of each of the three sites for the project. However, there is potential for cumulative effects to occur from other projects or activities within the hydrology and flood risk study area where projects or plans could act collectively with the Botley West Solar Farm to affect sensitive receptors.

7.4.21 The following projects will be considered within the hydrology and flood risk study area:

- Roads and rail projects; and
- Major residential, commercial and leisure projects.

7.5 Ground Conditions

Introduction

7.5.1 This section of the EIA Scoping Report covers ground conditions, including land and groundwater contamination, ground instability and minerals resources.

7.5.2 In terms of land and groundwater contamination an assessment is required to determine the nature and extent of effects on human health and controlled waters that may result from the Project with regard to the ground conditions known to be present across the Project Site. Assessment will also be made to determine effects on human health and the environment from potential ground instability as well as the potential for sterilising mineral resources.

7.5.3 This section will consider potential impacts arising from the construction, operation and maintenance, and decommissioning phases of the Project and identifies the proposed scope and scale of the EIA for ground conditions.

Relevant Policy, Legislation and Guidance

7.5.4 The following key legislation, guidance and planning policy that is relevant to geology and ground conditions will be considered within the assessment process;

National

- DEFRA Environmental Protection Act 1990: Part 2A - Contaminated Land Statutory Guidance (2012);
- Environment Agency (2020) Land Contamination: Risk Management (LCRM 2020);
- National Planning Policy Framework (2021);
- National Planning Practice Guidance (2021);

- British Standard requirements for the 'Investigation of potentially contaminated sites - Code of practice' (ref. BS10175:2011+A1:2017);
- British Standard requirement for 'Soil quality - conceptual site models for potentially contaminated sites' (ref. BS EN ISO 21365:2020);
  - Water Resources Act (1991);
  - The Contaminated Land (England) Regulations (2006);
  - Environmental Damage (Prevention and Remediation) (England) Regulations (2015);
- Water Supply (Water Quality) Regulations (2016);
- Environmental Permitting (England and Wales) Regulations (2016);
  - Water Environment (Water Framework Directive) Regulations (2017);
- National Policy Statement for Energy EN-1 (and draft version) - Section 5.3 (2011);
- National Policy Statement for Electricity Network Infrastructure EN-5 (and draft version) - Section 2.7 (2011);

Local

- Cherwell District Council Adopted Cherwell Local Plan 2011-2031 (Part 1) Policy ESD8 Water Resources;
- Cherwell District Council Adopted Cherwell Local Plan 2011-2031 (Part 1) Policy ESD10 Protection and Enhancement of Biodiversity and the Natural Environment;
  - Oxfordshire County Council Minerals and Waste Local Plan (2021).
- West Oxfordshire District Council Local Plan 2011-2031 Policy EH8: Environmental Protection;
  - Vale of White Horse District Council: Brownfield Register (March 2023); and
  - Vale of White Horse District Council: Local Plan 2031, Part 1 Core Policy 43: Natural Resources;

Study Area

7.5.5 The study area for this topic comprises the Site and a data search buffer of up to 100 m. This enables the identification of both on-site and off-site sources of potential contamination and other factors which may influence ground conditions at the Site. The inclusion or otherwise of relevant sensitive sources and receptors gives due consideration to the following;

- The nature of the Project which would not typically include occupied buildings, therefore the risk from ground gases (including radon) is considered low. Potential ground gas sources are therefore restricted to features located within or adjacent to the Site.
- Pollution incidents classified as having a 'major' impact on land or water.
- Active groundwater / surface water abstractions.

7.5.6 In order to provide sufficient detail for this scoping assessment, the three main sections of the Site have been sub-divided into fourteen land parcels (referenced as Land Parcels 01 – 14 on Fig 4b). It is assumed the cable route, where it exits the three main Project Sites, follows existing public highways except for the Swinford Toll Bridge area between the Central and Southern section's where further evaluation of route options will be required.

7.5.7 The preliminary corridors for the proposed cable routes, as identified in the Site Boundary (Order Limits) Plan, vary in width in places, due to the options still being considered. The cable route connecting the main site areas will predominantly follow the line of the public highway, and the Order Limits Plan has been refined at various locations to avoid private property. The cable route corridors are identified as follows;

- Botley North to Botley Central: Preliminary route follows across fields to the east of Woodstock joining the A44 Oxford Road to the south-east of Woodstock linking Areas 4 and 6 (Land Parcel 15 of Fig 4b).
- Botley Central to Botley South: Preliminary Route mainly follows the B4449 to the east of Eynsham and B4044 Oxford/Eynsham Road linking Areas 13 and 14 (Land Parcel 16 of Fig 4b).

7.5.8 The cable route in the vicinity of the Swinford Toll Bridge, crossing the River Thames, has yet to be established and additional data searches will be required to complete the scoping assessment for this area.

Baseline Environment

7.5.9 The baseline environment for bedrock and superficial deposits are covered within Section 7.11: Agricultural Land & Soils below. This baseline will therefore focus upon evidence of potential land contamination, risk of ground instability and location in relation to identified Local Authority registered mineral sites/safeguarding zones for each of the land parcels and the main cable routes.

7.5.10 Approximately 2 km to the north of the of the northern parcel of Site there is a designated Mineral Safeguarding Zone: Soft sand with an area of crushed rock located to the west of this. Moving south, the western section of the Central parcel is underlain by a Mineral Safeguarding Zone of sharp sand and gravel. This area of sharp sand and gravel also runs under the very southern section of the Central part of the Site in a west to east orientation and encroaches into a small section of the eastern section of the Central parcel. The same Mineral Safeguarding Zone of sharp sand and gravel is located on the opposite side of Farmoor Reservoir to the southern part of the Site. However, the southern parcel is not underlain by any Mineral Safeguarding Zone.

7.5.11 There are no permitted waste sites within the Site boundary. The closest permitted waste sites are located in Witney, Ardley and Abingdon.

Potential Project Impacts

7.5.12 The Project may impact on ground conditions during, construction, operation and/or decommissioning phases.

7.5.13 The proposed construction activities have the potential to mobilise contaminants associated with historical contaminative land use, through the creation of new migration

pathways. Groundwater flow patterns and drainage patterns may also be impacted by the operational phase of the Project modifying existing pathways and consequently having potential significant effects on sensitive receptors currently unaffected by contamination sources that may be present.

7.5.14 During construction and operational phases there is the potential risk of ground instability as a result of construction disturbance, for example promoting landslips/landslides through slope destabilisation or triggering of potentially unstable natural solution features through vibration in construction or loading or changes of drainage patterns during operation.

- Historic contamination information and other background information has been collected for the Site which we sub-divided into numbered land parcels for ease of description. The land parcel maps are shown at Figure 4b.

7.5.15 It has been established that there are six land parcels and also part of the proposed cable route corridor that fall within areas designated as mineral consultation/safeguarding areas. These are primarily within the boundaries of West Oxfordshire District Council and relate to potential reserves of sand and gravel aggregate. Within the Botley Central Area the identified mineral consultation/safeguarding areas also extend within Cherwell District Council.

7.5.16 Potential impacts relating to land contamination, ground instability or mineral resources scoped in or scoped out of the need for further assessment are identified in the individual land parcels depicted in Figure 4b in the Appendix, and summarised in Table 7.7 below (scoped in (tick) or out (cross)).

Table 7.7: Scoping Assessment Summary

Land Parcel	Land Contamination	Ground Instability	Mineral Resources
01	×	×	×
02	✓	×	×
03	✓	×	×
04	✓	×	×
05	✓	×	×
06	✓	✓	×
07	✓	✓	✓
08	✓	✓	✓
09	✓	✓	✓
10	×	×	✓
11	✓	✓	×
12	✓	✓	✓
13	✓	✓	✓
14	✓	✓	×
15 (cable route)	✓	✓	×
16 (cable route)	✓	✓	✓

Mitigation Measures to be Adopted as Part of the Project

7.5.17 Any areas of previously unknown contamination not identified by the completed baseline survey would require appropriate management during the construction phase to avoid risk to construction workers. Mitigation measures for protection of site workers from soil/groundwater contamination or ground gases would typically be included in a Construction Environmental Management Plan (CEMP) drawn up by the contractors. At the application stage, we will provide an Outline Code of Construction Practice with the Environmental Statement which will set out the principles of good practice that will be adhered to during construction.

7.5.18 The requirement for and feasibility of any further mitigation measures will be dependent on the significance of effects and will be reviewed throughout the EIA process. At this stage it is anticipated that these may include slope stability assessments, mineral resource assessments and environmental sampling of soils, groundwater or ground gas where it cannot be demonstrated by desk-based preliminary risk assessment that there is a low risk of contamination.

Proposed Assessment Methodology

7.5.19 For land parcels scoped in as requiring ES assessment for ground conditions, there will be an assessment of the likely significant effects from the construction, operation and decommissioning of the Project on controlled waters receptors (groundwater and surface water), human health receptors (construction workers, site operatives or neighbouring land users), safeguarded mineral reserves and land instability issues that may arise.

Assessment Process

7.5.20 The baseline conditions within the Project Site area will be further informed through a series of assessments for land contamination, ground instability and possible impact on viable mineral reserves.

7.5.21 The baseline conditions for these land parcels will be further developed through further detailed assessment and preparation of a Conceptual Site Model following the source-pathway-receptor linkage approach as recommended in the key land contamination documents above. The following assessment process shall be adopted for the risk assessment and determination of significance of effects;

- Completion of a Desk Study and Preliminary Risk Assessment (DTS & PRA) for each of the land parcels that have been scoped in for ES assessment as detailed in Table 1-1.
- Completion of a Minerals Resource Assessment for the land parcels within registered mineral sites/safeguarding zones utilising the findings of the DTS & PRA and regulatory correspondence with the local authority Minerals Officer at Oxfordshire County Council;
- Clarification of the Study Area to include the Swinford Toll Bridge locality and any changes that may occur in the existing extent and area of the land parcels forming the Botley West Solar Farm;
- Definition of the baseline conditions based upon the DTS & PRA;

- Definition of the sensitivity of receptors; and
- Qualitative assessment of the significance of effects on the basis of the magnitude of effect and the sensitivity of receptor.

7.5.22 Where there are requirements for additional ground investigation to be undertaken to adequately define the baseline conditions for any of the land parcels then this will be identified early in the assessment process and a suitable scope of works determined and undertaken.

Sensitivity of Potential Receptor

7.5.23 The sensitivity of potential receptors will be qualitatively described and categorised based upon the terminology in Table 7.8 below. Professional judgement / opinion has been used to provide examples of receptors and their likely sensitivities.

Table 7.8: Receptor Sensitivity Criteria

Sensitivity	Typical Descriptors	Examples
High	High importance and rarity, and limited potential for substitution	On site future users through chronic exposure to contamination; Principal Aquifer with licensed groundwater abstractions; Excellent quality surface water bodies; Excellent quality economically extractable mineral resource
Medium	Medium importance and rarity, and limited potential for substitution	Off-site users; Secondary A Aquifer; Good quality surface water bodies; Good quality economically extractable mineral resource
Low	Low importance and rarity	Secondary B Aquifer; Secondary Undifferentiated Aquifer; satisfactory quality surface water bodies; Mineral resource present but unlikely to be economically viable for extraction
Negligible	Very low importance and rarity	Unproductive Strata; poor quality surface water bodies; Mineral Resource not present or not of sufficient quality or quantity to be economically viable

Magnitude of Potential Impact

7.5.24 The magnitude of potential impacts will be qualitatively described and categorised based on the terminology in Table 7.9.

Table 7.9: Impact Magnitude Criteria

Magnitude	Criteria	Examples
High	Results in loss of attribute and likely to cause exceedance of statutory objectives and / or breaches of legislation	Category 1 – Soil contamination that could result in a 'contaminated land' designation under Part 2A, i.e. significant possibility of significant harm to human health or controlled waters. Or A change of planning use deems that the concentrations of contaminants in the land may be harmful to receptors. Remedial Action under Part 2A will be required

Magnitude	Criteria	Examples
		Or Large scale landslides or ground destabilisation across a wide area.
Medium	Results in impact on integrity of attribute or loss of part of attribute possibly with / without exceedance of Statutory objectives or with / without breaches in legislation	Category 2 – Soil contamination that could provide a strong case for considering that the risks are of significant concern so as to be designated as 'contaminated land' designation under Part 2A. Or A change of planning use deems that the concentrations of contaminants in the land may be harmful to receptors. Remedial Action under Part 2A will be required on a precautionary basis. Or Moderate scale landslides or ground destabilisation within a localised area.
Low	Results in minor impact on attribute	Category 3 – Soil contamination could arise but the concentrations would not be considered significant or there is a low likelihood of serious pollution. Or A change of planning use deems that the concentrations of contaminants in the land are not capable of harming receptors. It is unlikely that remedial action will be required, however land owners may consider remedial actions to reduce contamination outside of the Part 2A or planning regime. Or Small scale localised landslides/ground destabilisation.
Negligible	Results in no discernible change or an impact on attribute of insufficient magnitude to affect the use / integrity	Category 4 – Soil contaminants present, but risk assessment suggests negligible / low risk to human health. Or Very limited or no landslides.

Assessment of Effects

7.5.25 The significance of likely effects during construction, operation and decommissioning of the Project will be determined from the predicted magnitude of an impact and the sensitivity of the receptor using the matrix provided in Table 7.10 below.

Table 7.10: Assessment of Effects

Sensitivity	Magnitude of Impact			
	Negligible	**Low**	**Medium**	**High**
Negligible	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	Negligible or Minor	Minor	Moderate	Moderate or Major
High	Minor	Minor or Moderate	Moderate or Major	Major

Potential Cumulative Effects

7.5.26 The effects of the Botley West Solar Farm development with other schemes that are under construction, consented or for which planning permissions are currently being sought will be assessed within the EIA where appropriate. The assessment will consider potential contamination within other sites and mineral extraction proposals to evaluate potential risks and significance of effects posed by these developments. Following the assessment any

identified requirements for remediation or prior extraction to complete ongoing mineral extraction schemes should be completed prior to start of the construction phase.

7.6 Traffic and Transport

Introduction

7.6.1 This section of the EIA Scoping Report sets out how the traffic and transport receptors relevant to the Botley West Solar Farm will be identified and the proposed approach to assessment. This section also considers the potential impacts arising from the construction, operation and maintenance, and decommissioning of the Botley West Solar Farm, and identifies the proposed scope and scale of the EIA for traffic and transport.

7.6.2 A Transport Statement will be prepared to support the EIA process. The Transport Statement and the EIA would utilise the same baseline data, however, the Transport Statement will be prepared in accordance with its own relevant guidance and best practice and will be subject to a separate scoping exercise with the relevant highway authorities. It will focus on the operational capacity of the highway network and the impact upon the operation and performance of key highway links and junctions.

Study Area

7.6.3 The study area for the assessment of traffic and transport (the traffic and transport study area) will focus on areas where potential impacts are most likely to occur. This includes areas located near construction sites and access routes, the Local Road Network (LRN) and Strategic Road Network (SRN) to be used by construction traffic, and will be defined using the ‘Rule 1’ and ‘Rule 2’ methodology set out below.

7.6.4 In using this methodology, the traffic and transport study area will also include all accesses (whether temporary or permanent) and/or any road improvements required to facilitate the construction of the Botley West Solar Farm.

7.6.5 The access arrangements, access routes and the forecast construction traffic demand along the LRN and SRN is not yet known and so the traffic and transport study area cannot be defined at this time. Once these elements are confirmed, the traffic and transport study area can be defined and agreement will be sought with the relevant highway authorities.

Baseline Environment

7.6.6 The traffic and transport assessment will consider the potential impact of the Botley West Solar Farm on receptors sensitive to changes in traffic located within the traffic and transport study area.

7.6.7 Effects will be assessed on users of the LRN, SRN, PRoWs and other active or promoted travel routes.

7.6.8 Receptors will be used to determine the sensitivity of highway links as part of the baseline environment, for example:

- People located at home or within the workplace, including sensitive groups such as children, the elderly and the disabled;

- Hospitals, churches, schools or historical buildings;
- Recreational resources, including public open spaces, shopping areas and tourist attractions;
- Sites designated for nature conservation.

Highway Network

7.6.9 The A34 forms part of the SRN and is located on the eastern side of the Botley West Solar Farm, routeing broadly north to south between the M40 and the M4 / M3 respectively (in a local context).

7.6.10 There are several 'A' classification roads in proximity to the Northern, Central and Southern site areas that form part of the LRN and which can be accessed from the A34.

7.6.11 The A4260 Banbury Road routes broadly north to south along the eastern side of the Northern site area and connects to the A34 at the Peartree Interchange.

7.6.12 The A44 Oxford Road routes broadly north-west to south-east to the south of the Northern site area and to the north of the Central site area and also connects to the A34 at the Peartree Interchange.

7.6.13 The A40 Eynsham Road routes broadly east to west to the South of the Central site area and connects to the A34 at the Peartree Interchange via the A44.

7.6.14 The A420 Faringdon Road routes broadly north to south along the eastern side of the Southern site area and connects to the A34 at the Botley Interchange.

7.6.15 Other roads surrounding the Botley West Solar Farm are of a lower classification and provide access to local areas.

Other Transport Receptors

7.6.16 There are three National Cycle Network routes that are in close proximity to the Botley West Solar Farm. These include:

- Route 5, which routes broadly north-west to south-east between the Northern and Central site areas and then through the Northern site area;
- Route 51, which routes broadly south-west to north-east on the eastern side of the Northern site area; and
- Route 442, which routes broadly north-west to south-east on the western side of the Central site area.

7.6.17 There are several PRoWs located within and surrounding the Botley West Solar Farm.

7.6.18 There are several built up and urban areas adjacent to the Botley West Solar Farm. Within each of these urban areas there are a range of sensitive receptors, all of which will be identified and considered as part of the baseline environment.

Future Baseline Conditions

7.6.19 The EIA process will consider the existing baseline conditions within the traffic and transport study area and the future baseline conditions (as far as reasonably practicable)

from the application of traffic growth rates and considerations to any committed developments or committed transport interventions, to be agreed with the highway authorities

7.6.20 The EIA will also consider the opportunity and benefits that might arise from improved connectivity and active travel changes that could result from the scheme. This will also have an interrelationship with the Health, Socio-Economic and Land Use chapters, and cumulative effects.

Potential Project Impacts

7.6.21 A range of potential impacts on traffic and transport have been identified which may occur during the construction, operation and maintenance and decommissioning phases of the Botley West Solar Farm.

7.6.22 The impacts that have been scoped into the assessment are outlined in Table 7.11 together with a description of any data collection and supporting analyses that will be required to enable a full assessment of the impacts.

7.6.23 There may be a requirement for new junctions to access construction works areas. The Transport Statement will assess the impacts of traffic flow and safety at all such new junctions in terms of their operational performance.

7.6.24 Potential impacts scoped out of the assessment are presented in Table 7.12 with justification for why the impact should be scoped out.

Table 7.11: Impacts proposed to be scoped into the assessment for traffic and transport (project phase refers to construction (C), operation and maintenance (O) and decommissioning (D))

Impact	Project phase			Justification	Data collection and analysis required to characterise the baseline environment	Summary of proposed approach to assessment
	C	O	D			
The impact of increases in traffic flows as a result of construction traffic or works due to, for example, cable trenching, upon driver and pedestrian delay and pedestrian amenity for users of the LRN and SRN.	✓	×	×	Additional vehicle movements or works required to facilitate construction of the Botley West Solar Farm may impact the effective operation of the LRN, SRN and other transport receptors (e.g., PRoWs) and cause driver and pedestrian delay/impact on pedestrian amenity.	The LRN, SRN and other transport receptors located within the traffic and transport study area will be identified using desk-based analysis. Records of existing public transport services will be obtained from the relevant public transport service operators. Existing traffic flow information for the LRN and SRN, including automatic traffic counts and manual classified counts, will be obtained from the local and national highway authorities. In addition, existing traffic data will be supplemented by further site-specific surveys, if required. The scope of any site-specific surveys will be agreed with the local and	The type, number, frequency and assignment of additional vehicle movements on the LRN and SRN generated during construction of the Botley West Solar Farm will be predicted using first principles, from an understanding of the construction process, likely material quantities and construction programme. The location of any crossings or cable trenching within any local roads will be identified. Where predicted traffic flows within the traffic and transport study area exceed Rule 1 and Rule 2 of the Guidance for Environmental Assessment of Road Traffic (IEMA, 1993), or where any cable trenching would be within a local road, the impact of these upon driver and pedestrian delay, pedestrian amenity,
The impact of increases in traffic flows as a result of constructuon traffic or works due to, for example, cable trenching,upon community severance for users of the LRN and SRN.	✓	×	×	Additional vehicle movements or works required to facilitate construction of the Botley West Solar Farm could limit the mobility/access of users of the LRN, SRN and other transport receptors (e.g., PRoW), causing severance between communities (including community facilities).		
The impact of temporary delays to	✓	×	×	Construction of the Botley West Solar Farm may		

Impact	Project phase			Justification	Data collection and analysis required to characterise the baseline environment	Summary of proposed approach to assessment
	C	O	D			
public transport services caused by increases in traffic flows as a result of construction traffic or works due to, for example, cable trenching.				disrupt public transport services (e.g., buses) due to the construction works themselves or additional vehicles movements causing delays.	national highway authorities. These baseline data sources will be discussed with the Local Highway Authority and National Highways to enable a single baseline year and future reference year scenarios to be created on an agreed basis.	community severance and public transport services for users of the LRN and SRN will be assessed in accordance with Guidance for Environmental Assessment of Road Traffic (IEMA, 1993). The impact of additional vehicle movements upon the effective operation and performance of key highway links and junctions of the LRN and SRN (jn terms of highway capacity) will be assessed in a separate Transport Statement (to be submitted alongside the ES), which will undergo an independent scoping process in consultation with the local and national highway authorities. Assessments will be undertaken in accordance with Planning Practice Guidance: Travel Plans, Transport Assessments and Statements (MHCLG, 2014), Guidance for Environmental Assessment of Road Traffic (IEMA, 1993) and DMRB LA104: Environmental Assessment and Monitoring (Highways England, Transport Scotland, Welsh Government and Department for Infrastructure Northern Ireland, 2020).
The impact of increases in traffic flows as a result of construction traffic or works due to, for example, cable trenching,upon accidents and safety for users of the LRN, SRN and other transport receptors.	✓	×	×	Additional vehicle movements required to facilitate construction of the Botley West Solar Farm could impact the safety of users of the LRN, SRN and other transport receptors (e.g., PRoW).	The LRN, SRN and other transport receptors located within the traffic and transport study area will be identified using desk-based analysis. Personal Injury Accident data for the LRN and SRN will be obtained using a combination of Crash Map and records held by the Local Highway Authority.	The type, number, frequency and assignment of additional vehicle movements on the LRN and SRN generated during construction of the Botley West Solar Farm will be predicted using first principles, from an understanding of the construction process, likely material quantities and construction programme. An analysis of Personal Injury Accident data, including CrashMap, will be undertaken to identify locations on the LRN and SRN which exhibit concentrations of collisions with similar patterns or collisions rates above the national average.

Impact	Project phase			Justification	Data collection and analysis required to characterise the baseline environment	Summary of proposed approach to assessment
	C	O	D			
						These locations on the LRN and SRN will be considered as receptors sensitive to changes in traffic flows and will be subject to further detailed impact assessment. The impact of these additional vehicle movements on accidents and safety for users of the LRN and SRN will be assessed in accordance with Guidance for Environmental Assessment of Road Traffic (IEMA, 1993), in addition to the application of professional judgement where required.
The impact of Abnormal Indivisible Loads (AILs) on the safety of users of the LRN, SRN and other transport receptors.	✓	×	×	Construction of the Botley West Solar Farm may require the transportation of AILs, which may impact the safety of users of the LRN, SRN and other transport receptors (e.g., PRoW).	The LRN, SRN and other transport receptors located within the initial traffic and transport study area will be identified using desk-based analysis.	Once the route(s) for AILs has been identified, a qualitative assessment of the impact of AILs on accidents and the safety of users of the LRN, SRN and other transport receptors will be undertaken using professional judgement where required. This will comprise analysis to identify sections of the highway network which may require modifications to facilitate the transport of AILs to the construction site.

Table 7.12: Impacts proposed to be scoped out of the project assessment for traffic and transport

Impact	Justification
The impact of additional vehicle movements on the LRN and SRN on driver and pedestrian delay, pedestrian amenity, community severance, public transport delay and accidents and safety during operation and maintenance of the Botley West Solar Farm.	Operation and maintenance of the Botley West Solar Farm is likely to generate a limited number of additional vehicle movements on the LRN and SRN. The Botley West Solar Farm does not require any manned facilities and requires only infrequent maintenance activities. Therefore, the potential impact of additional vehicle movements on the LRN, SRN and other transport receptors during operation and maintenance of the Botley West Solar Farm is unlikely to result in significant effects and is proposed to be scoped out of the assessment for traffic and transport.
The impact of additional vehicle movements on the LRN and SRN on driver and pedestrian delay, pedestrian amenity, community severance, public transport delay and accidents and safety during decommissioning of the Botley West Solar Farm.	Decommissioning of the Botley West Solar Farm will generate a lower number of additional vehicle movements on the LRN and SRN than the construction phase. This is because retired infrastructure/ equipment will either be left in situ or transported away from site in bulk, reducing the number of additional vehicle movements required to facilitate decommissioning of the Botley West Solar Farm. In addition, measures to be included in the Construction Traffic Management Plan, updated as necessary, will also be employed during the decommissioning phase. Therefore, the potential impact of additional vehicle movements on the LRN, SRN and other transport receptors during decommissioning of the Botley West Solar Farm based upon future year baseline conditions that could be estimated at this time would be no higher than those impacts during the construction

Impact	Justification
	phase. Becuase construction effects are assumed to be a worst case, it is proposed that a separate decommissioning transport assessment be scoped out.

Measures Adopted as Part of the Project

7.6.25 The following measures adopted as part of the project are relevant to traffic and transport. These measures may evolve as the engineering design and the EIA progresses.

- Construction Traffic Management Plan (CTMP) – The movement of construction vehicles entering or exiting construction sites and utilising the LRN and SRN would be controlled, as to avoid or reduce potential impacts on sensitive receptors.

7.6.26 The requirement for and feasibility of any mitigation measures will be dependent on the significance of effects and will be consulted upon with statutory and non-statutory consultees throughout the EIA process.

7.6.27 Requirements for any additional mitigation measures will be determined through discussions with the relevant authorities and interested parties likely to be affected as part of the traffic and transport assessment.

Proposed Assessment Methodology

7.6.28 Additional vehicle movements generated during construction of the Botley West Solar Farm will be determined using first principles, from an understanding of the construction process, likely material quantities and construction programme as the design progresses.

7.6.29 A detailed analysis of the LRN and SRN will then be undertaken to identify key locations where potential traffic and transport impacts may occur. This analysis will identify road network constraints and inform the access strategy for construction related vehicles (i.e., types, numbers, frequency and timings).

7.6.30 The access strategy to be utilised during the construction of the Botley West Solar Farm will be consulted and agreed upon with the local and national highways authorities.

7.6.31 The traffic and transport assessment will predict the traffic flows generated on the LRN and SRN during the construction of the Botley West Solar Farm using first principles, from an understanding of the construction process, likely material quantities and construction programme. These predicted traffic flows will be assessed against forecast baseline traffic data to determine if an impact is likely to occur. The scope and duration of predicted impacts will be quantified for each phase of the construction programme.

7.6.32 In addition, the ES will include an outline of the proposed construction compounds, which will be further developed as the design progresses, to indicate the potential size and broad spread of construction compounds that are likely to be required.

7.6.33 The traffic and transport assessment will be based on the following legislation, policy and guidance:

- National Policy Statement for Energy, 2011 (NPS EN-1);
- National Policy Statement for Renewable Energy Infrastructure, 2011 (NPS EN-3);
- National Planning Policy Framework, 2021 (NPPF);

- Planning Practice Guidance 'Travel Plans, Transport Assessments and Statements', 2014 (PPG);
- West Oxfordshire District Council Local Plan 2011-2031;
- Cherwell District Council Adopted Cherwell Local Plan 2011-2031;
- Vale of White Horse District Council Local Plan 2031;
- Guidelines for the Environmental Assessment of Road Traffic Guidance Note No. 1 (IEMA, 1993);
- Planning Practice Guidance: Travel Plans, Transport Assessments and Statements (Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government, 2014); and
- DMRB LA104: Environmental Assessment and Monitoring (Highways England, Transport Scotland, Welsh Government and Department for Infrastructure Northern Ireland, 2020).

Assessment Process

7.6.34 In terms of the assessment of the environmental impacts of traffic, the IEMA guidelines states that the following two 'rules' should be followed:

- Rule 1 – Include highway links where traffic flows will increase by more than 30% or where the number of Heavy Good Vehicles (HGVs) will increase by more than 30%.
- Rule 2 – Include any other specifically sensitive areas where traffic flows have increased by 10% or more.

7.6.35 The assessment will therefore identify the sensitivity of affected transport routes, taking into account the presence and location of sensitive receptors or route users. The determination of receptor sensitivity will be based on the criteria of value, adaptability and tolerance. Sensitivity will be categorised using professional judgement following the principles set out in Table 7.13.

Table 7.13: Definitions of Sensitivity

Sensitivity	Typical Descriptors
High	Those receptors with greatest sensitivity due to site-specific characteristics which make them particularly sensitive to changes in traffic flow including schools, colleges, playgrounds, accident black spots (with reference to accident data and Personal Injury Accident (PIA) rates being above the national average), retirement homes, urban/residential/built-up roads without commensurate footway provision, high footfall, severley congested junctions.
Medium	Receptors of medium sensitivity to traffic flows including congested junctions, doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, unsegregated cycleways, community centres, parks, recreation facilities, roads with PIA rates close to the national average.
Low	Receptors with some sensitivity to traffic flows including places of worship, public open space, nature conservation areas, listed buildings, tourist attractions, urban/residential/built-up areas with good footway provision commensurate for its use and footfall and other receptors with low sensitivity to traffic flows and those sufficiently distant from affected roads and junctions.

7.6.36 Rules 1 and 2 are used as a screening tool to determine whether or not a full assessment of effects is required for any identified highway link. Highway links which are identified as

low or medium sensitivity will be considered against the Rule 1 threshold. Highway links which are identified as high sensitivity will be considered against the Rule 2 threshold. Where predicted changes in traffic flow fall beneath these levels, a full assessment of effects will not be required and no significant effects upon that highway link will occur.

7.6.37 Consistent with the IEMA guidelines, the following will be considered within the traffic and transport assessment:

- Driver delay;
- Severance of routes;
- Pedestrian delay;
- Pedestrian amenity;
- Accidents and road safety; and
- Abnormal Indivisible Loads.

7.6.38 Paragraph 4.5 of the IEMA guidelines recognises that professional judgement should be used as part of the assessment and states the following:

'For many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact as well as the assessment of the damage to various natural resources'.

7.6.39 Based upon the advice contained within the IEMA guidelines, Table 7.14 sets out the considerations for defining the magnitude of change.

Table 7.14: Magnitude of Change

Sensitivity	Negligible	Low	Medium	High
Driver Delay	Defined in conjunction with the Transport Statement and a review of the change in operation of a junction or highway link with a particular focus on the weekday peak hour periods when baseline traffic flows are at their highest			
Severance	Change in total traffic flow of less than 30%	Change in total traffic flow of 30% to 60%	Change in total traffic flow of 60% to 90%	Change in total traffic flows of over 90%
Pedestrian Delay	Defined from a review of baseline traffic flows, pedestrian infrastructure and a guide (as set out in the IEMA Guidelines) that a 10 second pedestrian delay in crossing a road is considered to be perceptible or considered significant which broadly equates to a two-way traffic flow of approximately 1,400 vehicle movements per hour			
Pedestrian Amenity	Change in traffic flow (or HGV component) less than 100%		Change in traffic flow (or HGV component) more than 100%	
Accidents and Road Safety	Defined from a review of PIA data along highway links and the predicted changes in traffic flow			
Abnormal Indivisible Loads	Defined by an assessment of the suitability of the access routes to accommodate Abnormal Indivisble Loads			

Potential Cumulative Effects

7.6.40 There is potential for cumulative effects on sensitive receptors to occur when the construction of the Botley West Solar Farm is considered together with other developments. The potential cumulative effects between the construction of the Botley West Solar Farm and other developments with respect to traffic and transport will be considered within the ES.

7.6.41 Other emerging developments that are predicted to generate traffic within the traffic and transport study area during construction of the Botley West Solar Farm, which may contribute to a cumulative effect, will be identified in the cumulative effect assessment.

7.6.42 Other development proposals that emerge at the same time will be treated together and will be cumulatively assessed against the baseline scenario to determine their cumulative effect and any cumulative highway and transport mitigation requirements (if required).

Potential Inter-Related Effects

7.6.43 Noise, vibration and air emissions generated by additional vehicle movements on the LRN and SRN during construction of the Botley West Solar Farm may impact sites designated for conservation and protected habitats and species within the traffic and transport study area.

7.6.44 Access to recreational resources may be disrupted by additional vehicle movements on the LRN and SRN during construction of the Botley West Solar Farm.

7.6.45 Additional vehicle movements generated during construction of the Botley West Solar Farm will be used to identify areas within the noise and vibration study area which require further detailed noise and vibration assessment.

7.6.46 Additional vehicle movements generated during construction of the Botley West Solar Farm will be used to identify areas within the air quality study area which require further detailed air quality assessment, if the traffic generated exceeds the threshold for air quality assessment.

7.6.47 Effects of dust generated during construction of the Botley West Solar Farm will be considered in the detailed air quality assessment.

7.6.48 Additional vehicle movements generated during construction of the Botley West Solar Farm will be used to identify areas within the human health study area which require further detailed assessment

7.7 Noise and Vibration

Introduction

7.7.1 This section of the EIA Scoping Report relates to noise and vibration. The section summarises:

- the relevant legislation and guidance pertinent to the noise and vibration impact assessment;

- the relevant study areas and identification of the noise and vibration sensitive receptors;
- discussions of the baseline acoustic environment based on a desktop review of the area using OS mapping, existing plans and current layouts;
- the proposed assessment approach and methodology;

Legislation and Guidance

7.7.2 The following legislation and guidance are relevant to the noise and vibration impact assessments:

- Control of Pollution Act 1974 (CoPA)
  - Section 60, Part III of CoPA
  - Section 61, Part III of CoPA
  - Section 71, Part III of CoPA
  - Section 72, Part III of CoPA
- Environmental Protection Act 1990 (EPA)
  - Section 79, Part III of EPA
  - Section 82, Part III of EPA
- National Planning Policy Framework 2021 (NPPF)
- Noise Policy Statement for England 2010 (NPSE)
- National Policy Statement for Energy (NPS EN-1)
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3)
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5)
- Planning Practice Guidance – Noise 2019 (PPG-N)
- West Oxfordshire District Council Local Plan 2011-2031
- Cherwell District Council Adopted Cherwell Local Plan 2011-2031
- Vale of White Horse District Council Local Plan 2031
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (British Standards Institution, 2014).
- BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (British Standards Institution, 2014).
- BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (British Standards Institution, 2019).
- BS 7385-2:1993 – ‘Evaluation and measurement of vibration in buildings – Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings’ (British Standards Institution, 1993)
- Design Manual for Roads and Bridges LA111 – Noise and Vibration (DMRB LA111)

Study Area

7.7.3 Botley West Solar Farm is located within the administrative areas of Cherwell, West Oxfordshire and The Vale of White Horse Districts. The three main Project Sites (North, Central and South) will be connected via 220 kV underground cables. These 220 kV cables are required to connect all Project Sites with the main substation on the southern site called Botley West.

7.7.4 The noise and vibration study area has been defined as:

- For construction noise and vibration:
  - Areas where noise sensitive receptors are located within 300 m of the proposed Site, which includes locations of the construction compounds
  - Areas where noise sensitive receptors are located within 300 m of the cabling route corridors.
  - Areas where vibration sensitive receptors are located within 100 m from construction areas.
- For operation noise:
  - Areas where noise sensitive receptors are located within 1 km of the proposed Botley West Project Site.
  - Areas where noise sensitive receptors are located within 1 km of the Substation location.

Baseline Acoustic Environment

7.7.5 The three parts of the Site (North, Central and South) are located in a rural location with the majority of the surrounding land being either agricultural or woodland. The villages of Woodstock, Long Hanborough, Kidlington, and Eynsham are surrounding the site locations.

7.7.6 The North site is bordered by the A44 to the west, A4260 to the east and Woodstock to the south. The B4027 cuts through the site.

7.7.7 The Central site is bordered by the A44 to the east, A4095 to the north, Oxford Airport to the north-east, Long Hanborough to the west, and Eynsham to the south along with the A40. The trainline from London towards Worcester cuts through the site.

7.7.8 The South site is bordered by the A420 to the south/south-east and the Farmoor Reservoir to the west/north-west. The majority of the surrounding areas are agricultural land.

7.7.9 The existing baseline acoustic environment is therefore considered likely to be generally quiet and dominated by natural sounds and road traffic noise from the surrounding road networks, specifically the A44, A4260, B4027, A4095, A40, B449, A34, A420 and B4044. Some noise from aircrafts travelling to and from Oxford Airport would also be expected for the northern site location.

7.7.10 In the event that the proposed Botley West project does not progress, the future baseline acoustic environment would likely be similar to the existing acoustic environment, with the potential of slightly lower levels due to a reduction in road traffic noise. However, it is not anticipated that the future baseline acoustic environment would change significantly.

Proposed Approach and Assessment Methodology

7.7.11 A baseline sound survey would be undertaken to quantify the existing acoustic environment at the relevant noise sensitive receptors identified as likely to be affected by noise arising from the construction and operation of the Project. Locations for the baseline sound monitoring would be discussed and agreed with the appropriate Environmental Health Officer at the relevant Local Planning Authorities.

7.7.12 Based on the initial desk-based review of the site locations, it is considered unlikely that significant existing sources of vibration are located in the vicinity of the site locations and nearest noise and vibration sensitive receptors. As such, a baselines vibration survey should not be required.

7.7.13 The noise and vibration assessments would consider the following impacts:

- noise and vibration from construction activities;
- noise from the operation of the development; and
- noise from construction and operational phase traffic, if applicable.

Assessment of Impacts

7.7.14 The noise and vibration impact assessments will follow the methodologies outlined within the following guidance documents:

- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (British Standards Institution, 2014).
- BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (British Standards Institution, 2014).
- BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (British Standards Institution, 2019).
- BS 7385-2:1993 – 'Evaluation and measurement of vibration in buildings – Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings' (British Standards Institution, 1993)
- Design Manual for Roads and Bridges LA111 – Noise and Vibration (DMRB LA111)

7.7.15 The construction of the Project may result in noise and vibration impacts on the noise and vibration sensitive receptors within the proposed study area. An assessment of construction noise and vibration impacts would be undertaken in accordance with the guidance contained within BS 5228:2009+A1:2014: "Code of Practice for Noise and Vibration Control on Construction and Open sites, Part 1: Noise and Part 2: Vibration".

7.7.16 The available detail on anticipated construction working areas, phases, methods, and plant/equipment will be summarised in relation to noise and vibration, and a qualitative assessment of likely compliance with the derived assessment criteria will be undertaken. In the event that the exact construction details are not known at the time of preparing the PEIR/EIA Report, assumptions will be made and confirmed with the project team based on professional judgement and experience of similar developments.

7.7.17 The operation of the Project may result in noise impacts on the noise sensitive receptors within the study area. An assessment of operational noise impacts from plant and

equipment associated with the Project would be carried out in accordance with the guidance contained within BS 4142:2014+A1:2019 “Methods for Rating and Assessing Industrial and Commercial Sound”.

7.7.18 An assessment of potential noise impacts arising from any changes in traffic flows as a result of the construction and operation of the project will also be undertaken where applicable.

7.7.19 Where necessary, appropriate levels of mitigation would be identified, in accordance with best practice, to ensure that noise and vibration levels are acceptable during the construction and operation phases.

Topics Proposed to be Scoped Out

7.7.20 Based on the initial desk-based review of the site locations and surrounding areas there are unlikely to be significant existing sources of vibration in the vicinity of the Site and closest noise and vibration sensitive receptors. As such, a baseline vibration survey should not be required.

7.7.21 Operation of the Project is not likely to produce substantial levels of vibration since vibration is likely to be controlled at the source as part of the plant design since vibration isolation measures will be included as part of the plant design. Therefore, it is proposed to scope out an assessment of vibration impacts during the operational phase.

7.7.22 Noise and vibration impacts during decommissioning are likely to be similar or less significant than the impacts during construction. Therefore, a separate assessment of decommissioning impacts should not be required.

7.7.23 Only noise and vibration impacts on human receptors would be provided within the Noise and Vibration PEIR/EIA Report. Noise and vibration impacts on ecology would be considered within the Ecology chapter of the PEIR/EIA Report based on input from the measured noise and vibration data, calculations, and assessment results.

7.8 Climate Change

Introduction

7.8.1 This section of the Scoping Report considers the assessment of potential impacts on and due to climate change. Climate change here is considered in terms of the impact of greenhouse gas (GHG) emissions caused directly or indirectly by the Project, which contribute to climate change. The potential impact of changes in climate to the Project, which could affect it directly or could modify its other environmental impacts, are proposed to be scoped out of the assessment, with the exception of the likely changes to cloud cover over its expected lifetime (explained in greater detail in Paragraph 7.8.21).

Legislation

7.8.2 The Climate Change Act 2008, as amended (2019), created a framework for setting a series of interim national carbon budgets and plans for national adaptation to climate risks. The Act requires the UK government to set carbon budgets for the whole of the UK.

7.8.3 At present, the Third, Fourth, Fifth and Sixth Carbon Budgets, set through The Carbon Budget Orders 2009, 2011, 2016, and 2021 are 2.54 giga tonnes carbon dioxide equivalent (GtCO2e) for 2018-2022, 1.95 $GtCO_2e$ for 2023-2027, 1.73 $GtCO_2e$ for 2028-2032 and 0.97 $GtCO_2e$ for 2033-2037 respectively. The Sixth Carbon Budget is the first Carbon Budget that is consistent with the UK's net zero target, requiring a 78% reduction in GHG emissions by 2035 from 1990 levels.

7.8.4 The UK's Nationally Determined Contribution (NDC) (HM Government, 2020) under the Paris Agreement to the United Nations Framework Convention on Climate Change (UNFCCC), submitted in December 2020, commits the UK to reducing economy-wide GHG emissions by at least 68% by 2030, compared to 1990 levels.

Guidance

7.8.5 The main guidance used for the assessment of GHG emissions in EIA is the Institute of Environmental Management and Assessment (IEMA) guide 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' (IEMA, 2022).

- the Greenhouse Gas Protocol suite of documents (World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), 2004);
- Valuation of Energy Use and Greenhouse Gas: Supplementary guidance to the HM Treasury Green Book (BEIS, 2022); and
- UK Government GHG Conversion Factors for Company Reporting (BEIS and Department for Environment, Food and Rural Affairs (Defra), 2022).

Study Area

7.8.6 GHG emissions have a global effect rather than directly affecting any specific local receptor. The impact of GHG emissions occurring due to the Project on the global atmospheric concentration of the relevant GHGs, expressed in CO_2e, is therefore considered within this assessment.

7.8.7 The climate change risk study area is the climate projections 25 km grid cell in which the Project Site is located.

Baseline Information

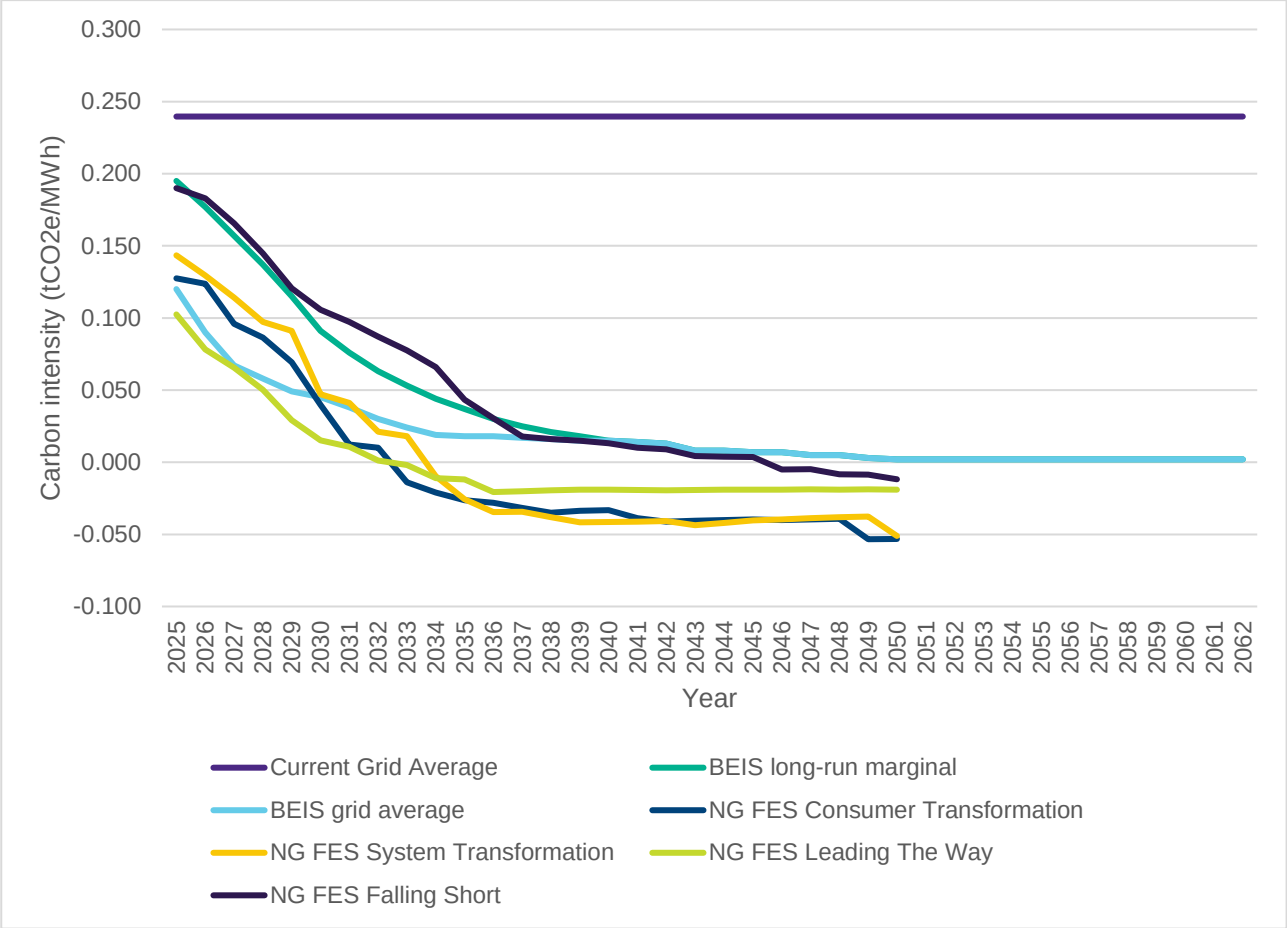
7.8.8 The current baseline for land that would be taken by construction of the Project is the existing agricultural land-use. However, installing solar panels above ground on agricultural land would likely not cause any disturbance to significant soil or vegetation carbon stocks.

7.8.9 There is potential for an increase in carbon sequestration in both soils and plants underneath the solar panels due to changes in landscape design (including wildflower planting) and reduction in soil disturbance (for example, there would be no ploughing). However, the magnitude of carbon sequestration through this practice would likely be insignificant compared to the magnitudes of GHGs emitted and avoided during the construction and operational phase of the Project (Bai and Cotrufo, 2022). As such, these emissions are proposed to be scoped out of this assessment.

7.8.10 The current baseline for electricity generation in the operational phase of the Project, with regard to GHG emissions, is the equivalent level of electricity generation from alternative sources connected to the electricity grid. The current average carbon intensity of electricity generation on the UK National Grid is 0.23963[3] $kgCO_2e/kWh$ in the present-day baseline, taken from UK Government GHG conversion factors for company reporting (BEIS, 2022a).

7.8.11 Potential scenarios for the future baseline of electricity generation are shown in Graph 1, which displays the carbon intensity of future marginal electricity generation projected by BEIS (as generated from alternative sources, in the absence of generation capacity provided by the proposed development) (BEIS, 2022). For means of comparison, the figure also displays the projected grid-average carbon intensity and the National Grid's 'Future Energy Scenarios' projected grid carbon intensities (National Grid ESO, 2022).

7.8.12 In most of these scenarios a rapid and sustained decarbonisation of baseline electricity generation is projected. In certain scenarios, negative values are projected in this sector (i.e. from carbon capture and storage) in order to deliver 'net zero' for the UK economy as a whole.



Graph 1: Projected carbon intensity of electricity generation

7.8.13 The current climatic conditions baseline is established by meteorological records for the area of the Project Site. The potential future climatic baseline can be considered using the

[3] Inclusive of the associated well-to-tank (WTT) emissions associated with extracting, refining and transportation of primary fuels before their use in the generation of electricity.

'UKCP18' projections published by the Met Office Hadley Centre (MOHC), which encompass the potential climatic outcomes in the UK from a range of potential global emissions and climate change scenarios (MOHC, 2018).

Proposed Approach

7.8.14 GHG emissions would contribute to the effect of global climate change. Assessment guidance from the Institute of Environmental Management and Assessment (IEMA, 2022) describes five levels of significance for emissions resulting from a development, each based on how the Project contributes towards achieving a net zero and 1.5°C-aligned reduction trajectory. To aid in considering whether effects are significant, the guidance recommends that GHG emissions should be contextualised against pre-determined carbon budgets, or policy and performance standards where a budget is not available. It is a matter of professional judgement to integrate these sources of evidence and evaluate them in the context of significance.

7.8.15 The proposed approach for assessing the impacts on climate change from the Project will take a life-cycle approach, considering the manufacturing-stage emissions and the benefits of renewable energy generation in operation compared to the baseline. The manufacturing-stage emissions will be caused directly and indirectly from sources at a variety of locations, including on-site and from the upstream supply chain of the materials used.

7.8.16 The embodied carbon of the Project will be assessed using published literature values from lifecycle assessments (LCAs) and Environmental Product Declarations (EPDs). This is likely to include manufacturing, transport and installation for the photovoltaic (PV) modules and balance of system (BoS) components (primarily inverters, transformers and cabling). GHG emissions associated with maintenance and end of life of the PV modules and BoS components are accounted for in some, but not all LCAs. Where considered they have minimal impact on the overall embodied carbon of the entire LCA (International Energy Agency, 2021). As such, consideration of the GHG effects from these stages is proposed to be scoped out, given their minimal GHG contribution and implementation of mitigation measures to minimise GHG impacts during the decommissioning stage, including recycling of the PV modules and BoS components wherever possible.

7.8.17 GHG emission reductions from operation of the PV system will be assessed based on the carbon intensity of the alternative source of generation that is displaced, i.e., the generator that would have been supplying the grid with electricity in the business-as-usual baseline without the Project.

7.8.18 Hence, the emissions savings would be compared with appropriate sources, including both present-day average carbon intensity of electricity generation on the UK National Grid at the time of the assessment and future marginal generation intensity predictions, calculated by BEIS (BEIS, 2022). Both are shown in Graph 1. Both baselines would be used since, on the one hand, the carbon intensity of electricity generation is expected to decrease in line with government policy, and so the intensity of the marginal generation source that the Project would displace would also reduce. However, this reduction in carbon intensity would only be possible through the approval and construction of projects such as Botley West, and government policy relies on projects such as these to be approved.

7.8.19 As set out below, no significant adverse effects due to climate risks to the Project are considered likely, with the potential exception of flooding. Assessment of climate risks is

therefore proposed to be scoped out of the assessment. However, the potential effect on power generation from changes in sunlight hours or cloud cover will be considered based on the UKCP18 projections.

Baseline studies

7.8.20 The sources of data concerning the present and future baseline have been described above, and no baseline surveys will be required.

7.8.21 Other data sources that will be used include the Digest of UK Energy Statistics (DUKES) to provide statistics on UK renewable energy and electricity generation (BEIS, 2022b), and any published national or local carbon budgets against which the GHG emissions of the Project would be contextualised. These would be taken either from legislation or from published research such as the Tyndall Centre for Climate Change (Tyndall Centre, 2022). The latest edition of all relevant data sources would be used.

Assessment of effects

7.8.22 The magnitude of impact will be expressed as tonnes of carbon dioxide equivalent (tCO2e), using 100-year global warming potential values for non-CO_2 GHGs from the Intergovernmental Panel on Climate Change's Sixth Assessment Report or as otherwise defined in published emissions factors and literature sources used (IPCC, 2021).

7.8.23 The sensitive receptor will be defined as the global atmospheric concentration of GHGs and it will be characterised as having a 'high' sensitivity, given the severe consequences of climate change and cumulative contributions of other sources.

7.8.24 The IEMA guidance referenced above (IEMA, 2022) states that a development's GHG impacts should be contextualised, for example on a sectoral basis, compared to the UK's national carbon budget or compared to policy requirements and performance standards. These comparisons would be used to determine whether a project's carbon footprint will support or undermine a 1.5°C compatible trajectory towards net zero.

7.8.25 It is considered that broadly speaking, the significance of the proposed development's GHG emissions can be contextualised in the following ways:

- with reference to the absolute magnitude of net GHG emissions as a percentage of applicable carbon budgets at the UK and local authority scale;
- through considering any increase/reduction in absolute GHG emissions and GHG intensity compared with baseline scenarios, including projections for future changes in those baselines; and/or
- with reference to whether the proposed development contributes to and is in line with the UK's national carbon budget goals and existing or emerging policy that supports for GHG emissions reduction consistent science-based commitments to limit global climate change to an internationally-agreed level.

7.8.26 Taking these factors into account, effects may be described as: major adverse, moderate adverse, minor adverse, negligible, or beneficial. Minor adverse and negligible effects are considered to be non-significant; the remaining levels of effect (major adverse, moderate adverse and beneficial) are all considered to be significant. The evaluation of significance will be carried out in accordance with the guidance, which will include the application of

professional judgement to contextualise and determine levels of significance in a way that makes clear the relationship between the Project's carbon footprint and a reduction trajectory consistent with measures required in the UK to meet our nationally-determined contribution towards the Paris Agreement's 1.5°C target (HM Government, 2022).

Scope of the assessment

7.8.27 The scope of the assessment is the impact of life-cycle GHG emissions from the solar farm, relative to the baseline of displaced alternative electricity generation and set within the context of national carbon budgets and other relevant local or national policy requirements, as summarised in Paragraph 7.8.25.

7.8.28 Potential changes in generating capacity of the PV system due to climatic changes during the Project's operational lifetime (i.e. cloud cover or sunlight hours) will also be considered using UKCP18 projections.

Issues proposed to be scoped out

7.8.29 Risks to the Project from climate change are proposed to be scoped out of the assessment, as these are not considered likely to be significant during the Project's operating lifetime of 42 years.

7.8.30 Increased ambient temperatures as a result of climate change are proposed to be scoped out, as the manufacturing standards for PV modules IEC TS 63126:2020, IEC 62548 and IEC 61215-1:2021 require modules to be functional over a wide range of temperatures, humidity and UV radiation. As such, the potential for small system efficiency losses due to hotter temperatures during the Project's lifetime are not considered to have any potential to significantly affect the lifecycle GHG emissions and thus significantly reduce the environmental effect of the renewable electricity generation.

7.8.31 Extreme weather events such as storms with high winds are also possible in the existing and future baseline and the Project's design will need to account for this. Manufacturing standards for PV modules (listed above) require consideration for extensive weathering (such as from hailstorms) and extreme thermal fluctuations. As such, extreme weather events are not considered to cause significant environmental effects to the Project.

7.8.32 Flood risk will be assessed, with appropriate climate change allowance, in the Flood Risk Assessment for the Project and no separate assessment is proposed within the climate change chapter.

7.8.33 GHG emissions resulting from land-use change during construction are likely to be insignificant. This is due to the current agricultural land use and minimal disturbance during installation of solar PV modules and BoS components. Carbon sequestration through biogenic growth during the operational period of the Project would also likely be insignificant compared to the magnitudes of GHGs emitted and avoided during the construction and operational phase of the Project (Bai and Cotrufo, 2022). As such the impact of land-use changes on the carbon sequestration potential of the land is proposed to be scoped out.

7.8.34 The GHG emissions associated with the decommissioning of the Project are also proposed to be scoped out. This is because the vast majority of emissions associated with solar PV developments arises in the construction stage, from the embodied carbon of the PV

modules and BoS components (International Energy Agency, 2021), and as such GHG emissions from decommissioning will be minimal in comparison.

Measures adopted as part of the Project

7.8.35 As a renewable energy development, climate change mitigation is an inherent aim of the Project, and at the scale of the Project it has the opportunity to make a material contribution towards the UK's Net Zero target through the decarbonisation of the UK electricity system.

7.8.36 To minimise GHG emissions during the construction of the Project, particularly in the embodied carbon resulting from the manufacture of the PV modules and BoS components, reductions will be sought in transport emissions across the supply chain, as well as prioritising low carbon material selections, where possible. These measures may evolve as the Project progresses in design.

7.8.37 GHG emissions during the decommissioning phase of the Project will be minimised through recycling of PV modules and BoS components where possible.

Potential cumulative effects

7.8.38 All developments which emit GHGs have the potential to impact the atmospheric mass of GHGs as a receptor, and so may have a cumulative impact on climate change. Consequently, cumulative effects due to other specific local developments are not individually identified but would be taken into account when evaluating the impact of the Project by defining the atmospheric mass of GHGs as a high sensitivity receptor.

Potential inter-related effects

7.8.39 Inter-related effects of climate change will be considered individually within the relevant topic chapters of the ES rather than within the Climate change chapter of the ES.

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7.9 Socio-Economics

Introduction

7.9.1 The socio-economic chapter will identify the potential impact of the Botley West Solar Farm on the socio-economic profile of the area. This assessment will be informed by relevant conclusions of other technical topics within the Environmental Impact Assessment (EIA), including (but not limited to) Landscape and Visual Impact, Air Quality, Noise, Traffic and Transport and Health. In addition, the socio-economic chapter will consider wider determinants not covered by other ES chapters.

Study Area

7.9.2 The Project is located in Oxfordshire and spans 3no. local government districts, namely; West Oxfordshire, Cherwell, and Vale of White Horse. Baseline information will, therefore, be collected for each of these local government districts to create a community profile of the local study areas relating to each of the 3 Project Sites (Northern, Central, and Southern). In addition, where available, small area data will also be analysed as well as national level data where appropriate for comparison.

7.9.3 Given the varying nature and type of socio-economic receptor, potential impacts will be assessed by various geographical impact areas. Impact areas will depend on the nature and type of receptor being assessed and will be set out in the ES.

Policy Context and Guidance

7.9.4 The socio-economics chapter will be produced in line with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, the relevant National Policy Statements as well as best practice guidance relating to socio-economic reporting.

7.9.5 Relevant policy and legislation in relation to socio-economics is considered at national and local level below.

National Policy & Legislation

National Planning Policy Framework

7.9.6 The National Planning Policy Framework (NPPF) was published in 2012 and revised on 20th July 2021. It is a document that sets out the government's policies for England and how these are expected to be applied.

7.9.7 **Paragraph 7** of the NPPF states that the purpose of the planning system is to contribute to the achievement of sustainable development, which it describes at a very high level as meeting the needs of the present without compromising the ability of future generations to meet their own needs. **Paragraph 8** highlights that to achieve this there are 3 overarching objectives; economic, social, and environmental. **Paragraph 9** states that in guiding developments towards sustainable development, local circumstances should be considered, to reflect the character, needs and opportunities of each area.

7.9.8 **Paragraph 81** asserts that planning decisions should help create the conditions in which businesses can invest, expand and adapt. This is particularly important where Britain can be a global leader in driving innovation.

7.9.9 **Paragraph 92** requires planning policies and decisions to aim to achieve healthy, inclusive and safe places and **Paragraph 93** requires the provision of social, recreational and cultural facilities and services for the community needs.

7.9.10 **Paragraph 98** states the importance of the access to a network of high-quality open spaces and sports facilities for health and well-being of communities.

7.9.11 **Paragraph 104** states that opportunities to promote walking, cycling and public transport use should be identified and pursued.

7.9.12 **Paragraph 130** states that planning decisions should ensure developments will function well and add to the overall quality of the area, while not preventing or discouraging appropriate innovation or change.

7.9.13 **Paragraph 174b** refers to the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland.

Healthy and safe communities, Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government

7.9.14 This planning practice guidance was published in March 2014 and updated in November 2019. It sets out guidance on promoting healthy and safe communities. It states that planning and health need to be considered together in two ways: in terms of creating environments that support and encourage healthy lifestyles, and in terms of identifying and

securing the facilities needed for primary, secondary, and tertiary care, and the wider health and care system.

7.9.15 The guidance explains that a healthy place needs to be inclusive and promote social interaction, as well as meeting the needs of children and young people to grow and develop. The needs for the elderly population and those with dementia and other sensory or mobility impairment should be considered as well.

Draft Overarching National Policy Statement for Energy (EN-1) (September 2021)

7.9.16 This Overarching National Policy Statement for Energy (EN-1) is part of a suite of NPSs issued by the Secretary of State for Energy and Climate Change. It sets out the Government's policy for delivery of major energy infrastructure.

7.9.17 The suite of energy NPSs were first designated in 2011. In the 2020 Energy White Paper a review of the NPS was announced under section 6 of the Planning Act. That review resulted in a number of amendments to the NPSs. This revised NPS will, therefore, eventually replace the previous overarching NPS, which was released in July 2011 and which is also discussed below.

7.9.18 Paragraph 1.6.3 makes clear that the draft NSP's are potentially capable of being important and relevant considerations in the decision-making process. The extent to which they are relevant is a matter for the relevant Secretary of State to consider within the framework of the Planning Act and with regard to the specific circumstances of each development consent order application.

Overarching National Policy Statement for Energy (EN-1)

7.9.19 This National Policy Statement (NPS) sets out national policy for energy infrastructure projects. **Part 4** relates to assessment principles and in particular **paragraph 4.1.4** sets out the requirement to consider environmental, social, and economic benefits and adverse impacts, at national, regional, and local levels.

7.9.20 **Paragraph 4.2.1** specifically refers to effects on human beings and highlights the requirement for an assessment of impact to consider the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects at all stages of the project, and also of the measures envisaged for avoiding or mitigating significant adverse effects.

7.9.21 **Paragraph 4.2.2** discusses the likely significant social and economic effects of the development and suggests it should be demonstrated how any likely significant negative effects would be avoided or mitigated. This information could include matters such as employment, equality, community cohesion and well-being.

Local Policy & Legislation

West Oxfordshire Local Plan (WOLP) 2031 (adopted 2018)

7.9.22 **Section 3** of the WOLP sets out the council's core objectives.

7.9.23 Objective **CO1** seeks to enable new development, services and facilities of an appropriate scale and type in locations which will help improve the quality of life of local communities and where the need to travel, particularly by car, can be minimised.

7.9.24 Objective **C07** supports sustainable economic growth which adds value to the local economy, improves the balance between housing and local jobs, provides a diversity of local employment opportunities, capitalises on economic growth in adjoining areas, improves local skills and work readiness, removes potential barriers to investment and provides flexibility to adapt to changing economic need.

7.9.25 **CO9** seeks to promote inclusive, healthy, safe and crime free communities and **C011** seeks to maximise the opportunity for walking, cycling and use of public transport.

7.9.26 **CO17** sets out an objective to minimise the use of non-renewable natural resources and promote more widespread use of renewable energy solutions.

The Cherwell Local Plan (CLP) 2011-2031 (adopted 2015)

7.9.27 The strategic objectives for developing a sustainable local economy contained within the CLP are **S01-S05 and** include measures such as promoting a more diverse local economy with an emphasis on attracting and developing higher technology industries (**S01**), supporting the diversification of Cherwell's rural economy (**S02**) and supporting an increase in skills and innovation (**S03**).

7.9.28 Cherwell also has a number of strategic objectives related to sustainable development (**S011-S015**). In particular it seeks to promote decentralised and renewable or low carbon energy (**SO11**) and to increase the attraction of and opportunities for travelling by public transport, cycle and on foot (**S013**).

Vale of White Horse Local Plan (VWHLP) 2031 Part 1 (adopted 2016)

7.9.29 The VWHLP identifies a number of key challenges and opportunities that are faced by the district and these are focused around four thematic areas. These are central to the Local Plan 2031 and are carried throughout the document. These are:

- building healthy and sustainable communities
- supporting economic prosperity
- supporting sustainable transport and accessibility, and
- protecting the environment and responding to climate change.

7.9.30 The core policies relevant to the socioeconomic chapter are **Core Policy 1**: Presumption in Favour of Sustainable Development, **Core Policy 6**: Meeting Business and Employment Needs, **Core Policy 28**: New Employment Development on Unallocated Sites, **Core Policy 33**: Promoting Sustainable Transport and Accessibility, **Core Policy 35**: Promoting Public Transport, Cycling and Walking, and **Core Policy 41**: Renewable Energy.

Baseline Information

7.9.31 The potential impacts arising from the Scheme are assessed relative to the baseline conditions and benchmarked against regional and national standards where appropriate. The key indicators and measures of the areas will be established for:

- · Population and deprivation;
- · An overview of the local economies;

- · The local labour markets; and
- · Land use, tourism and recreation.

7.9.32 Baseline data on the socio-economic profile of the study area will be obtained predominantly from a desktop study of the following sources:

Indicator	Elements	Source
Population & Deprivation	Age structure, social class, qualifications, earnings, deprivation, motor car availability and internet access	ONS, Census, English Indices of Deprivation
Economy	Economic activity, GVA, business activity	ONS, UK Business Count, Census,
Employment	Unemployment, commuting patterns, occupation, industry, earnings	ONS, Census, BRES, NOMIS Labour Market Profiles
Land Use, Tourism & Recreation	Agricultural land value, public rights of way, parks and amenity, tourist economy	Google Maps, Natural England (2010); Agricultural Land Classification map, PROW maps

Future Baseline Conditions

7.9.33 The EIA process will consider the existing baseline conditions within the socio-economic study area and the future baseline conditions (as far as reasonably practicable) using ONS population projections and reviewing local planning policy objectives and allocations.

Proposed Approach

Assessment of effects

7.9.34 There are no generally accepted criteria for assessing the significance of socio-economic effects and, in some cases, it can be difficult to quantify or measure such effects. The assessment of significance of impacts is based on the magnitude of the predicted change to the baseline position, as well as the sensitivity of the socio-economic receptors. Where the effect has been difficult to quantify, qualitative professional judgment will be applied, based on experience.

7.9.35 Impacts will be identified as either beneficial or adverse, whilst the sensitivity of the receptor and the magnitude of impact is classified as either high, medium, low, or negligible. The proposed assessment criteria are provided in the below tables:

Receptor Sensitivity/Value

Table 7.15: Definitions of Sensitivity

Sensitivity	Typical Descriptors
High	Receptor is identified as a policy priority Evidence of major socio-economic challenge or underperformance
Medium	Receptor is important in policy Evidence of under-performance or vulnerability
Low	Receptor is not a policy priority Evidence that the receptor is resilient and no particular challenges
Negligible	Receptor is not a policy priority Good overall performance in impact area

Magnitude of Impact

Table 7.16: Definitions of Magnitude

Magnitude	Typical Descriptors
High	Severe detrimental impact to key social and/or economic characteristics. Where the impact is able to be quantified this would equate to a percentage change of above 20%. Mitigation is likely to be hard to achieve or will require significant intervention. (Adverse).
	Major enhancement to key social and/or economic characteristics. Where the impact is able to be quantified this would equate to a percentage change of above 20%. There are unlikely to be better alternative means of achieving this benefit or other methods would be more time consuming, more expensive, and/or less effective. (Beneficial).
Medium	Discernible detrimental impact upon key social and/or economic characteristics. Where the impact is able to be quantified this would equate to a percentage change of 11-20% (Adverse).
	Discernible improvement to key social and/or economic characteristics. Where the impact is able to be quantified this would equate to a percentage change of 11-20% (Beneficial).
Low	Minor detrimental alteration to, one or more key social and/or economic baseline characteristic(s). Where the impact is able to be quantified this would equate to a percentage change of 6-10% (Adverse).
	Minor benefit to one or more key social and/or economic baseline characteristic(s), or a reduced risk of negative impact occurring. Where the impact is able to be quantified this would equate to a percentage change of 6-10% (Beneficial).
Negligible	Very minor detrimental alteration to one or more social and/or economic baseline characteristic(s). Mitigation is either easily achieved or little will be required. Where the impact is able to be quantified this would equate to a percentage change of under 5% (Adverse).
	Very minor benefit to one or more social and/or economic baseline characteristics. Alternative means of achieving this benefit are likely to be easier, cheaper, more effective, and/or less time-consuming. Where the impact is able to be quantified this would equate to a percentage change of under 5% (Beneficial).

Significance of Effects

7.9.36 The assessment of significance is based on the following matrix

Table 7.17: Assessment Matrix (Simple)

Sensitivity	Magnitude of Impact			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
Low	Negligible or minor	Negligible or minor	Minor	Minor or moderate
Medium	Negligible or minor	Minor	Moderate	Moderate or major
High	Minor	Minor or moderate	Moderate or major	Major

7.9.37 Using the above matrix, any effects classified as moderate or major are considered to be significant. A definition of the above terms is included below:

7.9.38 The broad definitions of the terms used should be in line with the following:

- Major: These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.

- Moderate: These beneficial or adverse effects may be important but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making.
- Minor: These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process but are important considerations in developing the scheme design.
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Scope of the assessment

7.9.39 The table below outlines the baseline indicators relevant to a socio-economic chapter and provides an assessment of the potential impact of the Project with a view to scoping the content of the ES.

Table 7.18: Scoping Table

Receptor	Potential Impacts	Further Assessment at EIA Stage (scope in)	Reasons
Construction & Decommissioning			
Employment	The proposed scheme will create direct and indirect jobs	**Yes**	Likely significant impact given scale of construction
Temporary Workers Accommodation	The construction stage could result in increased demand for accommodation comprising temporary bed or short-term rentals for any specialist contractors.	**No**	It is assumed that the majority of construction workers are likely to reside within their current locations, due to good road linkages and accessibility at a local and regional level to the site. As such there is unlikely to be a significant increase in demand for this type of accommodation.
Economic Output	The creation of jobs at construction stage will improve GVA and increase spend in the local economy	**Yes**	Considered likely to have a significant impact.
Education / Skills	The construction stage provides an opportunity for skilling up the workforce	**Yes**	Potential to have positive impact to provide training and skills to the workforce.
Recreation activities	Works may lead to temporary disturbance at public open spaces and disruption of public rights of way (PRoW), potentially affecting recreational activities.	**No**	Covered within Human Health chapter. Not considered to have significant socio-economic impact.
Land Use	Socio-economic impacts associated with land use and agricultural output are more prevalent to the operational phase of development	**No**	Not considered at construction stage.
Tourism	There is some potential for impact to tourist assets during construction but this is not considered to be significant.	**No**	Only potential short-term impacts to tourist economy at construction stage likely outweighed by spend of construction workers.

Receptor	Potential Impacts	Further Assessment at EIA Stage (scope in)	Reasons
Health, social care	During construction, local health care services could be affected or demand for these services could increase.	**No**	There is potential for a direct adverse impact on health during construction, however, any human health effects will be assessed within the human health and well-being chapter and can, therefore, be scoped out of the socio-economic reporting.
Open space / Public Rights of Way (PRoW)	The construction works may impact upon access to open space or public rights of way.	**No**	Covered within Human Health chapter.
Transport / Commuting Patterns	The is potential for temporary adverse effects to arise from disruption as a result of increased traffic during construction. In addition, road closures could impact commuting patterns.	**Yes**	Further assessment of potential impacts is considered appropriate.
Crime and safety	There is the potential for increased crime in relation to theft from the construction site	**No**	It is assumed that security arrangements for the Proposed Scheme will be in line with the requirements set out the Construction (Design and Management) Regulations and appropriate levels of security (personnel / CCTV) will be appointed. Therefore, there is unlikely to be a significant effect in relation to crime and safety.
Operation			
Employment	The maintenance of the Proposed Scheme will require and support the creation of a dedicated work force on regular basis. Indirect employment may also arise once the Scheme is finalised.	**Yes**	Job security and the creation of jobs would be considered a positive socio-economic contribution.
Economy	GVA associated with the direct, indirect, and induced jobs over lifetime of development can benefit local economy.	**Yes**	Potential to have significant benefits.
Recreation	There are opportunities to enhance access to recreational activities in the countryside as a result of the proposals, through nature trails etc.	**No**	Potential to have significant health benefits. Covered within Human Health Chapter
Open space / Public Rights of Way (PRoW)	Changes or improvements to access to public open space and public rights of way can have health benefits.	**No**	Potential to have significant health benefits. Covered within Human Health Chapter. Unlikely to be any significant socio-economic impact.
Land Use	Economic impact of the displacement of agricultural land uses for the duration of the Scheme could be significant.	**Yes**	Any impact on agricultural output should be fully considered and compared with economic benefit of proposal.
Tourism	There is some potential that the Project could impact the visual	**Yes**	Key policy driver for the area, raised as important consideration as part of

Receptor	Potential Impacts	Further Assessment at EIA Stage (scope in)	Reasons
	amenity of some tourist destinations.		stakeholder engagement exercise.
Housing	The proposed scheme could have potential impacts on house values and amenity of residents.	**No**	The solar farm and the substations are relatively low impact in terms of built form, and are only temporary in nature, limiting the potential for any widespread adverse effect on housing value or affordability. Unlikely to have any significant impact.
Human health and well-being	Potential benefits arising from improved accessibility to the countryside.	**No**	Will be covered in human health and well-being chapter.
Crime	The proposed scheme is unlikely to affect the crime profile of the area.	**No**	No impacts considered likely.
Education & Skills	There are opportunities to include education points within the Project to improve knowledge of renewable development and a skills plan can be produced to skill up existing workforce.	**Yes**	Potential significant benefits.
Transport / Commuting Patterns	Once complete there may be some potential changes to public transport routes	**No**	Covered in transport chapter – not considered to have significant socio-economic impact.

Preliminary Mitigation Measures

7.9.40 The socio-economic chapter will identify measures that help avoid, reduce and/or mitigate the adverse effects of the Project where applicable. Measures that can enhance the beneficial effects of the Project will also be identified. The measures will be identified throughout the development of the proposals before submission of the application for development consent through consultations with stakeholders and iterations of the Project design and will be reviewed as an ongoing process.

7.9.41 Mitigation and monitoring measures will be identified early in the proposed Project's lifetime, via engagement with relevant stakeholders.

Potential Cumulative Effects

7.9.42 There is potential for cumulative effects on sensitive receptors to occur when the construction of the Botley West Solar Farm is considered together with other developments. The potential cumulative effects between the construction of the Botley West Solar Farm and other developments with respect to socio-economics will be considered within the ES.

7.9.43 Other emerging developments will be cumulatively assessed against the baseline scenario to determine their cumulative effect and any cumulative socio-economic mitigation requirements (if required).

Potential Inter-Related Effects

7.9.44 This assessment will be informed by relevant conclusions of other technical topics within the Environmental Impact Assessment (EIA), including (but not limited to) Landscape and Visual Impact, Air Quality, Noise, Traffic and Transport and Health. The conclusions of these chapters will be reviewed and assessed in relation to the socio-economic baseline.

7.10 Human Health

Scope of the Assessment

7.10.1 The human health assessment within the Preliminary Environmental Impact Report (PEIR) and Environmental Statement (ES) will identify the potential impact of the Botley West Solar Farm on human health. This assessment will be informed by relevant conclusions of other technical topics within the Environmental Impact Assessment (EIA), including Landscape and Visual Impact, Noise and Vibration, Traffic and Transport, Socio-economics, Water Environment, Land Use and Ground Conditions, and any supporting technical assessments such as the effects of construction on air quality. In addition, the human health chapter will consider wider determinants of health not covered by other ES chapters.

7.10.2 The human health assessment will take a population health approach, informed by discussion of receptors within the topic specific EIA chapters. For each determinant of health, the human health assessment will identify relevant inequalities through consideration of the differential effect to the 'general population' of the Study Area and effects to the 'vulnerable population group' of that Study Area.

7.10.3 The scope of the assessment will consider the World Health Organisation (WHO) definition of health, which states that health is "*a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity*". The focus of the human health assessment within the EIA will be on community health and wellbeing and not on occupational health and safety.

7.10.4 The human health assessment will be informed by the study areas, zones of influence and receptors impacted or potentially impacted by air quality, noise, landscape and visual, traffic and transport, land use, land quality, water quality and population impacts. This will enable the effects on human health to be better understood. It is noted that the study areas for these topics do not necessarily define the boundaries of potential population health effects. As such, the human health assessment will also define a human health study area in order to broadly characterise representative population groups, which will focus on local authority districts within Oxfordshire, and England averages as comparators.

7.10.5 The wider determinants of health and health inequalities are key considerations when undertaking an assessment of human health as part of EIA. The following population groups are present and will be considered:

- The 'general population' including residents, workers, service providers, and service users.
- The 'vulnerable group population' including potential vulnerability due to: young age, older age, low income, poor health status, social disadvantage, restricted access or geographic proximity to Project's activities.

Baseline Environment

7.10.6 The Project is located in Oxfordshire. Baseline information will be collected for the local government districts of West Oxfordshire, Cherwell, and Vale of White Horse, using publicly available statistics. No bespoke baseline human health surveys are proposed to be undertaken as part of the assessment.

Proposed Assessment Methodology

7.10.7 This section provides a summary of the assessment methodology including baseline analysis, and the relevant standards and guidance that will be used.

Health baseline

7.10.8 The human health baseline will be developed through a desktop analysis of local population health data using publicly available statistics. Data will be collected at local government district level to create a community profile of the local study areas relating to each of the 3 sites (the Northern, Central and Southern sections). Where available, small area data will be analysed, for example, deprivation.

7.10.9 The baseline will inform the identification of relevant vulnerable groups, e.g. with increased sensitivity due to age, income level, health status, social disadvantage or access and geographical factors. Baseline data sources will include:

- Office for Health Improvement and Disparities (OHID) Local Authority Health Profiles **Invalid source specified.**;
- OHID Local Health – Small Area Public Health Data **Invalid source specified.**;
- English Indices of Deprivation 2019 **Invalid source specified.**;
- Office for National Statistics (ONS) – population health data;
- NOMIS Labour Market Profiles **Invalid source specified.**; and
- Google Earth Pro 2021 aerial and street level photography review

Relevant standards and guidance

7.10.10 The human health assessment will be undertaken in line with the latest best practice guidance on health impact assessment (HIA). There will be parity between physical health and mental health within the assessment. The following standards and guidance will inform the health assessment:

- Institute of Environmental Management and Assessment (IEMA) 2022 guidance on health in EIA series: effective scoping **Invalid source specified.** and determining significance **Invalid source specified.**.
- Institute of Public Health (IPH), Guidance, Standalone Health Impact Assessment and health in environmental assessment, 2021**Invalid source specified.**.
- International Association for Impact Assessment (IAIA) and European Public Health Association. A reference paper on addressing Human Health in EIA **Invalid source specified.** and academic discussion of the same **Invalid source specified.**.

- Public Health England, Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning (NSIP) Regime **Invalid source specified.**.
- Public Health England, Health Impact Assessment in spatial planning 2020 **Invalid source specified.**.
- World Health Organisation (WHO) guidelines on air quality and noise **Invalid source specified.**.

Potential Impacts

7.10.11 The potential impacts and scoping conclusions for the Project are based on the tools used by IEMA **Invalid source specified.**. The scoping exercise undertaken is informed by the following guiding principles contained within the IEMA guidance:

- The scoping exercise should be robust and complete, based on the information available (as set out in the Project Description);
- Scoping ought to be proportionate, i.e. focused on the likely and potentially significant effects on population health due to the Project.

7.10.12 Table 7.19 details the wider determinants of health considered and justifies the scope of the human health assessment. The scoping exercise is undertaken for the Project's construction and decommissioning phase (C&D), and the operational phase (O).

Table 7.19: Wider determinants of health scoping exercise

Determinant of health	In/ Out	Justification
Health related behaviours		
Physical activity	Out	C&D, O: Physical activity is an important determinant of health. However, to avoid duplication this issue is addressed under 'open space, leisure and play'.
Risk taking behaviour	Out	C&D: Issues of community health behaviours being detrimentally affected by the presence of the workforce are scoped out. This reflects a workforce of professionals who are assumed to return to their usual place of residence during periods of leave. The workforce is unlikely to be sufficiently large in number to affect local markets, e.g. for alcohol, cigarettes or gambling, to an extent which could significantly affect community health. Healthy workforce behaviour would be encouraged through a workforce management plan. There is not considered to be the potential for a likely significant population health effect, this issue is scoped out. O: It is anticipated that the operational workforce engaged in checks and maintenance activities will be smaller in number and more locally resident. Healthy workforce behaviour would be encouraged through a workforce management plan. There is not considered to be the potential for a likely significant population health effect. This issue is scoped out.
Diet and nutrition	**In**	C&D, O: Loss, albeit temporary but long-term, of agricultural land (including a potential change in the mix of arable and livestock farming) has the potential to impact food production and availability at a local context. This issue is scoped in for potential effects on access to affordable local healthy food (e.g. local farmers markets). This issue may be scoped down if findings of the Agricultural Land and Soils assessment, when taking into account factors such as resting agricultural soils and the relative importance of affected land for production to local markets, indicates a scale of change in food price or availability that is unlikely to result in significant health effects at a population level.
Social environment		
Housing	Out	C&D: The majority of workers are assumed to be based in the regional area, returning to their usual place of residence when not working. Where temporary accommodation is required, this would be provided on site, or potentially via existing B&B/hotel bed spaces, as is typical for the construction industry. It is not expected that use of temporary accommodation would be on a scale to significantly: displace local residents; adversely affect seasonal tourism; or otherwise affect

Determinant of health	In/ Out	Justification
		housing availability. There is not expected to be a loss of residential housing or permanent loss of outdoor spaces associated with dwellings. Housing effects are scoped out. O: The operational workforce is expected to be smaller in number and more locally resident. The solar farm and the substations are relatively low impact in terms of built form, limiting the potential for any widespread adverse effect on housing value or affordability that could result in a significant population level health effect. This issue is scope out on the basis of anticipated sensitive design, but the human health assessment will keep a watching brief on the socio-economic assessment. Only if widespread significant blight effects are identified in the socio-economic assessment will this issue be included in discussion within the health assessment.
Relocation	Out	C&D, O: Works would not involve compulsory land purchases of homes or community facilities. This issue is scoped out.
Open space, leisure and play	**In**	C&D: Works may lead to temporary disturbance at public open spaces and disruption of public rights of way (PRoW), potentially affecting recreational activities. These issues are scoped in. This includes considering the need for any temporary or permanent provision for alternative space or access. O: Operational land-take relate predominantly to agricultural land, and does not reduce community open spaces designated for recreation, leisure or play. During operation, potential changes to open space include: the beneficial effects of the proposed new recreational routes; as well as potential adverse effects of the temporary but long-term change of context of existing routes that may cause behavioural change in recreation. These issues are scoped in.
Transport modes, access and connections	**In**	C&D: There is the potential that construction works, including cable laying along roads and construction vehicles may disrupt local vehicle traffic (private and public transport) as well as active travel (pedestrians and cyclists). The following issues are scoped in: routine or emergency health related journey travel times; access to health promoting goods and services; community severance; and road safety. O: Minimal operational traffic and impacts on road users are anticipated during operation of the Project. It is unlikely that activity associated with checks and maintenance would have the potential for significant population health effects due to changes in: routine or emergency health related journey travel times; access to health promoting goods and services; community severance; or road safety. This issue is scope out, but the human health assessment will keep a watching brief on the transport assessment. Only if significant adverse effects are identified in the transport assessment will this issue be included in discussion within the health assessment.
Community safety	Out	C&D: Where surface excavations are undertaken these would be within controlled work areas, including use of appropriate fencing and notifications as required. Best practice measures would be secured through suitable management plans. The risk to the public from accidental injury, e.g. falls is scoped out. The project workforce requires skilled technical roles. There are not anticipated to be community safety or security issues associated with worker behaviour in communities. The project would operate appropriate safeguarding and modern slavery policies. The potential for widespread actual or perceived crime that could affect population health is unlikely. These issues are scoped out. O: Operational impacts on community safety from a project of this nature are likely to be related to changes in crime or fear of crime. Given the rural context of the Project, no such impacts are anticipated. Electrical risks to the public would be avoided though the design, including fencing of above ground electrical infrastructure. These issues are scoped out.
Community identity, culture, resilience and influence	**In**	C&D: Demographic changes that could affect community identity are not anticipated, as there would not be a large in-migration or out-migration of workers to local communities. Additionally, transient impacts of the Project, such as the use of construction barriers, lighting or signage, are not expected to disrupt community identity or community gatherings to an extent that could affect population health. Temporary employment opportunities are not expected to have a strong influence community identity. These issues are scoped out. O: The visual impact of the solar farm and substation is **scoped in** to consider the potential for the introduction of visual change in the landscape to influence community context to an extent that could significantly affect population mental health and wellbeing. This scope also considers the project's influence on community identity as a beneficial visual cue that society is responding to the locally declared climate change emergency. These issues may be scoped down if findings of the Visual Impact Assessment, when taking into account the schemes' design and secured landscaping mitigation, indicates a scale of visible change that is unlikely to result in significant health effects at a population level.
Social participation,	Out	C&D, O: The project will not directly affect land used for community interaction (e.g. meeting places, village greens, community centres etc that promote community voluntary, social, cultural or spiritual participation). Any indirect impacts on access to such spaces is addressed under the

Determinant of health	In/ Out	Justification
interaction and support		"Transport modes, access and connection" health determinant. This issue is scoped out. Whilst project wide consultation for the project is likely to support community empowerment and voice, allowing for all viewpoints to be heard and discussed, this is not considered to be of a scale that would result in significant population health effects. This issue is scoped out. The community response to landscape change are discussed under 'community identity'.
Economic environment		
Education and training	**In**	C&D: The project would support upskilling and career development in relation to its workforces. This may include apprenticeships and adult learning. Even though the workforces may be not of a scale to result in significant education and training opportunities (e.g. local apprenticeships) for the general population, there may be opportunities to target vulnerable groups. Such effects are scoped in to consider how benefits, including for local and vulnerable groups, could be enhanced. A large influx for workers, including those bringing families, is not expected, so changes to educational capacity or quality are unlikely and are scoped out. O: Operational education and training opportunities are not expected to be on a scale that could influence population health, even with benefits targeted to vulnerable groups. This issue is scoped out.
Employment and income	**In**	C&D, O: The project provides opportunities for good quality employment, which are scoped in. Even if the direct employment opportunities may be not of a scale to have significant health effects for the general population, there may be opportunities to target vulnerable groups with potential for significant benefits from reduced inequalities. The health chapter will consider the potential population health effects of direct and indirectly employment, including opportunities to enhance benefits for local and vulnerable groups. Any potential unemployment or adverse economic implications are also scoped in, for example, the project's effects on local businesses. The project's supply chain would be expected to operate appropriate policies that safeguard against significant population challenges to equality, health and safety, for both workers and, as appropriate, the public. These issues are scoped out. The project would operate appropriate employment equality policies but is not expected to influence how employment affects family structures and relationships in local populations. Occupational working conditions include risks that are appropriately managed through health and safety policies and practices. Project activities are not expected to differ from industry norms. These issues are scoped out.
Bio-physical environment		
Climate change and adaptation	**In**	C&D: Embodied carbon and climate altering pollutant emissions are not of a scale to have the potential for population level effects associated with climate change. This issue is scoped out. O: Operation of the Project will provide a positive climate adaptation in the form of renewable energy generation. The project would be a part of an energy sector transition that reduces the severity of climate change. The benefits to population health will be discussed, including reducing adverse physical and mental health effects of climate change for deprived populations, particularly in low- and middle-income countries globally.
Air quality	**In**	C&D: Construction and decommissioning activities have the potential to result in localised dust and construction traffic emissions. This issue is scoped in with potential to scope it down depending on the findings of the ES Air Quality chapter. The health chapter will be informed by the air quality modelling undertaken for the project. UK statutory limits, i.e. health protection standards, will be used as a benchmark. The potential for non-threshold health effects of some air pollutants will be discussed and taken into account. O: Operational air quality effects (e.g. maintenance vehicle emissions) are not anticipated to be of a scale, even accounting for non-threshold effects, that could affect population health. This issue is scoped out.
Water quality or availability	Out	C&D: Pollution of surface water (including Farmoor Reservoir) or groundwater bodies used as potable sources could affect the quality or availability of drinking water. Furthermore, the works are predominately in or adjoining agricultural land and food safety could also be compromised by contamination of agricultural water sources. Activities are unlikely to impact bathing waters. However, for all pathways, the project would adopt standard best practice spill avoidance and response measures that would be secured through management plans. Pollution risk issues are therefore scope out on the basis of the anticipated effectiveness of such measures, but the human health assessment will keep a watching brief on the water assessment. Only if significant adverse effects are identified in the Hydrology and Ground Conditions chapters will this issue be included in discussion within the health assessment. O: Checks and maintenance activities are unlikely to result in any water related risks to public health. Any risks would be managed through standard best practice spill avoidance and response measures that would be secured through management plans. Operational effects on water quality

Determinant of health	In/ Out	Justification
		and availability are not anticipated to be of a scale that could affect population health. This issue is scoped out.
Land quality	Out	C&D: Construction and decommissioning activities will involve limited excavation. Risks of new or historic pollutant mobilisation, including direct exposure and food contamination, are highly likely to be addressed by standard good practice mitigation measures that would be secured through management plans, including to mitigate against dust and aerosol exposure pathways. This topic is scoped out, but a watching brief will be kept on the soils assessment to confirm this scoping conclusion remains appropriate. Only if significant adverse effects are identified in the Agricultural Land and Soils chapter will this issue be included in discussion within the health assessment. O: Checks and maintenance activities are unlikely to require excavations or result in land quality related risks to public health. Any risks would be managed through standard best practice contamination avoidance and response measures that would be secured through management plans. This issue is scoped out.
Noise and vibration	**In**	C&D: Construction and decommissioning activities, albeit temporary and transient at any given location, are scoped in. The health chapter will be informed by the noise and vibration assessment of changes to daytime and night-time noise. Consideration will be given to population health effects, for example related to annoyance and sleep disturbance. This issue may be scoped down based on findings of the noise and vibration assessment. For example, if it is clear that elevated noise levels would be avoided through standard best practice noise and vibration mitigation measures that would be secured through management plans. UK regulatory standards will be used as a benchmark. O: The potential operational noise effects of the substation are scoped in to consider the potential for a population health effect. This issue may be scoped down based on findings of the noise and vibration assessment. For example, if it is clear that elevated noise levels would be avoided through secured design, such as acoustic housings, technology selection or noise barriers. Checks and maintenance activities are not expected to result in noise and vibration levels that could affect population health. This issue is scoped out.
Radiation	**In**	C&D: Non-ionising electro-magnetic field (EMF) effects are scoped out. Works would not include using, or making material changes to, active major electrical infrastructure producing EMF. Relevant public and occupational safeguards, secured through management plans, would be followed for the temporary electrical equipment used. Electric and magnetic fields strengths reduce rapidly with distance, often requiring only a few meters separation between the source and receptor, to reach background levels. No ionising radiation sources are proposed. These issues are scope out. O: Actual electro-magnetic field (EMF) risk to population health is scoped out on the basis that the project would adopt the International Commission on Non-ionizing Radiation Protection (ICNIRP) guidelines and Government voluntary Code of Practice on EMF public exposure. Such considerations are inherent to the detailed engineering considerations of cable specification and routing. Relevant public EMF exposure guideline limits are noted in NPS EN-5 and would be complied with by the project. These guidelines are long standing and have a high safety margin. The levels of exposure that they require would not pose a risk to public health. In line with good practice, public understanding of risk in relation to operational EMF are scoped in. The assessment will provide reassurance on the safety of the electrical infrastructure and avoid / reduce any widespread community concern that could affect mental health. This includes considering the potential for mental health effects and how these can be avoided or reduced through provisions of timely and non-technical information on how actual health risks are mitigated.
Institutional and built environment		
Health and social care services	Out	C&D, O: Effects on health and social care are scoped out. The project workforce is assumed to include a high proportion of people who are resident in the regional area. The UK workforce would have NHS entitlement irrespective of place of residence. UK workers away from their usual place of residence for a prolonged period would be able to register with local primary healthcare on a temporary basis. This would facilitate NHS funding for their care. Any multinational members of the workforce are assumed to be covered by health insurance provisions that would allow the NHS to recoup costs to an extent that avoided any significant adverse effect on healthcare services. This is routine practice across industries and sectors. The project will operate appropriate occupation health services. It is not expected that a high proportion of workers would move to the area with dependants requiring social care. Health protection measures such as screening and immunisations are expected to continue from the workers' usual place of residence. Similarly routine dental appointments are assumed to be with the worker's dental practice close to their usual place of residence. Other health services are not expected to be affected as no largescale

Determinant of health	In/ Out	Justification
		in-migration is expected and the workforce of skilled technical roles would return to their usual places of residence to access such services.
Built environment	Out	C&D: The potential for the project to affect existing features of the built environment that are supportive of population health has been considered and scoped out. The project cable route would use of trenchless techniques where necessary, or other measures, to avoid surface disruption at sensitive features, such as road crossings. Similarly, the position of existing services, such as water and sewer systems will be taken into account in planning the export cable corridor and techniques used. Appropriate diversions would occur to avoid disruption to such services. This issue is scoped out. Should works impact utilities (e.g. during cable burying), diversions will be included as secured by the CMP. O: The Project would introduce new but temporary elements in the built environment. This is assessed under the "community identity" health determinant. Operational activities are not considered to have waste management, land use or infrastructure use implications on a scale that could affect population health. These issues are scoped out.
Wider societal infrastructure and resources	**In**	C&D: The project's energy infrastructure would not generate public health benefits at this stage. This issue is scoped out. O: During operation, the project's wider societal contribution to supporting public health is scoped in. The project would provide energy infrastructure that supports many aspects of public health. A reliable supply of electricity is required in relation to factors including, population food safety, thermal conform, healthcare, learning, income generation and social networking

References

There are no sources in the current document.

7.11 Agricultural Land & Soils

Introduction

7.11.1 This chapter considers the potential impacts of the project on agricultural land and soil receptors and sets out the scope of the EIA and methodology to be used in the assessment of potential effects on these receptors.

7.11.2 This chapter should be read alongside the following:

- Section 7.9: Socio-Economics in relation to the assessment of the socio-economic impacts due to the change in land use during the construction and operation of the project.
- Section 7.3: Ecology in relation to the assessment of potential impacts to the habitats supported by the land and soils within the project;

Relevant Policy, Legislation and Guidance

Legislative and Policy Context

7.11.3 The following key legislation and policy documents relevant to agricultural land use and recreation will be considered within the assessment process:

National Policy

7.11.4 Overarching National Policy Statement (NPS) for Energy (2011) EN-1 Paragraph 5.10.8 states that:

"Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5), except where this would be inconsistent with other sustainability considerations. Applicants should also identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination."

7.11.5 The consultation version of NPS EN-3, as revised, makes it clear that site selection is a matter for the promoter, and that grid connection capacity and access will be a significant factor in site selection. The presumption remains that solar projects should make use of previously developed land, contaminated land, industrial land or agricultural land of classification 3b, 4 and 5 – i.e. not BMV land, however land type should not be a predominating factor in determining the suitability of selection of a site.

7.11.6 Paragraph 3.10.15 of the revised EN-3 states that:

"Whilst the development of ground mounted solar arrays is not prohibited on agricultural land classified 1, 2 and 3a, or sites designated for their natural beauty, or recognised for ecological or archaeological importance, the impacts of such are expected to be considered, and are discussed under paragraphs 2.10.66 – 2.10.83 and 2.10.98 – 2.10.110."

7.11.7 National Planning Policy Framework (July 2021) Paragraph 174 states that:

Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

7.11.8 The footnote to Paragraph 175 of the NPPF states that

"Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality".

Local Planning Policy

7.11.9 West Oxfordshire Local Plan 2031 (adopted 2018) Policy EH 6 states that:

Renewable or low-carbon energy development should be located and designed to minimise adverse impacts, with particular regard to conserving the District's high valued landscape

and historic environment. In assessing proposals, the following local issues will need to be considered and satisfactorily addressed:

- impacts on landscape, biodiversity, historic environment, agricultural land, residential amenity, aviation activities, highway safety and fuel/energy security, including their cumulative and visual impacts;

7.11.10 Vale of White Horse Local Plan 2031 (Adopted 2016) Core Policy 43: Natural Resources states:

The Council encourages developers to make provision for the effective use of natural resources where applicable, including:

viii. avoiding the development of the best and most versatile agricultural land, unless it is demonstrated to be the most sustainable choice from reasonable alternatives, by first using areas of poorer quality land in preference to that of a higher quality

7.11.11 Cherwell Local Plan (CLP) 2011-20131 (Adopted 2015) paragraph B201 states

B.201 There is increasing interest in the development of large scale solar PV arrays in Cherwell. The issues of local significance set out below will be relevant considerations in the determination of such proposals as well as the need to protect the District's high quality agricultural land(Grades1and 2).

Guidance documents

7.11.12 The agricultural land and soils assessment would take into account of the following guidance documents:

- Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 6 Land Use (Highways Agency et al. 2001);
- DMRB Volume 11, Section 3, Part 8 Pedestrians, Cyclists, Equestrians and Community Effects (Highways Agency et al. 1993);
- Natural England (2021) Guide to Assessing Development Proposals on Agricultural Land
- Code of Construction Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009).
- The Institute of Quarrying (2021) Good Practice Guide for Handling Soils in Mineral Workings
- IEMA (2022) A New Perspective on Land and Soil in Environmental Impact Assessment
- Agricultural Land Classification of England and Wales (1988). Revised guidelines and criteria for grading the quality of agricultural land.

Study area

7.11.13 The study area for the Agricultural Land and Soils assessment is the boundary of the Site as shown in Figure 1 and for the ES would be the Order limits. A buffer is not described for

the assessment of the impact on agricultural land and soils and as these would only occur on the land that is directly impacted by the Project.

Baseline information

7.11.14 Information that has been considered in relation to agricultural land and soils has included:

- Published Soil Survey and British Geological Survey information;
- Ministry of Agriculture, Fisheries and Food (MAFF) published 1 inch to 1 mile Provisional ALC Sheets 145 and 158;
- Defra Detailed ALC and Soil Survey work carried out in the Study area;
- Site specific climatic information taken from the Agroclimatic Datasets produced by the Meteorological Office for the MAFF ALC Guidelines (October 1988);
- Ordnance Survey maps at 1:25,000 scale to identify topographic characteristics of the survey area;

Geology, Soils and Agricultural Land Classification

7.11.15 This is an area dominated by rocks of Jurassic age with little or no superficial drift other than a small patch of glacial till and some terrace gravels along the Cherwell, Evenlode and Thames whose valleys are floored by alluvium.

7.11.16 There is a close correspondence between the soils and the geological parent materials such that the compiler of the 1:250,000 scale National Soil Map will have based it largely on the larger scale (1:50,000 and 1:63,360) geological maps and show the distribution of Soil Associations or groupings of soils that commonly occur together within a landscape setting.

7.11.17 The relationship between the geological maps and the Soil Associations found on the National Soil Map within the study area can be summarised in the Table below.

Geological Formation	Soil Association Code	Soil Association Name
Alluvium	813b	FLADBURY 1
Terraces 1&2	511h	BADSEY 1
Terrace 4	571u	SUTTON 1
Oxford Clay	712b	DENCHWORTH
Cornbrash	343a	ELMTON 1
Forest Marble	343c	ELMTON 3
Great Oolite	511a	ABERFORD

7.11.18 A brief description of each of the Soil Associations that are identified within the study area is provided below:

7.11.19 813b FLADBURY 1 is described as a collection of mainly "stoneless, clayey soils, in places calcareous, variably affected by groundwater" and developed in river alluvium on flat land with risk of flooding. Here it is found on the alluvium along the Evenlode and Cherwell. Along the Thames there are similar, but calcareous, soils of Association 814a THAMES

7.11.20 511h BADSEY 1 is described as a collection of “well drained calcareous and non-calcareous fine loamy soils over limestone gravel. Some deep fine loamy soils and fine

loamy soils over gravel and similar but shallower soils affected by groundwater". Here it is principally found on areas of the lower terraces i.e. terraces 1 and 2 where the soils are relatively shallow over gravel and there may be patterned ground.

7.11.21 571u SUTTON 1 is described as a collection "well drained fine and coarse loamy soils locally calcareous and in places shallow over gravel" Here it is principally found on areas of the higher terrace i.e. terrace 4. And is mapped where the soils are deeper over gravel than in the BADSEY 1 Association.

7.11.22 712b DENCHWORTH is described as a collection of mainly "slowly permeable seasonally waterlogged clayey soils, with similar fine loamy over clayey soils". This is the commonest association on Jurassic and Cretaceous clays, represented here by the Oxford Clay.

7.11.23 343a ELMTON 1 is described as a collection of "shallow, well drained brashy calcareous fine loamy soils over limestone. Some similar deeper soils and some non-calcareous and calcareous clayey soils" i.e. similar to 343a ELMTON 1 but with significantly less amounts of more clayey soils. Here it is found on the Cornbrash.

7.11.24 343c Elmton 3 is described as a collection of "shallow, well drained brashy calcareous fine loamy soils over limestone. Some similar deeper slowly permeable seasonally waterlogged mainly calcareous soils" i.e. similar to 343a ELMTON 1 but accompanied by significant amounts of more clayey soils with impeded drainage. The use of lower case i.e. Elmton 3 rather than ELMTON 3 indicates an association with a more variable collection of component soils than in Associations with upper case names. Here it is found on the narrow outcrop of the Forest Marble where alternating beds of clay and limestone give contrasting soils over short distances.

7.11.25 511a ABERFORD is described as a collection of "shallow, locally brashy, well drained calcareous fine loamy soils over limestone. Some deeper soils in colluvium". In general this Association has deeper soils over limestone than those found in 343a ELMTON 1 or 343c Elmton 3. This is the soil association which has the Great Oolite as the parent material.

7.11.26 Most of the area is on MAFF ALC 1 inch to one mile scale Provisional Sheet 145 (See Figure 1) on which most of the Associations described above are shown as undifferentiated Grade 3. The only exceptions are some, but not all, of the areas of 571u SUTTON 1 on terrace gravels south of Oxford airport and a small area of 511a ABERFORD over limestone near Cassington which are shown as Grade 2.

7.11.27 On sheet 158 (See Figure 1) the only Association which has to be considered is 712b DENCHWORTH, most of which is shown as undifferentiated Grade 3. However, the area of the site south east of the Farmoor Reservoir is shown as Grade 4.

7.11.28 These maps were produced in the early 1970's before the ALC system was comprehensively revised in 1988 and whilst they provide a guide to the likely relative quality of land, they cannot be used to accurately assess the ALC of specific sites and do not provide a delineation of Subgrade 3a which is relevant to the identification of areas of BMV land.

7.11.29 MAFF has undertaken further detailed ALC survey work, applying the revised ALC Guidelines, which includes a small part of the study area to the west of Cassington as shown on Figure 1 (Post 1988 survey). This shows the area surveyed to comprise predominantly Subgrade 3b land, but with a small proportion of Grade 2 and Subgrade 3a land at the southern edge.

Scope of baseline studies

7.11.30 In addition to the baseline information collected as part of the desk study described above, it is proposed to undertake site surveys would be undertaken to establish the nature of the soils and agricultural land quality within the study area and identify potential areas of the best and most versatile Grades 1, 2 and Subgrade 3a land.

7.11.31 The initial survey of soils and ALC would include a semi-detailed survey including hand auger borings examined at a density of 1 every 2ha, together with the excavation of soil pits within representative soil units to identify the distribution of soil types and ALC grades across the Site.

7.11.32 Following this work, if areas of Grade 1, 2 or Subgrade 3a are identified through this semi-detailed survey work, or there are areas where the distribution of grades is unclear and might include a proportion of these grades, these areas would be subject to further detailed survey to accurately identify any areas of high-quality land within the study area. This detailed survey would include auger borings taken at 100m intervals within the identified areas, together within additional soil pit excavation, where necessary, to confirm soil characteristics.

Assessment of effects

7.11.33 The potential effects on agricultural land and soils considered during the construction and operational phases of the Project will include:

- Agricultural land and land use including the loss of BMV land;
- Quality of soil resources in terms of potential for disturbance/damage or improvement through changes in land management; and
- Potential for Loss of soil resources

Approach to Assessment of Effects

7.11.34 The agricultural and soil assessment will take into account the guidance set out in the documents listed above. The assessment of the likely effects on these resources will consider the following activities:

- Identification of all agricultural land and soil receptors that have the potential to be affected by the Project and the provision of a description of those resources and their importance and/or value;
- Identification of the likely impacts of the Project on agricultural land and soil resources within the study area;
- Assessment of significance of effects, taking into account measures proposed to avoid, reduce or remedy adverse effects.

7.11.35 The desk-based baseline study and subsequent site surveys will identify agricultural land and soil resources that have the potential to be affected in the study areas,

7.11.36 The approach to determining the significance of effects is a two-stage process that involves defining the sensitivity of the receptors and the magnitude of the impacts. The assessment

would follow the approach set out in Section 4 with regard to the identification of receptor sensitivity, impact magnitude and evaluation of significance of effects.

7.11.37 The significance of the effect upon agricultural land and soils will be determined by considering both the magnitude of the impact and the sensitivity of the receptor. Where a range of significance levels is possible, the final assessment for each effect will be based upon expert judgement.

Approach to Mitigation and Monitoring

7.11.38 Where practicable, measures to avoid or reduce damage to soils would be included into the design for the project. An outline soil management strategy will be produced that will identify best practice methods for the stripping, storage and replacement of soils on areas of temporary land take during construction. Relevant guidance documents include:

- Institute of Quarrying (2021) Good Practice Guide for Handling Soils in Mineral Workings; and
- Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (including the Toolbox Talks).

Issues Proposed to be Scoped Out

7.11.39 It is proposed that the decommissioning effects are scoped out for the agricultural land and soils topic. Although the full details of the likely decommissioning works are not known at this stage, they would be expected to be similar to, or of a lower magnitude of impact than those during the construction stage. It is therefore proposed that the decommissioning effects be considered the same as for those during the construction period and would therefore be scoped out for a specific assessment within the ES.

7.12 Cumulative Effects and Inter-relationships

7.12.1 Schedule 4 of the EIA regulations require the consideration of the potential impact of inter-relationships and cumulative effects of “existing and/or approved development” with the development.

7.12.2 The Planning Inspectorate’s Advice Note Seventeen: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects (The Planning Inspectorate, 2019) recommends that, through consultation with local authorities and other relevant consenting bodies, other major developments in the area should be taken into account when conducting cumulative effects assessment, including those which are:

- Under construction.
- Permitted application(s), but not yet implemented.
- Submitted application(s), but not yet determined.
- Projects on the National Infrastructure Planning Portal’s Programme of Projects.
- Projects identified in relevant development plans.
- Projects identified in other plans and programmes as may be relevant.

7.12.3 The overarching National Policy Statement (NPS) for Energy EN-1 states that "when considering cumulative effects, the ES should provide information on how the effects of the applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted, as well as those already in existence."

7.12.4 The EIA will consider the following, as appropriate:

- The likely significant cumulative effects of the Project and other major local and existing and/or approved development; and
- The potential for impact interactions leading to an aggregated environmental effect on a receptor being greater than each of the individual effects that have been identified (e.g. local people being affected by noise, dust and increased traffic levels during the construction of the Project, where those impacts are greater combined than individually).

7.12.5 A list of other proposed developments and allocations to be considered within the EIA process will be prepared for use in the assessment process. Each topic author will review the overall list of developments and allocations and identify those relevant to their topic. The topic chapters of the EIA Report will include an assessment of the potential for significant cumulative effects with the relevant developments.

7.12.6 Initial consultation with the local authorities is already underway to create a long list of projects for review, with a view to a short list for cumulative assessment within the EIA.

7.12.7 A request was issued via the lead authority, on 4th April 2023, setting out the proposed approach to cumulative environmental assessment, seeking inputs on a long list to identify major residential, employment, strategic infrastructure (including transport) and leisure developments, which represent permitted and likely developments within the cumulative Zones of Influence. Initial inputs have been received from WODC and Cherwell in respect of the long list.

8 PROPOSED SCOPE OF ASSESSMENT: SUPPORTING TECHNICAL ASSESSMENTS

8.1.1 Whilst Chapter 7 covers the scope of topics that would be included as full ES chapters, this chapter identifies topics where the scope of works only includes a specific aspect of a topic (such as construction dust) and therefore only a supporting technical assessment is required as part of the ES, not a full chapter.

8.2 Air Quality (dust during construction)

Introduction

8.2.1 This chapter considers the relevant policy, legislation and guidance, baseline conditions, methodology and the scope of the air quality assessment.

8.2.2 An air quality (dust during construction) technical assessment will accompany the application, with any significant effects being mitigated through the CEMP.

Relevant Policy, Legislation and Guidance

8.2.3 The assessment of effects will be undertaken with reference to the limit values in the Air Quality Standards (England) Regulations 2010, amended by The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 and objectives in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007).

8.2.4 The assessment of effects will be undertaken with reference to published guidance including the Institute of Air Quality Management (IAQM) (2014) '*Guidance on the assessment of dust from demolition and construction*' and the Environmental Protection UK (EPUK)/IAQM (2017) '*Land-Use Planning & Development Control: Planning For Air Quality*' document. The assessment will also consider the Vale of White Horse District Council Air Quality Developer's Guidance.

Baseline Information

8.2.5 The nearest Air Quality Management Areas (AQMAs) to the site are set out in Table 8.1.

Table 8.1: Nearest Air Quality Management Areas

Local Authority	AQMA Name	Pollutant AQMA is designated for	Distance from Application Site
Cherwell District Council	AQMA No 1 - An area incorporating Hennef Way between the junctions with Ermont Way and Concorde Avenue.	1-hour and annual mean nitrogen dioxide (NO_2) from road traffic	20 km
	AQMA No 2 - An area incorporating sections of Oxford Road, Bloxham Road, South Bar, High Street, Horsefair, North Bar, Warwick Road and Southam Road, Banbury	Annual mean NO_2 from road traffic	18.5 km
	AQMA No 3 - An area incorporating a section of Bicester Road,	Annual mean NO_2 from road traffic	3 km

Local Authority	AQMA Name	Pollutant AQMA is designated for	Distance from Application Site
	Kidlington to the north of its junction with Water Eaton Lane		
	AQMA No 4 – An area incorporating sections of Kings End, Queens Avenue, Field Street, St Johns Street, Bicester.	Annual mean NO_2 from road traffic	11.8 km
West Oxfordshire District Council	Chipping Norton AQMA - An area incorporating Horse Fair, High Street, Market Place A44 and part of West Street in Chipping Norton, Oxfordshire	Annual mean NO_2 from road traffic	15 km
	Witney AQMA - An area incorporating Bridge Street, Witney and the junctions with New Yatt Road, Newland, Mill Street and High Street.	Annual mean NO_2 from road traffic	7.2 km
Vale of White Horse District Council	Abingdon AQMA - An area encompassing properties along the main road system in the centre of Abingdon. This includes part or all of Stert Street, Bridge Street, High Street, Stratton Way, Vineyard, West St Helens Street, Ock Street and Bath Street.	Annual mean NO_2 from road traffic	8.2 km
	Botley AQMA - An area encompassing a number of properties in Westminster Way, Coles Court, Stanley Close and along the Southern Bypass	Annual mean NO_2 from road traffic	1.9 km
	Marcham AQMA - An area along the A415 and includes part of Abingdon Road, Packhorse Lane and Frilford Road from the western village boundary sign to the eastern village boundary sign, all within the village of Marcham, Oxfordshire	Annual mean NO_2 from road traffic	8.2 km
Oxford District Council	City of Oxford AQMA – the entire borough	Annual mean NO_2 from road traffic	2.4 km

8.2.6 The main existing sources of pollutants near the site impacting the air quality would be traffic from the main roads including the A420, A40 and A44 and to a lesser extent, the local road network.

Proposed Approach

Baseline Studies

8.2.7 A desk study will be undertaken to evaluate the existing air quality in the area surrounding the site. Background air quality will be reviewed and characterised by drawing on information from the following public sources:

- Defra's mapped concentration estimates; and
- The results of available local air quality monitoring.

8.2.8 At this stage, a desk top study is expected to be sufficient, and no air quality monitoring is proposed to characterise the baseline.

Assessment of Effects

8.2.9 The risk of dust and emissions during construction works at the site and during the laying of the underground cables will be assessed, having regard to the IAQM (2014) '*Guidance on the assessment of dust from demolition and construction'*. The risks will be assessed at human-health and ecological receptors.

8.2.10 Construction-related vehicle movements will be compared with the relevant threshold criteria in the EPUK/IAQM (2017) '*Land-Use Planning & Development Control: Planning For Air Quality*' document for determining when an air quality assessment is required. At this stage, it is anticipated that the number of construction-related vehicle movements will not exceed the relevant threshold criteria and a detailed air quality assessment will not be required.

8.2.11 Generic mitigation measures designed to control dust nuisance effects and emissions during construction, consistent with the level of risk, will be recommended. These will be drawn from the IAQM (2014) '*Guidance on the assessment of dust from demolition and construction'*.

8.2.12 The cumulative effects during construction and laying of the underground cables will be assessed qualitatively.

8.2.13 During the operational phase low levels of vehicle movements are expected. Operational vehicle movements will be compared with the relevant threshold criteria in the EPUK/IAQM (2017) '*Land-Use Planning & Development Control: Planning For Air Quality*' document for determining when an air quality assessment is required. It is anticipated that the number of operational vehicle movements will not exceed the relevant threshold criteria and a detailed air quality assessment will not be required.

Scope of the Assessment

8.2.14 The scope of the assessment will be limited to the risk of dust impacts during construction.

Issues Proposed to be Scoped Out

8.2.15 The level of construction and operational traffic is expected to be low and is not likely to result in significant air quality effects. Therefore, an assessment of the air quality effects associated with traffic has been scoped out of the assessment.

8.3 Glint and Glare

Introduction

8.3.1 This chapter considers the baseline conditions, glint and glare guidelines, methodology and determination of whether glint and glare effects should be scoped into the EIA.

8.3.2 This chapter has been prepared by Pager Power Ltd. Pager Power has undertaken over 1,000 glint and glare assessments in the UK and internationally. The company's own glint and glare guidance is based on industry experience and extensive consultation with industry stakeholders including airports and aviation regulators.

8.3.3 The Project is a ground-mounted solar photovoltaic development, located near Oxford, England, UK. The Project consists of three Sites of solar panels likely with a vertical tilt between 10° and 30°.

8.3.4 A technical assessment will accompany the application, with any significant effects being mitigated through design (layout changes or screening) prior to the planning application being submitted.

Published Guidance and Approach

8.3.5 Guidelines exist in the UK (produced by the Civil Aviation Authority) and in the USA (produced by the Federal Aviation Administration) with respect to solar developments and aviation activity. The UK CAA guidance is relatively high-level and does not prescribe a formal methodology. Pager Power has reviewed existing guidelines and the available studies to define its own glint and glare assessment guidance document and methodology. This methodology defines a comprehensive process for determining the impact upon road safety, residential amenity, railway operations and infrastructure, and aviation activity.

8.3.6 Pager Power's approach is to undertake geometric reflection calculations and, where a solar reflection is predicted, consider the screening (existing and/or proposed) between the receptor and the reflecting solar panels. For aviation activity, where a solar reflection is predicted, solar intensity calculations are undertaken in line with the Sandia National Laboratories' FAA methodology. The scenario in which a solar reflection can occur for all receptors is then identified and discussed, and a comparison is made against the available solar panel reflection studies to determine the overall impact.

8.3.7 The available studies have measured the intensity of reflections from solar panels with respect to other naturally occurring and manmade surfaces. The results show that the reflections produced are of intensity similar to or less than those produced from still water and significantly less than reflections from glass and steel.

8.3.8 The following guidance documents will inform the approach to the design and assessment of the Project:

- Pager Power Glint and Glare Guidance, Fourth Edition, September 2022.
- Renewable and Low Carbon Energy, Ministry of Housing, Communities & Local Government, 18 June 2015.
- Draft National Policy Statement for Renewable Energy Infrastructure (EN-3), Department for Business, Energy & Industrial Strategy, September 2021.
- Review of Solar Energy System Projects on Federally-Obligated Airports, Federal Aviation Administration (FAA), May 2021.

Assessment Methodology

8.3.9 The glint and glare assessment methodology has been derived from the information provided to Pager Power through consultation with stakeholders and by reviewing the available guidance and studies. The methodology for a glint and glare assessments is as follows:

- Identification of relevant receptors based on their type and range from the panel area.

- Technical modelling of the sun path throughout the year to calculate the times and duration of predicted glare for the proposed panel configuration.
- Evaluation of impact significance based on the criteria for the receptor type in accordance with Pager Power's guidance (the main considerations are duration, field of view and intensity but this varies per receptor type).
- Identification of areas that require mitigation, if any.
- Mitigation strategy if required.

8.3.10 There is no formal guidance with regard to the maximum distance at which glint and glare should be assessed. From a technical perspective, there is no maximum distance for potential reflections. However, the significance of a solar reflection decreases with distance. This is because the proportion of an observer's field of vision that is taken up by the reflecting area diminishes as the separation distance increases. In most instances. terrain and shielding by vegetation are also more likely to obstruct an observer's view at greater distances.

8.3.11 A 1km assessment area is considered when identifying ground-based receptors surrounding the Project. The following receptors have been identified:

- Residential dwellings.
- Local roads.

8.3.12 Under the Pager Power methodology, technical modelling is not recommended for local roads, where traffic densities are likely to be relatively low. Any solar reflections from the Project that are experienced by a road user along a local road would be considered low impact in the worst case in accordance with the guidance and industry best practice.

8.3.13 If a railway line is identified within 200m of the Project then a technical assessment is undertaken for railway receptors within a 500m assessment area. This assessment area size is deemed appropriate when identifying railway receptors and infrastructure. A railway line has been identified which passes through the Project and will be assessed as part of the glint and glare assessment.

8.3.14 There is no formal buffer distance within which aviation effects must be modelled. However, in practice, concerns are most often raised for developments within 10km of a licensed aerodrome. Requests for modelling at ranges of 10-20km are far less common. Assessment of aviation effects for developments over 20km from a licensed aerodrome is a very unusual requirement. A 10km assessment area is considered when identifying aviation receptors. The following receptors have been identified:

- Oxford International Airport, less than 1km east of the Project Site.
- Oaklands Farm Airstrip, approximately 5.4km west of the Project Site.
- RAF Abingdon, approximately 5.8km south of the Project Site.
- Enstone Aerodrome, approximately 7.4km north-west of the Project Site.
- RAF Weston-on-the-Green, approximately 7.4km east of the Project Site.
- Cornbury House Airstrip, approximately 9.5km west of the Project Site.

Baseline

8.3.15 The location of the Project is semi-rural, surrounded by roads, dwellings, a licenced airport, and local airfields.

Impact Prediction and Mitigation

8.3.16 The impact of the Project can only reliably be determined via detailed geometric modelling, this will be undertaken in accordance with the methodology and guidance as stated in previous section.

8.3.17 Common mitigation strategies for ground-based receptors are:

- Site surveys to inform visibility (and landscaping plans) more accurately.
- Provision of screening (planting or opaque fence) at the Project Site boundary or elsewhere between the observer and reflecting panel areas.
- Changes to the site configuration. This may involve:
  - Changes to the azimuth angle of the solar panels; and/or
  - Changes to the elevation (tilt) angle of the solar panels.

8.3.18 The most common mitigation solution for ground-based receptors is the provision of screening at the site perimeter. A screening solution that sufficiently obstructs visibility of the potentially reflecting panels will mitigate impacts.

8.3.19 The reflecting panels that should be obscured from view, based on the proposed configuration, will be defined within the impact assessment (if any).

8.3.20 Where screening solutions are not feasible changes to the site configuration can be investigated.

8.3.21 For aviation receptors, where mitigation is recommended/required, the most common solution is changes to the site configuration.

Residual Effects

8.3.22 Subsequent to the implementation of mitigation to remove any significant impacts, no significant effects would remain upon the receptors.

Cumulative Assessment

8.3.23 Assessment of cumulative effects will be considered in connection with any relevant consented or proposed solar developments in the surrounding area.

Conclusion

8.3.24 The ground-based receptors identified are residential dwellings and local roads.

8.3.25 A railway line has been identified which passes through one of the areas of the Project. Railway infrastructure within 500m of the Project will be assessed in the glint and glare assessment.

8.3.26 Oxford Airport is located less than 1km from the Project. It will be necessary to undertake detailed modelling to assess aviation activity associated with this airfield.

8.3.27 Oaklands Farm Airfield, RAF Abingdon, Enstone Aerodrome, RAF Weston-on-the-Green and Cornbury House Airstrip are all located between 5km and 10km from the aerodrome. Aviation activity associated with these airfields will be assessed at a high-level.

8.3.28 Any significant effects towards the identified ground-based receptors can be adequately mitigated – the most common approach being the provision of screening at the site perimeter. Other solutions such as changes to the site configuration can be considered.

8.3.29 Considering the relative location of the Project Site with respect to the surrounding aviation infrastructure, changes to the site configuration may be required. If required, it is expected that changes to the site configuration would be sufficient to remove any significant effects upon aviation activity.

8.3.30 It is recommended that glint and glare effects be presented as a technical assessment rather than a significance assessment within the main ES.

9 TOPICS PROPOSED TO BE SCOPED OUT OF THE EIA PROCESS

9.1 Material Assets

9.1.1 The EIA Regulations refer to 'material assets', including architectural and archaeological heritage. The phrase 'material assets' has a broad scope, which may include assets of human or natural origin, valued for socio-economic or heritage reasons. Material assets are in practice considered across a range of topic areas within an ES, in particular the socio-economic and historic environment chapters. These topics are proposed to be included within the ES. Therefore, no separate consideration of material assets is considered necessary.

9.2 Daylight, Sunlight and Microclimate

9.2.1 Due to the location of the proposed works and the nature of the surrounding land use it is not considered likely that the Project would have significant effects in relation to daylight and sunlight. Please note that glint and glare assessment will be included as part of the PEIR and ES. In addition, the nature of the Project is not likely to result in microclimate changes and therefore this topic is also scoped out of the assessment. The effects of the Project on climate change would be considered separately in a Climate Change and Carbon chapter of the ES.

9.3 Waste

9.3.1 The Project is likely to generate waste during the construction and decommissioning phases such as general construction waste, including packing waste from materials, off-cuts from fencing, secondary aggregates used for temporary access roads and hard-standings etc.

9.3.2 Electrical infrastructure such as PV modules, racks, inverters, transformers, batteries and other supporting infrastructure will be manufactured offsite and delivered to the Site ready for installation and therefore construction and assembly waste is expected to be minimal.

9.3.3 An Outline CoCP will be submitted with the application setting out details of how waste materials will be managed in accordance with the waste hierarchy, good practice measures for managing waste in construction and the roles and responsibilities of the construction contractor.

9.3.4 Waste generation during the operation phase will be minimal because of the nature of the Project.

9.3.5 A separate ES chapter covering waste is not considered necessary.

9.4 Electromagnetic Fields (EMF)

9.4.1 Power frequency electric, magnetic and electromagnetic fields (EMF) arise from generation, transmission, distribution and use of electricity and occur around power lines and electric cables and around domestic, office or industrial equipment that uses electricity. Electric fields are the result of voltages applied to electrical conductors and equipment.

Magnetic fields are produced by the flow of electric current; however, although fences, shrubs and buildings and block electric fields, most materials do not readily block magnetic fields. The intensity of electric fields and magnetic fields diminishes with increasing distance from the source.

9.4.2 Electric fields depend on the operating voltage of the equipment. Magnetic fields depend on the electrical currents flowing and are significantly limited by most common materials. Typically, ground-level magnetic fields from underground cables fall much more rapidly with distances than those magnetic fields corresponding to an overhead line, but can be higher at small distances from the cable.

9.4.3 There is no direct statutory provision in the planning system relating to protection from EMFs. The Power Lines: Demonstrating compliance with EMF public exposure guidelines' published by DECC in 2012, that guidelines for both public and occupational exposure published by the International Commission on Non – Ionizing Radiation Protection (ICNIRP) in 1998 should be taken into account. The guidance states that "overhead power lines at voltages up to and including 132 kV, underground cables at voltages up to and including 132 kV and substations at and beyond the publicly accessible perimeter" are not capable of exceeding the ICNIRP exposure guidelines and therefore no assessment is required for these and other types of infrastructure listed on the Energy Networks Association website. As such, the scope of the assessment of EMF in the EIA will be limited to cables associated with the Project that exceed 132kV.

9.4.4 The only element of the Project which is likely to exceed this voltage is the export cable between the 220/400kV proposed primary substation and the 400kV National Grid Substation. The export cable corridor is located approximately 120m away from the nearest residential receptors.

9.4.5 The ES will, however, detail any design measures taken to avoid any potential for EMF on receptors.

9.4.6 As such, due to interactions with human health covered elsewhere within individual topics of the ES, it is not considered necessary to provide a separate Human Health ES chapter.

9.5 Major Accidents and Disasters

9.5.1 The EIA regulations at Schedule 4 require that project promoters include a description of the expected significant effects (if any) of the Project on the environment deriving from its vulnerability to risks of major accidents and/or disasters.

9.5.2 The Project does not introduce any construction or operational uses or procedures that are considered to have a risk of major accident or disasters that could affect existing or future sensitive receptors, which are not considered through existing regulatory regimes.

9.5.3 The EIA methodology section reported in the ES will identify Major Accident risks and/or Disasters that could impact the Project where relevant and propose mitigation where necessary.

9.5.4 A separate ES chapter covering major accident risks or possible disasters is not considered necessary.

9.6 Transboundary Effects

9.6.1 The Planning Inspectorate's Advice Note Twelve: Transboundary Impacts and Process Relevant to Nationally Significant Infrastructure Projects (The Planning Inspectorate, 2020) explains the statutory notification and consultation requirements in respect of transboundary effects of development on European Economic Area Member States ('EEA States').

9.6.2 Regulation 32 of the EIA Regulations establishes the procedural duties necessary where the Secretary of State (SoS) is of the view that a Nationally Significant Infrastructure Project (NSIP) is likely to have significant effects on the environment in an EEA State; or where an EEA State is of the view that its environment is likely to be significantly affected by an NSIP.

9.6.3 Annex 1 of Advice Note Twelve sets out the transboundary screening proforma for potential effects on the environment on another EEA member state. Having considered the list, there are no anticipated effects of the project on EEA States and so a transboundary assessment will not be included in the ES.

Table 9.1: Summary of issues scoped in or out of the EIA

Topics scoped in / out	Notes / Justification
Historic Environment	
Scoped In	
Construction phase - activities including compounds, access tracks etc.	This will assess the potential loss of, or damage to, heritage assets as a result of construction activity (e.g. physical removal or disturbance of archaeological remains, where these are still present). Additionally, the assessment will include any effects resulting from changes within the settings of designated and non-designated heritage assets as a result of construction activity (including light and noise). Effects resulting from changes to the wider historic landscape as a result of construction activities will also be considered.
Operational phase	This will assess effects resulting from changes within the settings of designated and non-designated heritage assets as a result of the presence of the solar farm. Additionally, effects resulting from changes to the wider historic landscape as a result of the presence of the solar farm.
Decommissioning phase	The potential effects resulting from changes within the settings of designated and non-designated heritage assets and the wider historic landscape as a result of the decommissioning and removal of the solar farm will be assessed.
Scoped out	
Operation and decommissioning phases - effects on buried archaeological remains	Any effects on buried archaeological remains would occur during the construction phase, as it is during this phase that ground disturbance, including excavation and tracking of vehicles, would occur. This could lead to loss of or damage to archaeological resources. Such effects are considered to be permanent and irreversible. No further groundworks are proposed during the operational phase and no new areas would be affected by decommissioning activities, including vehicle movements. It is therefore proposed to scope out the effects on buried remains during operation and decommissioning phases.
Landscape and visual resources	
Scoped In	
Construction phase – construction activity including delivery and installation	Full LVIA including cumulative assessment will assess the direct impacts upon landscape character as a result of construction activity and construction compounds for a temporary period. Construction would be relatively short in duration and not at the same intensity or across the whole site for the entire period. Additionally, effects for visual receptors using PRoW will be assessed. The intention is that PRoW would remain open during construction and assessment will assess impacts on visual receptors for the temporary construction period.
Operational phase	Full LVIA including cumulative assessment will assess the effects from changes to the landscape character as a result of the solar farm. Key visual receptor groups will be assessed, including: • Residents; • People using public rights of way and Access Land; • Dynamic receptors (e.g. users of roads and railways); • Land-based and water-based receptors engaged in recreational pursuits other than using public rights of way (e.g. people playing golf or sailors); and

Topics scoped in / out	Notes / Justification
	• People at their place of work. Additionally representative viewpoints for most sensitive visual receptors will be agreed with relevant authorities and effects from changes to the views as a result of the solar farm will be assessed.
Decommissioning phase	Full LVIA including cumulative assessment will assess effects resulting from changes to the landscape as a result of the decommissioning and removal of the solar farm will be assessed. This is expected to be similar to effects from a construction phase with the benefit of mature landscape mitigation
Scoped out	
Construction phase -night-time assessment -residential visual amenity assessment	. No permanent lighting is proposed No significant effects expected that would overwhelm existing properties in terms of residential visual amenity nor render properties an unattractive place to live.
Operational phase - night-time assessment - residential visual amenity assessment - study area for landscape and visual effects of >5km radius from edge of site boundary	 No permanent lighting is proposed No significant effects expected that would overwhelm existing properties in terms of residential visual amenity nor render properties an unattractive place to live. No significant effects are expected for highest sensitivity receptors beyond 5 km from the site boundary.
Decommissioning phase -night-time assessment -residential visual amenity assessment	 No permanent lighting is proposed No significant effects expected that would overwhelm existing properties in terms of residential visual amenity nor render properties an unattractive place to live.
Ecology and Nature Conservation	
Scoped In	
Construction and demolition activities	• Effects on designated sites and habitats as a result of construction activity including habitat severance and loss of ecological connectivity, habitat disturbance (e.g. light, noise pollution/ introduction of toxic pollutants), changes to water quality and changes in air quality (emissions from traffic and dust). Effects on species valued as important features of designated sites. • Effects on habitats as a result of construction activity (e.g. habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (e.g. dust, light, noise pollution/ introduction of toxic pollutants), through changes to air and water quality. • Effects on species as a result of construction activity within the Site boundary (e.g. direct killing or injuring of fauna, disturbance and displacement of species (particularly to those sensitive to noise and light disturbance), introduction or spread of invasive species, changes to water quality).
Use of construction compounds and creation of mitigation areas	• Effects on habitats as a result of use of construction compounds and creation of mitigation areas beyond the Site boundary (e.g. habitat loss, habitat severance and loss of ecological connectivity, habitat disturbance (e.g. dust, light,

Topics scoped in / out	Notes / Justification
	noise pollution/ introduction of toxic pollutants), introduction or spread of invasive species (in particular along the River Evenlode and surrounding land), changes to air/water quality). • Effects on species as a result of use of construction compounds and creation of mitigation areas beyond the Site boundary (e.g. direct killing or injuring of fauna, disturbance and displacement of species (particularly to those sensitive to noise and light disturbance), introduction or spread of invasive species)
Operational Phase	• Effects on habitats as a result of operational activity (e.g. habitat loss, habitat severance and loss of ecological connectivity). • Effects on species as a result of operational activity (including light and noise) (e.g. direct killing or injuring of fauna, disturbance and displacement of species (particularly to those sensitive of habitat disturbance), introduction or spread of invasive species.
Scoped out	
Direct habitat loss effects within the boundary of designated sites	Based on the desk study and the site surveys, the following are proposed to be scoped out of the EIA process: • Direct habitat loss effects within the boundary of designated sites (no habitat loss would occur within any of the identified designated sites, at European, national or local level). Therefore, no impact pathway would exist.
Hydrology and flood risk	
Scoped in	
Construction phase – potential increase to flood risk	The construction could directly impact flood risk on adjoining land. A desk based study of the flood risk within all of the West Botley Solar Farm sites will be performed. Specific modelling is proposed to be undertaken to inform this assessment.
Construction phase – potential to increase temporary flood risk	Impacts on flood risk could arise from any change in run-off areas affected by the construction compound and temporary areas. A desk based study of the flood risk within all of the Botley West Solar Farm sites will be performed. Specific modelling is proposed to be undertaken to inform this assessment.
Construction phase - deterioration of water quality in 'Main Rivers' and ordinary surface watercourses	Direct impacts to water quality may occur from construction works in close proximity to watercourses, in addition to as a result of temporary access roads crossing a number of ordinary watercourses and drains. A review of the EA catchment data explorer to identify the WFD classification of watercourses on or within 1km within the sites will be undertaken.
Construction phase – damage to field drainage and infrastructure	The solar farm site is located in a predominantly rural location where construction activities may result in damage to field drainage. The location of field drainage would be established (where possible) through consultations with landowners.
Construction phase – damage to water pipeline infrastructure	Water supply pipelines may be located within the sites, which could be damaged by construction activities, such as the implementation of cables. A desk based study would be undertaken to establish the locations if the water pipes on the sites to see if they would be affected.
Operational phase – deterioration of water quality of 'Main Rivers' and ordinary watercourses	Indirect impacts may occur as a result of leakage of stored materials or spilled materials used during operation and maintenance. A desk-based study of Main Rivers, in particular the chemical and biological objectives set by the WFD, will be completed.

Topics scoped in / out	Notes / Justification
Operational phase – potential increase in flood risk	A desk based study of the food risk area within the three sites, looking at the inverters and DNO buildings will be performed. Specific modelling is proposed to be undertaken to inform this assessment.
Decommissioning – potential increase to flood risk	The decommissioning could directly impact flood risk on adjoining land. A desk based study of the flood risk within all of the West Botley Solar Farm sites will be performed. Specific modelling is proposed to be undertaken to inform this assessment.
Decommissioning – potential to increase temporary flood risk	Impacts in flood risk could arise from any change in run-off areas affected during decommissioning of compounds and temporary areas. A desk based study of the flood risk within all of the West Botley Solar Farm sites will be completed. Specific modelling is proposed to be undertaken to inform this assessment.
Decommissioning - deterioration of water quality of 'Main Rivers' and ordinary watercourses and drains	Direct impacts to water quality may occur from workings associated with the removal of cabling and associated infrastructure. A desk-based study of Main Rivers, in particular the chemical and biological objectives set by the WFD, will be completed.
Scoped out	
n/a	
Ground Conditions	
Scoped in	
Construction phase - land contamination	The proposed construction activities have the potential to mobilise contaminants associated with historical contaminative land use, through the creation of new migration pathways. Groundwater flow patterns and drainage patterns may also be impacted by the operational phase of the Project modifying existing pathways and consequently having potential significant effects on sensitive receptors currently unaffected by contamination sources that may be present.
Construction and operational phase – ground instability	During construction and operational phases there is the potential risk of ground instability as a result of construction disturbance, for example promoting landslips/landslides through slope destabilisation or triggering of potentially unstable natural solution features through vibration in construction or loading or changes of drainage patterns during operation.
Mineral resources	It has been established through scoping that there are a number of land parcels, and also part of the proposed cable route corridor, that fall within areas designated as mineral consultation/safeguarding areas. These are primarily within the boundaries of West Oxfordshire District Council and relate to potential reserves of sand and gravel aggregate. Within the Botley West Central Area the identified mineral consultation/safeguarding areas also extend within Cherwell District Council. The Oxfordshire County Council is the responsible Minerals Planning Authority, and the technical team will review the status of options and safeguarding as part of the PEIR and ES.
Scoped out	
Land parcel specific	The above potential effects scoped in to the assessment of ground conditions may only be applicable for certain land parcels. As such, assessments of land contamination ground instability, and mineral resources will only be completed at appropriate levels for specific land parcels. Where such assessments are not appropriate, they will be scoped out for specific land parcels.
Traffic and Transport	

Topics scoped in / out	Notes / Justification
Scoped in	
Construction phase - increases in traffic flows as a result of construction traffic or works due to, for example, cable trenching, upon driver and pedestrian delay and pedestrian amenity for users of the Local Road Network (LRN) and Strategic Road Network (SRN).	Additional vehicle movements or works required to facilitate construction of the Botley West Solar Farm may impact the effective operation of the LRN, SRN and other transport receptors (e.g., PRoWs) and cause driver and pedestrian delay/impact on pedestrian amenity.
Construction phase - increases in traffic flows as a result of construction traffic or works due to, for example, cable trenching upon community severance for users of the LRN and SRN.	Additional vehicle movements or works required to facilitate construction of the Botley West Solar Farm could limit the mobility/access of users of the LRN, SRN and other transport receptors (e.g., PRoW), causing severance between communities (including community facilities).
Construction phase – temporary delays to public transport services caused by increases in traffic flows as a result of construction traffic or works due to, for example, cable trenching.	Construction of the Botley West Solar Farm may disrupt public transport services (e.g., buses) due to the construction works themselves or additional vehicles movements causing delays.
Construction phase - increases in traffic flows as a result of construction traffic or works due to, for example, cable trenching upon accidents and safety for users of the LRN, SRN and other transport receptors.	Additional vehicle movements required to facilitate construction of the Botley West Solar Farm could impact the safety of users of the LRN, SRN and other transport receptors (e.g., PRoW).
Construction phase - the impact of Abnormal Indivisible Loads (AILs) on the safety of users of the LRN, SRN and other transport receptors.	Construction of the Botley West Solar Farm may require the transportation of AILs, which may impact the safety of users of the LRN, SRN and other transport receptors (e.g., PRoW).
Scoped out	
Operational phase - the impact of additional vehicle movements on the LRN and SRN on driver and pedestrian delay, pedestrian amenity, community severance, public transport delay and accidents and safety.	Operation and maintenance of the Botley West Solar Farm is likely to generate a limited number of additional vehicle movements on the LRN and SRN. The Botley West Solar Farm does not require any manned facilities and requires only infrequent maintenance activities. Therefore, the potential impact of additional vehicle movements on the LRN, SRN and other transport receptors during operation and maintenance of the Botley West Solar Farm is unlikely to result in significant effects and is proposed to be scoped out of the assessment for traffic and transport.
Decommissioning - the impact of additional vehicle movements on the LRN and SRN on driver and pedestrian delay, pedestrian amenity, community severance, public transport delay and accidents and safety.	Decommissioning of the Botley West Solar Farm will generate a lower number of additional vehicle movements on the LRN and SRN than the construction phase. This is because retired infrastructure/ equipment will either be left in situ or transported away from site in bulk, reducing the number of additional vehicle movements required to facilitate decommissioning of the Botley West Solar Farm. In addition, measures to be included in the Construction Traffic Management Plan, updated as necessary, will also be employed during the decommissioning phase. Therefore, the potential impact of additional vehicle movements on the LRN, SRN and other transport receptors during decommissioning of the Botley West Solar Farm based upon future year baseline conditions that could be estimated at this time would be no higher than those impacts during the construction phase and is proposed to be scoped out of the assessment for traffic and transport.

Topics scoped in / out	Notes / Justification
Noise and Vibration	
Scoped in	
Construction phase - noise and vibration from construction activities	The construction of the Project may result in noise and vibration impacts on the noise and vibration sensitive receptors within the proposed study area. An assessment of construction noise and vibration impacts would be undertaken in accordance with the guidance contained within BS 5228:2009+A1:2014: "Code of Practice for Noise and Vibration Control on Construction and Open sites, Part 1: Noise and Part 2: Vibration".
Operational phase - noise from the operation of the development	The operation of the Project may result in noise impacts on the noise sensitive receptors within the study area. An assessment of operational noise impacts from plant and equipment associated with the Project would be carried out in accordance with the guidance contained within BS 4142:2014+A1:2019 "Methods for Rating and Assessing Industrial and Commercial Sound".
Construction and operational phases - noise from construction and operational phase traffic, if applicable	An assessment of potential noise impacts arising from any changes in traffic flows as a result of the construction and operation of the project will also be undertaken where applicable.
Scoped out	
Baseline vibration survey	Based on the initial desk-based review of the site locations and surrounding areas there are unlikely to be significant existing sources of vibration in the vicinity of the Site and closest noise and vibration sensitive receptors. As such, a baseline vibration survey should not be required. Where necessary, appropriate levels of mitigation would be identified, in accordance with best practice, to ensure that noise and vibration levels are acceptable during the construction and operation phases.
Operational phase - vibration impacts	Operation of the Project is not likely to produce substantial levels of vibration since vibration is likely to be controlled at the source as part of the plant design since vibration isolation measures will be included as part of the plant design. Therefore, it is proposed to scope out an assessment of vibration impacts during the operational phase.
Decommissioning phase - noise and vibration	Noise and vibration impacts during decommissioning are likely to be similar or less significant than the impacts during construction. Therefore, a separate assessment of decommissioning impacts should not be required.
Noise and vibration impacts on ecology	Noise and vibration impacts on ecology would be considered within the Ecology chapter of the PEIR/EIA Report based on input from the measured noise and vibration data, calculations, and assessment results.
Climate change	
Scoped in	
The impact of life-cycle GHG emissions from the solar farm	Life-cycle greenhouse gas (GHG) emissions refers to two main elements: embodied carbon, and operational GHG emissions/savings, descriptions of which are provided below: **Embodied carbon -** Encompasses the manufacturing-stage emissions caused directly and indirectly from sources at a variety of locations, including those resultant from on-site activities, and from the upstream supply chain of the materials used. The embodied carbon of the Project will be assessed using published literature values from lifecycle assessments (LCAs) and Environmental Product Declarations (EPDs). This is likely to include manufacturing, transport and installation of the photovoltaic (PV) modules and balance of system (BoS) components (primarily inverters, transformers and cabling). **Operational –** Electricity generated by the Project will result in the displacement of higher carbon intensity electricity generation sources, resulting in emission savings. Such avoided emissions will be assessed based on the carbon intensity of the alternative source of generation that is displaced, i.e., the generators that would have been supplying the grid with

Topics scoped in / out	Notes / Justification
	electricity in the business-as-usual baseline without the Project. Hence, the emissions savings would be compared with both the present-day average carbon intensity of electricity generation on the UK National Grid at the time of the assessment and future marginal generation intensity predictions, calculated by BEIS[4]. Both baselines would be used since, on the one hand, the carbon intensity of electricity generation is expected to decrease in line with government policy, and so the intensity of the marginal generation source that the Project would displace would also reduce. However, this reduction in carbon intensity would only be possible through the approval and construction of projects such as the Project, and government policy relies on projects such as these to be approved. As such, projected decarbonisation scenarios should not be accepted with complete certainty. It is likely that the true value of avoided emissions would fall within a range between the two scenarios. Operational emissions savings will then be set within the context of national carbon budgets and other relevant local or national policy requirements, as recommended by the most recent IEMA guidance[5].
Climatic changes that may affect generating capacity of the PV system.	Climatic changes which could impact the generating capacity of the PV system across the Project's operational lifetime, namely any future projected changes in cloud cover or sunlight hours, will be considered using UKCP18 projections[6].
Scoped out	
Climate Risk	**Overview:** Risks from climate change are proposed to be scoped out of the assessment, as these are not considered likely to be significant during the Project's operating lifetime (42 years). Justification for specific climate risks being scoped out has been provided below. **Increased ambient temperatures:** the manufacturing standards for PV modules require them to be functional over a wide range of temperatures, humidity and UV radiation. As such, the potential for efficiency losses due to hotter temperatures during the Project's lifetime are not considered to have any potential to significantly affect the lifecycle GHG emissions, and thus will not significantly reduce the environmental effect of the renewable electricity generation. **Extreme weather events:** Whilst it is likely the Project will be subject to extreme weather events such as storms and high winds across its operational lifetime, it's design will need to account for this. Manufacturing standards for PV modules require consideration for extensive weathering (such as from hailstorms) and extreme thermal fluctuations. As such, extreme weather events are not considered to cause significant environmental effects to the Project. **Flood Risk:** Flood risk will be assessed, with appropriate climate change allowance, in the Flood Risk Assessment for the Project. As such, no separate assessment is proposed to be included within the climate change chapter.
GHG emissions from land use change.	GHG emissions resulting from land-use change during construction are likely to be insignificant. This is due to the current agricultural land use and minimal disturbance during installation of solar PV modules and BoS components. Further,

[4] BEIS (2022). Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal. [Online] https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal

[5] IEMA (2022) Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance. 2nd Edition. [Online] Available at: https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions

[6] MOHC (2018): UK Climate Projections project (UKCP18). [Online] Available at: https://ukclimateprojections-ui.metoffice.gov.uk.

Topics scoped in / out	Notes / Justification
	carbon sequestration through biogenic growth during the operational period of the Project would also likely be insignificant compared to the magnitudes of GHGs emitted and avoided during the construction and operational phases of the Project[7].
GHG emissions associated with decommissioning of the Project.	The vast majority of emissions associated with solar PV developments arises in the construction stage, from the embodied carbon of the PV modules and BoS components[8]. As such, GHG emissions from decommissioning will be minimal in comparison.
Socio-Economics	
Scoped in	
Construction & decommissioning phase – employment	The Project will create direct and indirect jobs throughout the construction phase. The number of such jobs may be significant given the scale of construction.
Construction & decommissioning phase – economic output	The creation of jobs at construction stage will improve Gross Value Added (GVA) and increase spend in the local economy. Given the scale of the Project, this is considered likely to have a significant impact.
Construction & decommissioning phase – education / skills	The construction stage provides an opportunity for skilling up the workforce.
Construction & decommissioning phase – transport / commuting patterns	There is potential for temporary adverse effects to arise from disruption as a result of increased traffic during construction. In addition, road closures could impact commuting patterns. Further assessment of potential impacts is considered appropriate.
Operational phase – employment	The maintenance of the Project will require and support the creation of a dedicated work force on a regular basis. Indirect employment may also arise once the Scheme is finalised. Job security and the creation of jobs would be considered a positive socio-economic contribution.
Operational phase – economy	GVA associated with the direct, indirect, and induced jobs over lifetime of development can benefit the local economy.
Operational phase – land use	Economic impact of the displacement of agricultural land uses for the duration of the Scheme could be significant. Any impact on agricultural output should be fully considered and compared with the economic benefit of proposal.
Operational phase – tourism	There is some potential that the Project could impact the visual amenity of some tourist destinations. This is a key policy driver for the area, and has been raised as an important consideration as part of stakeholder engagement exercise.
Operational phase – education and skills	There are opportunities to include education points within the Project to improve knowledge of renewable development, and for a skills plan to be produced to 'skill up' existing workforce.
Scoped out	
Construction & decommissioning phase – temporary workers accommodation	The construction stage could result in some increased demand for accommodation comprising temporary bed & breakfast or short-term rentals for specialist contractors. It is assumed that the majority of construction workers are likely to reside

[7] Bai, Yongfei and Cotrufo, Francesca M. (2022). Grassland soil carbon sequestration: Current understanding, challenges, and solutions. Science 377, 603-608. https://www.science.org/doi/epdf/10.1126/science.abo2380

[8] International Energy Agency (2021). Environmental Life Cycle Assessment of electricity from PV systems fact sheet. [online] https://iea-pvps.org/wp-content/uploads/2021/11/IEA-PVPS-Task12-LCA-PV-electricity-_-Fact-Sheet.pdf

Topics scoped in / out	Notes / Justification
	within their current locations, due to good road linkages and accessibility at a local and regional level to the site. As such there is unlikely to be a significant increase in demand for this type of accommodation.
Construction & decommissioning phase – recreation activities	Works may lead to temporary disturbance at public open spaces and disruption of public rights of way (PRoW), potentially affecting recreational activities. However, this will be covered within Human Health chapter. Not considered to have significant socio-economic impact.
Construction & decommissioning phase – land use	Impacts associated with land use and agricultural output are more relevant to the operational phase of development and not considered to be significant at the construction stage.
Construction & decommissioning phase – tourism	There is some potential for impact to tourist assets during construction, but this is not considered to be significant. It is likely that potential short-term impacts to the tourist economy at construction stage would be outweighed by the spend of construction workers.
Construction & decommissioning phase – open space / public rights of way	The construction works may impact upon access to open space or public rights of way; however, these impacts will be covered within the Human Health chapter and are unlikely to have any significant socio-economic impacts.
Construction & decommissioning phase – health, social care	During construction, local health care services could be affected or demand for these services could increase. There is potential for a direct adverse impact on health during construction, however, any human health effects will be assessed within the human health and well-being chapter and can, therefore, be scoped out of the socio-economic reporting.
Construction & decommissioning phase – crime and safety	It is assumed that security arrangements for the Project will be in line with the requirements set out the Construction (Design and Management) Regulations and appropriate levels of security (personnel / PIR sensors) will be appointed. Therefore, there is unlikely to be a significant effect in relation to crime and safety.
Operational phase – housing	The proposed scheme could have potential impacts on house values and amenity of residents. Unlikely to have any significant impact, and proposals only temporary.
Operational phase – human health and wellbeing	Potential benefits arising from improved accessibility to the countryside. This will be covered in human health and well-being chapter.
Operational phase – crime	The proposed scheme is unlikely to affect the crime profile of the area.
Operational phase – transport / commuting patterns	Once complete there may be some potential changes to public transport routes. This is not considered to have a significant impact upon socio-economic profile. Impacts will be covered in transport chapter.
Operational phase – recreation	There are opportunities to enhance access to recreational activities in the countryside as a result of the proposals, through nature trails etc. Potential to have significant health benefits which will be covered within Human Health Chapter. Unlikely to have any significant socio-economic impact.
Operational phase – open space / public rights of way	Changes or improvements to access to public open space and public rights of way have the potential to have significant health benefits. These will be covered within the Human Health Chapter. Unlikely to be any significant socio-economic impact.
Human Health	
Scoped in	
Construction, operation and decommissioning phases – diet and nutrition	Loss, albeit temporary but long-term, of agricultural land (including a potential change in the mix of arable and livestock farming) has the potential to impact food production and availability at a local context. This issue is scoped in for potential effects on access to affordable local healthy food (e.g. local farmers markets). This issue may be scoped down if findings of

Topics scoped in / out	Notes / Justification
	the Agricultural Land and Soils assessment, when taking into account factors such as resting agricultural soils and the relative importance of affected land for production to local markets, indicates a scale of change in food price or availability that is unlikely to result in significant health effects at a population level.
Construction and decommissioning phases – open space, leisure and play	Works may lead to temporary disturbance at public open spaces and disruption of public rights of way (PRoW), potentially affecting recreational activities.
Operational phase – open space, leisure and play	Operational land-take relates predominantly to agricultural land, and does not reduce community open spaces designated for recreation, leisure or play. During operation, potential changes to open space include: the beneficial effects of the proposed new recreational routes and increased access to the open countryside, as well as potential adverse effects of the temporary but long-term change of context of existing routes that may cause behavioural change in recreation.
Construction and decommissioning phases - transport modes, access and connections	There is the potential that construction works, including cable laying along roads, and construction vehicles may disrupt local vehicle traffic (private and public transport) as well as active travel (pedestrians and cyclists). The following issues are therefore scoped in: routine or emergency health related journey travel times; access to health promoting goods and services; community severance; and road safety.
Operational phase - community identity, culture, resilience and influence	The visual impact of the solar farm and substation is scoped in to consider the potential for the introduction of visual change in the landscape to influence community context to an extent that could significantly affect population mental health and wellbeing. This scope also considers the project's influence on community identity as a beneficial visual cue that society is responding to the locally declared climate change emergency. These issues may be scoped down if findings of the Visual Impact Assessment, when taking into account the schemes' design and secured landscaping mitigation, indicates a scale of visible change that is unlikely to result in significant health effects at a population level.
Construction and decommissioning phase – education and training	The project would support upskilling and career development in relation to its workforces. This may include apprenticeships and adult learning. Even though the workforces may be not of a scale to result in significant education and training opportunities (e.g. local apprenticeships) for the general population, there may be opportunities to target vulnerable groups. Such effects are scoped in to consider how benefits, including for local and vulnerable groups, could be enhanced.
Construction, operation and decommissioning phases – employment and income	The project provides opportunities for good quality employment, which are scoped in. Even if the direct employment opportunities may be not of a scale to have significant health effects for the general population, there may be opportunities to target vulnerable groups with potential for significant benefits from reduced inequalities. The health chapter will consider the potential population health effects of direct and indirectly employment, including opportunities to enhance benefits for local and vulnerable groups. Any potential unemployment or adverse economic implications are also scoped in, for example, the project's effects on local businesses.
Operational phase – climate change and adaptation	Operation of the Project will provide a positive climate adaptation in the form of renewable energy generation. The project would be a part of an energy sector transition that reduces the severity of climate change. The benefits to population health will be discussed, including reducing adverse physical and mental health effects of climate change for deprived populations, particularly in low- and middle-income countries globally.
Construction and decommissioning phases – air quality	Construction and decommissioning activities have the potential to result in localised dust and construction traffic emissions. This issue is scoped in with potential to scope it down depending on the findings of the ES Air Quality chapter. The health chapter will be informed by the air quality modelling undertaken for the project. UK statutory limits, i.e. health protection standards, will be used as a benchmark. The potential for non-threshold health effects of some air pollutants will be discussed and taken into account.
Construction and decommissioning phases – noise and vibration	Construction and decommissioning activities, albeit temporary and transient at any given location, are scoped in. The health chapter will be informed by the noise and vibration assessment of changes to daytime and night-time noise.

Topics scoped in / out	Notes / Justification
	Consideration will be given to population health effects, for example related to annoyance and sleep disturbance. This issue may be scoped down based on findings of the noise and vibration assessment. For example, if it is clear that elevated noise levels would be avoided through standard best practice noise and vibration mitigation measures that would be secured through management plans. UK regulatory standards will be used as a benchmark.
Operational phase – noise and vibration	The potential operational noise effects of the substation are scoped in to consider the potential for a population health effect. This issue may be scoped down based on findings of the noise and vibration assessment. For example, if it is clear that elevated noise levels would be avoided through secured design, such as acoustic housings, technology selection or noise barriers.
Operational phase – radiation	Actual electro-magnetic field (EMF) risk to population health is scoped out on the basis that the project would adopt the International Commission on Non-ionizing Radiation Protection (ICNIRP) guidelines and Government voluntary Code of Practice on EMF public exposure. Such considerations are inherent to the detailed engineering considerations of cable specification and routing. Relevant public EMF exposure guideline limits are noted in NPS EN-5 and would be complied with by the project. These guidelines are long standing and have a high safety margin. The levels of exposure that they require would not pose a risk to public health. In line with good practice, public understanding of risk in relation to operational EMF are scoped in. The assessment will provide reassurance on the safety of the electrical infrastructure and avoid / reduce any widespread community concern that could affect mental health. This includes considering the potential for mental health effects and how these can be avoided or reduced through provisions of timely and non-technical information on how actual health risks are mitigated.
Operational phase – wider societal infrastructure and resources	During operation, the project's wider societal contribution to supporting public health is scoped in. The project would provide energy infrastructure that supports many aspects of public health. A reliable supply of electricity is required in relation to factors including, population food safety, thermal conform, healthcare, learning, income generation and social networking.
Scoped Out	
Construction, operation and decommissioning phases – physical activity	Physical activity is an important determinant of health. However, to avoid duplication this issue is addressed under 'open space, leisure and play'.
Construction and decommissioning phases – risk taking behaviour	Issues of community health behaviours being detrimentally affected by the presence of the workforce are scoped out. This reflects a workforce of professionals who are assumed to return to their usual place of residence during periods of leave. The workforce is unlikely to be sufficiently large in number to affect local markets, e.g. for alcohol, cigarettes or gambling, to an extent which could significantly affect community health. Healthy workforce behaviour would be encouraged through a workforce management plan. There is not considered to be the potential for a likely significant population health effect.
Operational phase – risk taking behaviour	It is anticipated that the operational workforce engaged in checks and maintenance activities will be smaller in number and more locally resident. Healthy workforce behaviour would be encouraged through a workforce management plan. There is not considered to be the potential for a likely significant population health effect.
Construction and decommissioning phases - housing	The majority of workers are assumed to be based in the regional area, returning to their usual place of residence when not working. Where temporary accommodation is required, this would be provided on site, or potentially via existing B&B/hotel bed spaces, as is typical for the construction industry. It is not expected that use of temporary accommodation would be on a scale to significantly: displace local residents; adversely affect seasonal tourism; or otherwise affect housing availability. There is not expected to be a loss of residential housing or permanent loss of outdoor spaces associated with dwellings.
Construction and decommissioning - community identity, culture, resilience and influence	Demographic changes that could affect community identity are not anticipated, as there would not be a large in-migration or out-migration of workers to local communities. Additionally, transient impacts of the Project, such as the use of

Topics scoped in / out	Notes / Justification
	construction barriers, lighting or signage, are not expected to disrupt community identity or community gatherings to an extent that could affect population health. Temporary employment opportunities are not expected to have a strong influence community identity. These issues are scoped out.
Operational phase – housing	The operational workforce is expected to be smaller in number and more locally resident. The solar farm and the substations are relatively low impact in terms of built form. This issue is scoped out on the basis of anticipated sensitive design, but the human health assessment will keep a watching brief on the socio-economic assessment. Only if widespread significant blight effects are identified in the socio-economic assessment will this issue be included in discussion within the health assessment.
Construction, operation and decommissioning phases – relocation	Works would likely not involve compulsory land purchases of homes or community facilities. This issue is scoped out.
Construction and decommissioning phases – community safety	Where surface excavations are undertaken these would be within controlled work areas, including use of appropriate fencing and notifications as required. Best practice measures would be secured through suitable management plans. The risk to the public from accidental injury, e.g. falls is scoped out. The project workforce requires skilled technical roles. There are not anticipated to be community safety or security issues associated with worker behaviour in communities. The project would operate appropriate safeguarding and modern slavery policies. The potential for widespread actual or perceived crime that could affect population health is unlikely.
Operational phase – community safety	Operational impacts on community safety from a project of this nature are likely to be related to changes in crime or fear of crime. Given the rural context of the Project, no such impacts are anticipated. Electrical risks to the public would be avoided though the design, including fencing of above ground electrical infrastructure.
Operational phase - transport modes, access and connections	Minimal operational traffic and impacts on road users are anticipated during operation of the Project. It is unlikely that activity associated with checks and maintenance would have the potential for significant population health effects due to changes in routine or emergency health related journey travel times; access to health promoting goods and services; community severance; or road safety. This issue is scoped out, but the human health assessment will keep a watching brief on the transport assessment. Only if significant adverse effects are identified in the transport assessment will this issue be included in discussion within the health assessment.
Construction, operation and decommissioning phases – social participation, interaction and support	The project will not directly affect land used for community interaction (e.g. meeting places, village greens, community centres etc that promote community voluntary, social, cultural or spiritual participation). Any indirect impacts on access to such spaces is addressed under the “Transport modes, access and connection” health determinant. This issue is scoped out. Whilst project wide consultation for the project is likely to support community empowerment and voice, allowing for all viewpoints to be heard and discussed, this is not considered to be of a scale that would result in significant population health effects. The community response to landscape change are discussed under ‘community identity’.
Construction and decommissioning phase – education and training	Whilst some elements of education and training during the construction and decommissioning phases have been scoped in and included above a large influx for workers, including those bringing families, is not expected, so changes to educational capacity or quality are unlikely and are scoped out.
Operational phase – education and training	Operational phase – education and training Operational education and training opportunities are not expected to be on a scale that could influence population health, even with benefits targeted to vulnerable groups. This issue is scoped out.
Construction, operation and decommissioning phases – employment and income	Elements of employment and income during construction, operation and decommissioning that have been scoped into the human health assessment are discussed above. However, the following issues have been scoped out:

Topics scoped in / out	Notes / Justification
	• The project's supply chain would be expected to operate appropriate policies that safeguard against significant population challenges to equality, health and safety, for both workers and, as appropriate, the public. These issues are scoped out. • The project would operate appropriate employment equality policies but is not expected to influence how employment affects family structures and relationships in local populations, and as such, this issue is scoped out. • Occupational working conditions include risks that are appropriately managed through health and safety policies and practices. Project activities are not expected to differ from industry norms. These issues are scoped out.
Construction and decommissioning phases – climate change and adaptation	Embodied carbon and climate altering pollutant emissions are not of a scale to have the potential for population level effects associated with climate change.
Operational phase – air quality	Operational air quality effects (e.g. maintenance vehicle emissions) are not anticipated to be of a scale, even accounting for non-threshold effects, that could affect population health.
Construction and decommissioning phases – water quality or availability	Pollution of surface water (including Farmoor Reservoir) or groundwater bodies used as potable sources could affect the quality or availability of drinking water. Furthermore, the works are predominately in or adjoining agricultural land and food safety could also be compromised by contamination of agricultural water sources. Activities are unlikely to impact bathing waters. However, for all pathways, the project would adopt standard best practice spill avoidance and response measures that would be secured through management plans. Pollution risk issues are therefore scope out on the basis of the anticipated effectiveness of such measures, but the human health assessment will keep a watching brief on the water assessment. Only if significant adverse effects are identified in the Hydrology and Ground Conditions chapters will this issue be included in discussion within the health assessment.
Operational phase – water quality or availability	Checks and maintenance activities are unlikely to result in any water related risks to public health. Any risks would be managed through standard best practice spill avoidance and response measures that would be secured through management plans. Operational effects on water quality and availability are not anticipated to be of a scale that could affect population health.
Construction and decommissioning phases – land quality	Construction and decommissioning activities will involve limited excavation. Risks of new or historic pollutant mobilisation, including direct exposure and food contamination, are highly likely to be addressed by standard good practice mitigation measures that would be secured through management plans, including to mitigate against dust and aerosol exposure pathways. This topic is scoped out, but a watching brief will be kept on the soils assessment to confirm this scoping conclusion remains appropriate. Only if significant adverse effects are identified in the Agricultural Land and Soils chapter will this issue be included in discussion within the health assessment.
Operational phase – land quality	Checks and maintenance activities are unlikely to require excavations or result in land quality related risks to public health. Any risks would be managed through standard best practice contamination avoidance and response measures that would be secured through management plans.
Operational phase – noise and vibration	Whilst other elements of operational noise and vibration have been scoped in and discussed above checks and maintenance activities are not expected to result in noise and vibration levels that could affect population health. This issue is scoped out.
Construction and decommissioning – radiation	Non-ionising electro-magnetic field (EMF) effects are scoped out. Works would not include using, or making changes to, active major electrical infrastructure producing EMF. Relevant public and occupational safeguards, secured through management plans, would be followed for the temporary electrical equipment used. Electric and magnetic fields strengths

Topics scoped in / out	Notes / Justification
	reduce rapidly with distance, often requiring only a few meters separation between the source and receptor, to reach background levels. No ionising radiation sources are proposed.
Construction and decommissioning phases – wider societal infrastructure and resources	The project's energy infrastructure would not generate public health benefits at this stage.
Construction, operation and decommissioning phases – health and social care services	Effects on health and social care are scoped out. The project workforce is assumed to include a high proportion of people who are resident in the regional area. The UK workforce would have NHS entitlement irrespective of place of residence. UK workers away from their usual place of residence for a prolonged period would be able to register with local primary healthcare on a temporary basis. This would facilitate NHS funding for their care. Any multinational members of the workforce are assumed to be covered by health insurance provisions that would allow the NHS to recoup costs to an extent that avoided any significant adverse effect on healthcare services. This is routine practice across industries and sectors. The project program and workforce assumptions support routine NHS service planning. The project will operate appropriate occupation health services. It is not expected that a high proportion of workers would move to the area with dependants requiring social care. Health protection measures such as screening and immunisations are expected to continue from the workers' usual place of residence. Similarly routine dental appointments are assumed to be with the worker's dental practice close to their usual place of residence. Other health services are not expected to be affected as no largescale in-migration is expected and the workforce of skilled technical roles would return to their usual places of residence when ashore.
Construction and decommissioning phases – built environment	The potential for the project to affect existing features of the built environment that are supportive of population health has been considered and scoped out. In constructing the export cable route, trenchless techniques or other measures will be used where possible to avoid surface disruption at sensitive features such as roads, watercourses, rivers etc. Similarly, the position of existing services, such as water and sewer systems will be taken into account in planning the export cable corridor and techniques used. Appropriate diversions would occur to avoid disruption to such services. This issue is scoped out. Should works impact utilities (e.g. during cable burying), diversions will be included as secured by the CMP.
Operational phase – built environment	The Project would introduce new but temporary elements in the built environment. This is assessed under the "community identity" health determinant. Operational activities are not considered to have waste management, land use or infrastructure use implications on a scale that could affect population health.
Agriculture land & soils	
Scoped in	
Agricultural land and land use including the loss of BMV (Best Most Versatile) land	The assessment of the likely effects on these resources will consider the following activities: • Identification of all agricultural land and soil receptors that have the potential to be affected by the Project and the provision of a description of those resources and their importance and/or value; • Identification of the likely impacts of the Project on agricultural land and soil resources within the study area; • Assessment of significance of effects, taking into account measures proposed to avoid, reduce or remedy adverse effects.
Quality of soil resources in terms of potential for disturbance/damage or improvement through changes in land management	
Potential Loss of Soil Resources	
Scoped out	

Topics scoped in / out	Notes / Justification
Decommissioning effects	It is proposed that the decommissioning effects are scoped out for the agricultural land and soils topic. Although the full details of the likely decommissioning works are not known at this stage, they would be expected to be similar to, or of a lower magnitude of impact than those during the construction stage. It is therefore proposed that the decommissioning effects be considered the same as for those during the construction period and would therefore be scoped out for a specific assessment within the ES.

10 STRUCTURE OF THE ES

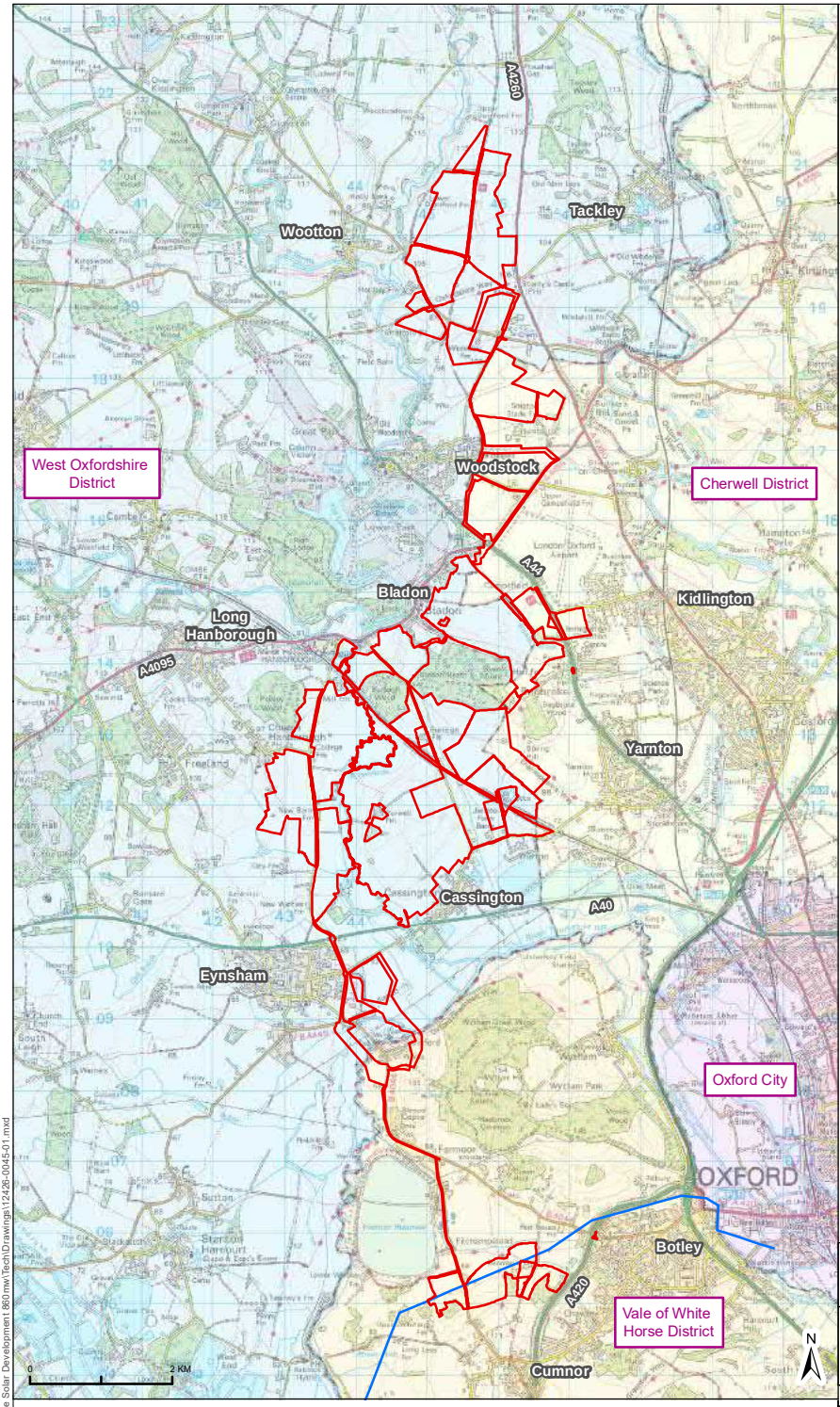
10.1.1 The EIA process will be managed by RPS, accredited members of the IEMA Quality Mark. Information about the Project will be provided by PVDP. Each topic assessment will be undertaken by competent experts in that subject, as indicated below.

10.1.2 Table 10.1 sets out the proposed structure of the ES, together with the main author responsible for the assessment.

Table 10.1: Proposed ES Structure

Volume/Chapter	Topic	Author
Non-Technical Summary: Summary of the ES using non-technical terminology		
Volume 1: Text		
Chapter 1	Introduction	RPS
Chapter 2	Existing Baseline	
Chapter 3	Consenting Process	
Chapter 4	Approach to Environmental Assessment	
Chapter 5	Need and Alternatives Considered	RPS
Chapter 6	Project Description	RPS
Chapter 7	Historic Environment	
Chapter 8	Landscape and Visual Resources	RPS
Chapter 9	Ecology and Nature Conservation	RPS
Chapter 10	Hydrology and Flood Risk	RPS
Chapter 11	Ground Conditions	RPS
Chapter 12	Traffic and Transport	RPS
Chapter 13	Noise and Vibration	RPS
Chapter 14	Climate Change	RPS
Chapter 15	Socio-economic	RPS
Chapter 16	Human Health	RPS
Chapter 17	Agricultural Land Use and Soils	RPS
Chapter 18	Cumulative Effects and Inter-relationships	Assessment team
Chapter 19	Summary of Effects	RPS
Volume 2: Figures		
Figures/drawings to support Volume 1		
Volume 3: Appendices		
Technical appendices to support Volume 1, including technical reports covering: ▪ Air Quality ▪ Glint and Glare		

FIGURES



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LEGEND

- Order Limits
- 400kv OHL

Local Planning Authorities

- Cherwell District
- Oxford District (B)
- Vale of White Horse District
- West Oxfordshire District

PHOTOVOLT DEVELOPMENT PARTNERS

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Figure Number	Rev
1	-

VER	DATE	DETAILS	BY	CHECK

Client	PVDP	Status	Drawn By	PM/Checked By
Project	Botley West Solar Farm	Final	JM	MB
Title	Site Location Plan	Project Number	Scale @ A3	Date Created
		NP12426	1:100,000	MAY 2023

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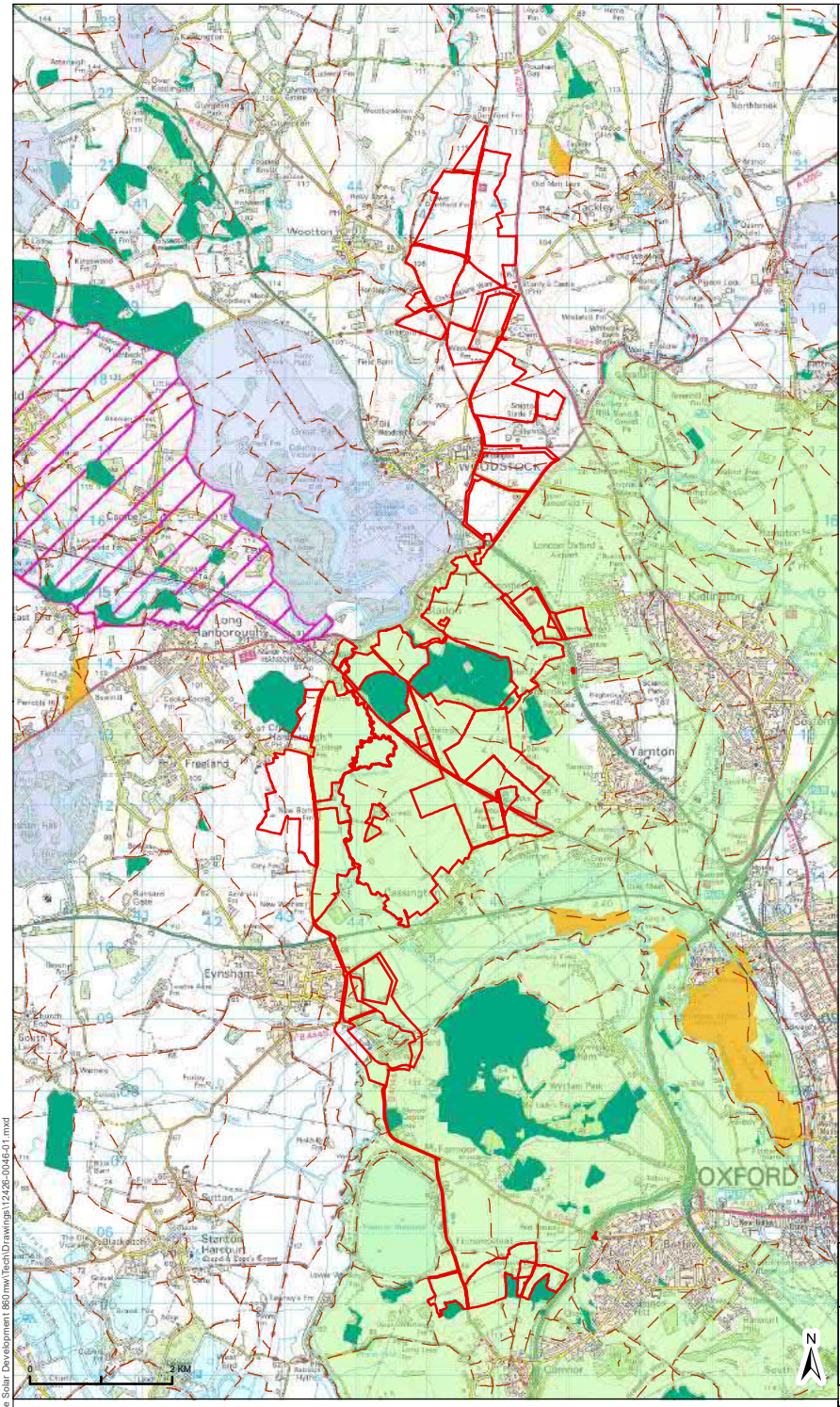

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LEGEND

- Order Limits
- Green Belt
- Parks and Gardens
- CRoW Access Land
- Ancient Woodland
- Area of Outstanding Natural Beauty
- Public Right of Way

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Figure Number	Rev
2	-

VER	DATE	DETAILS	BY	CHECK

Client	PVDP	Status	Drawn By	PM/Checked By
Project	Botley West Solar Farm	Final	JM	MB
Title	Landscape Designations and Green Belt	Project Number NP12426	Scale @ A3 1:100,000	Date Created MAY 2023

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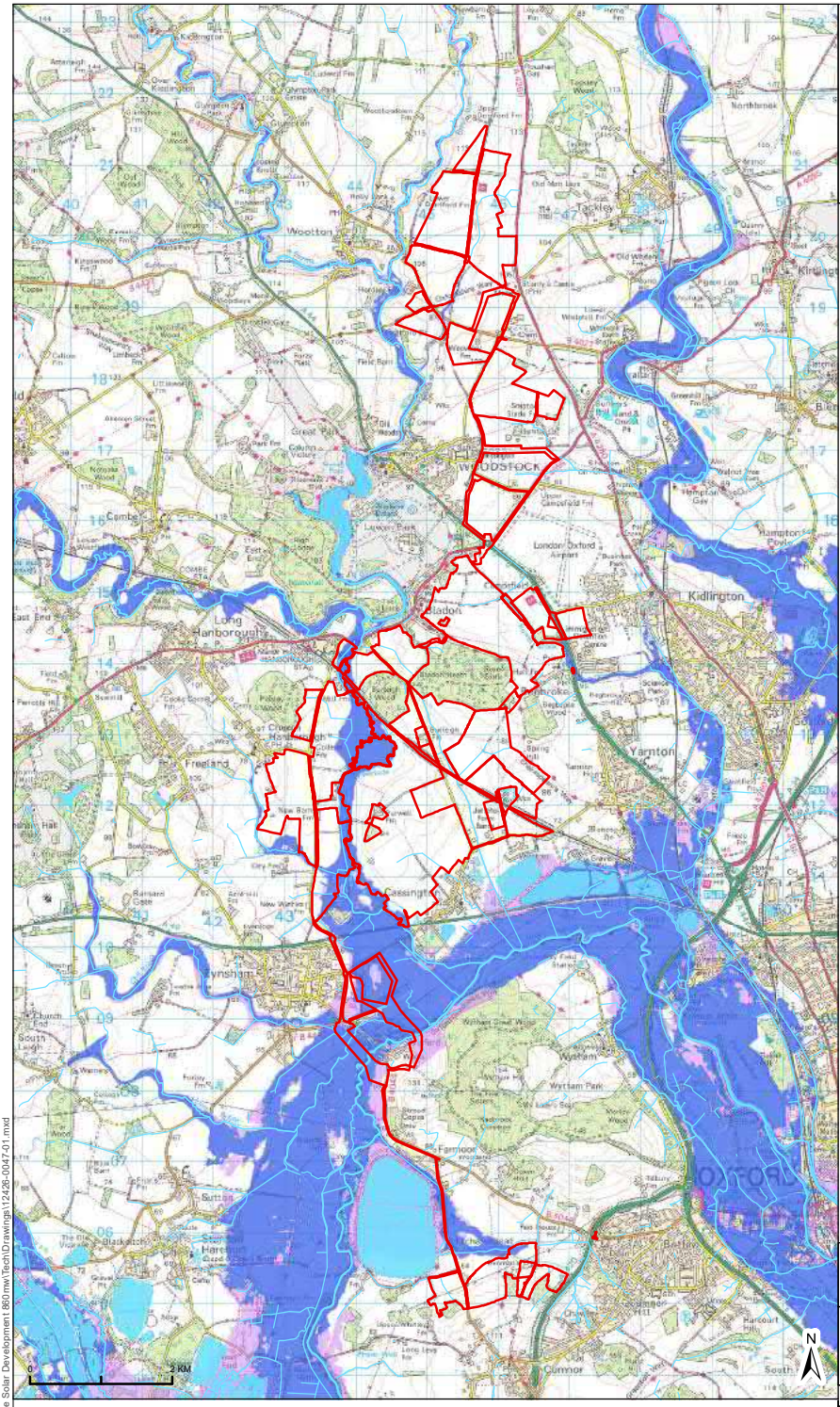

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LEGEND

- Order Limits
- Surface Water and Rivers
- Flood Zone 2
- Flood Zone 3

PHOTOVOLT DEVELOPMENT PARTNERS

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Figure Number	Rev
3	-

VER	DATE	DETAILS	BY	CHECK

Client	PVDP	Status	Drawn By	PM/Checked By
Project	Botley West Solar Farm	Final	JM	MB
Title	Flood Risk and Water Resources	Project Number NP12426	Scale @ A3 1:100,000	Date Created MAY 2023

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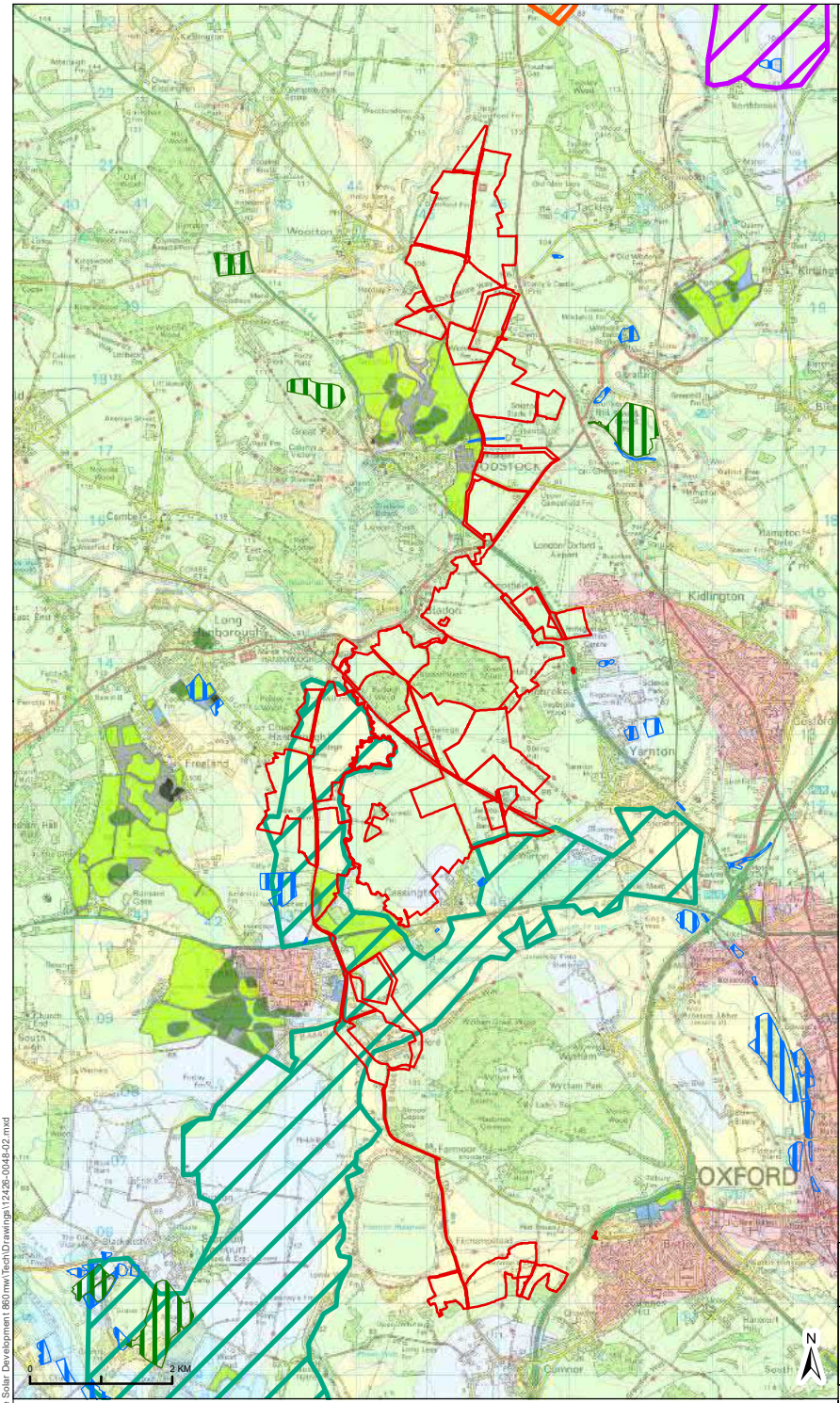

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LEGEND

- Order Limits
- Permitted Waste Sites
- Historic Landfill Sites

Provisional Agricultural Land Classification

- Grade 2
- Grade 3
- Grade 4
- Urban

Agricultural Land Classification Grades Post 1988

- Grade 2
- Grade 3a
- Grade 3b
- Grade 4
- Not Surveyed
- Other

Mineral Safeguarding Zones

- Crushed rock
- Sharp sand and gravel
- Soft sand

PHOTOVOLT DEVELOPMENT PARTNERS

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Figure Number	Rev
4a	-

VER	DATE	DETAILS	BY	CHECK

Client	PVDP	Status	Drawn By	PM/Checked By
Project	Botley West Solar Farm	Final	JM	MB
Title	ALC and Mineral Safeguarding Zones	Project Number	Scale @ A3	Date Created
		NP12426	1:100,000	MAY 2023

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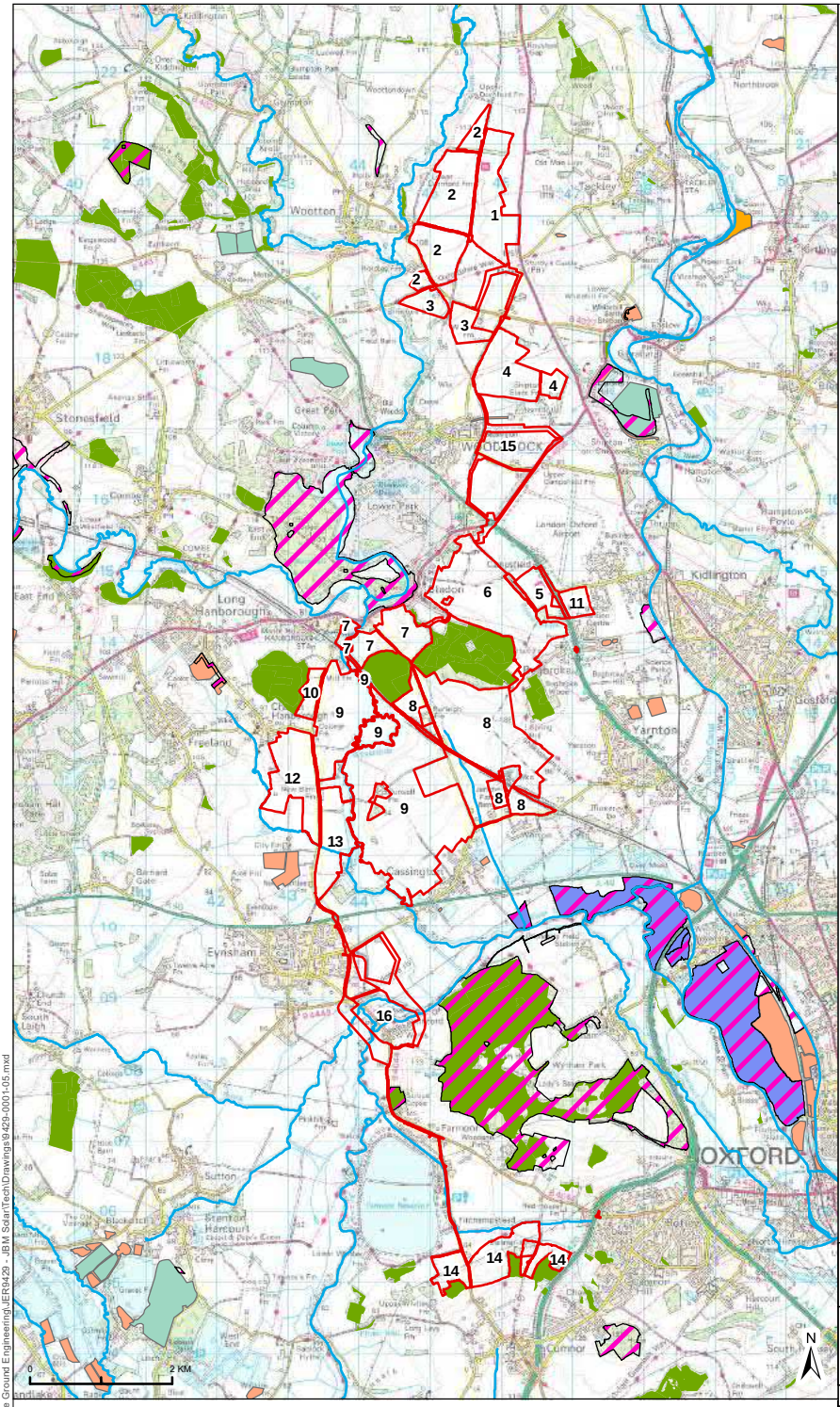

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LEGEND

- Order Limits
- WFD Water Bodies
- Local Nature Reserve
- Site of Special Scientific Interest
- Special Area of Conservation
- Ancient Woodland
- Permitted Waste Sites
- Historic Landfill Sites

PHOTOVOLT DEVELOPMENT PARTNERS

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Figure Number	Rev
4b	-

VER	DATE	DETAILS	BY	CHECK

Client	PVDP	Status	Drawn By	PM/Checked By
		Final	JM	MB
Project	Botley West Solar Farm	Project Number	Scale @ A3	Date Created
		NP12426	1:100,000	JUN 2023
Title	Land Parcels with Constraints			

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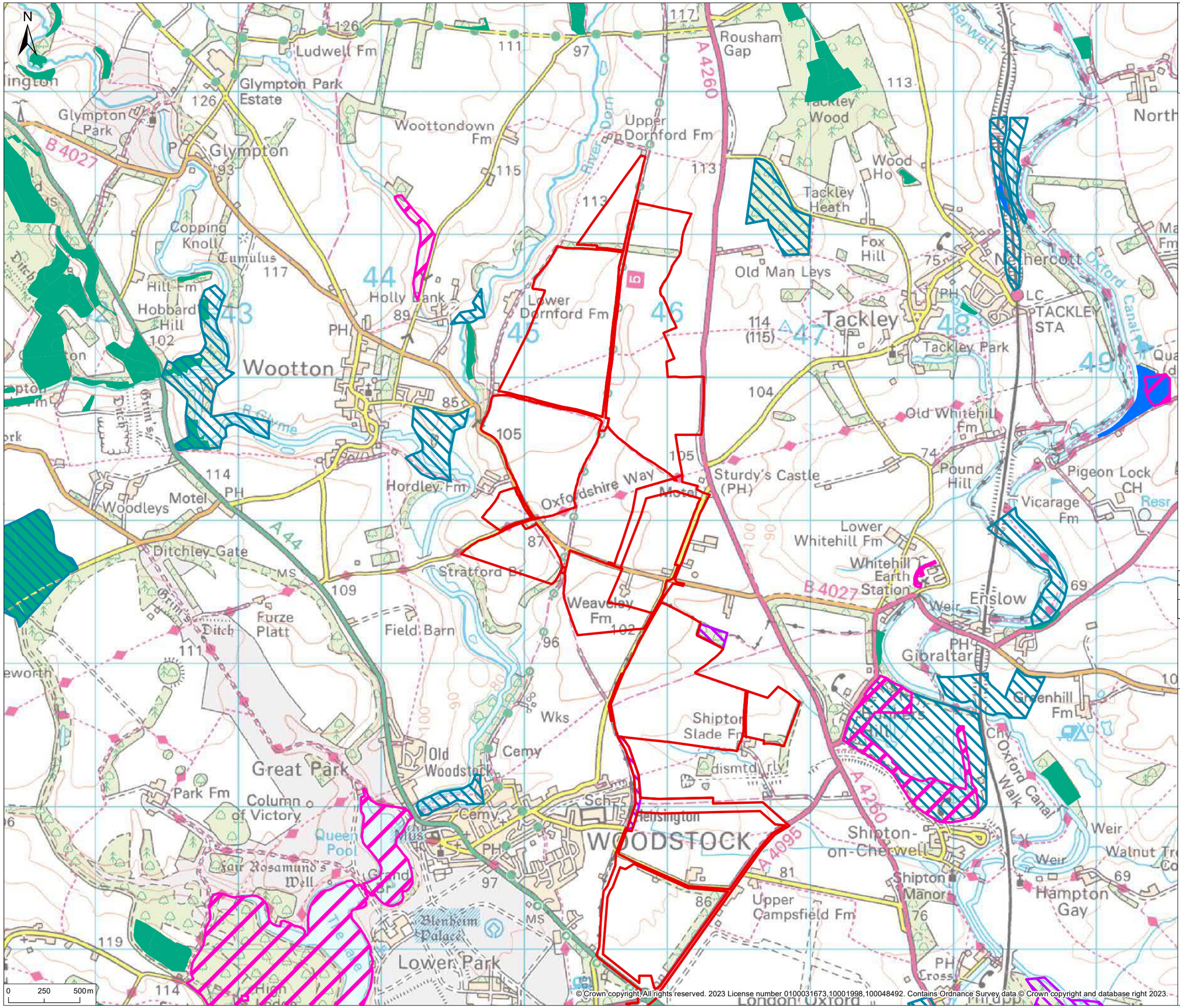

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Legend

- Order Limits
- Ancient Woodland
- Local Nature Reserve
- Site of Special Scientific Interest
- Cherwell District Wildlife Site
- Oxfordshire Local Wildlife Site

Rev	Description	By	CB	Date

PHOTOVOLT DEVELOPMENT PARTNERS

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Client	PVDP
Project	Botley West Solar Farm
Title	Ecology Designations

Final	Drawn By	PM/Checked By
FINAL	JM	MB
Project Number	**Scale @ A3**	**Date Created**
NP12426	1:25,000	MAY 2023
Figure Number		**Rev**
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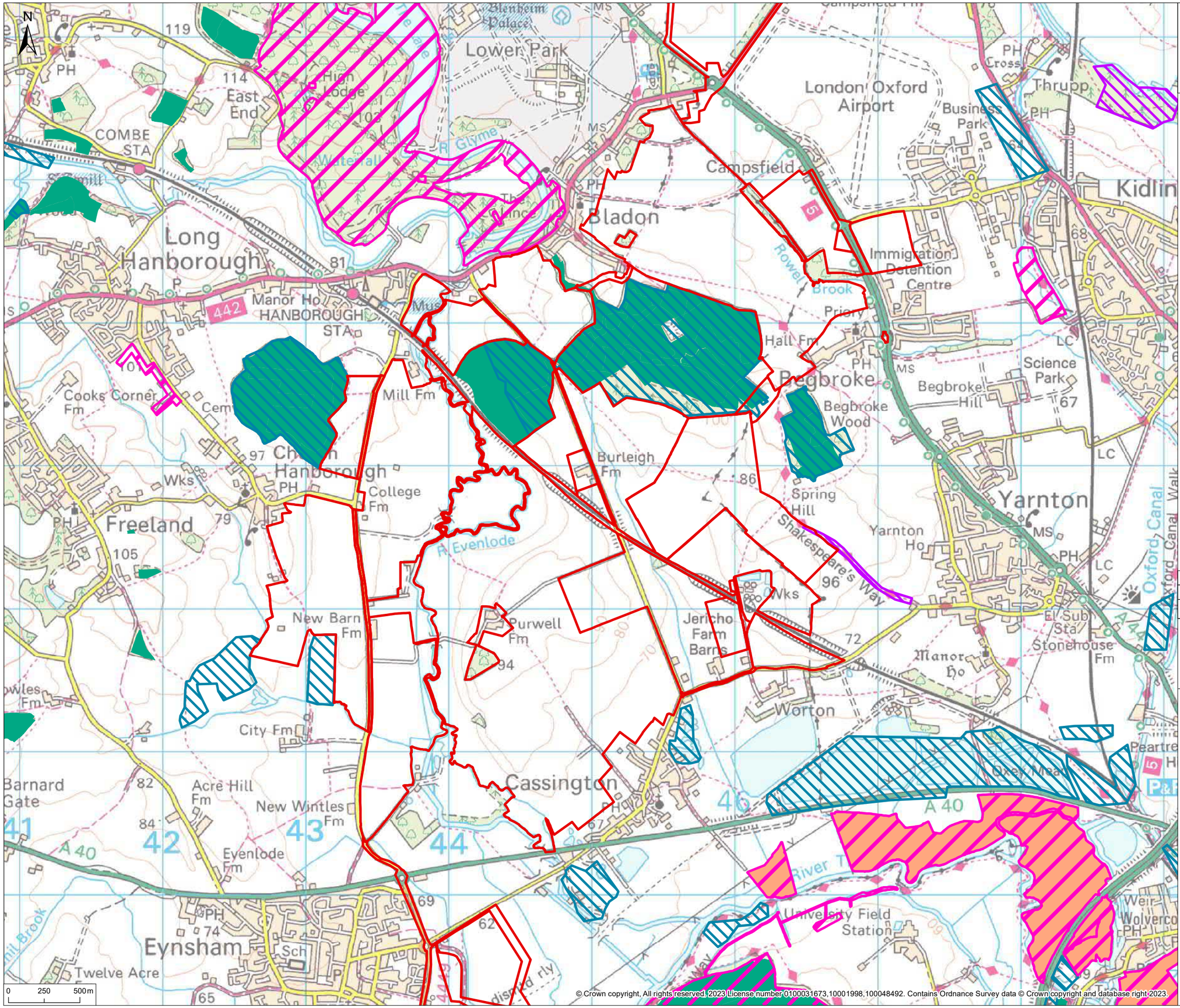

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Legend

- Order Limits
- Ancient Woodland
- Site of Special Scientific Interest
- Special Area of Conservation
- Cherwell District Wildlife Site
- Oxfordshire Local Wildlife Site

Rev	Description	By	CB	Date

PHOTOVOLT DEVELOPMENT PARTNERS

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Client	PVDP
Project	Botley West Solar Farm
Title	Ecology Designations

Final	Drawn By	PM/Checked By
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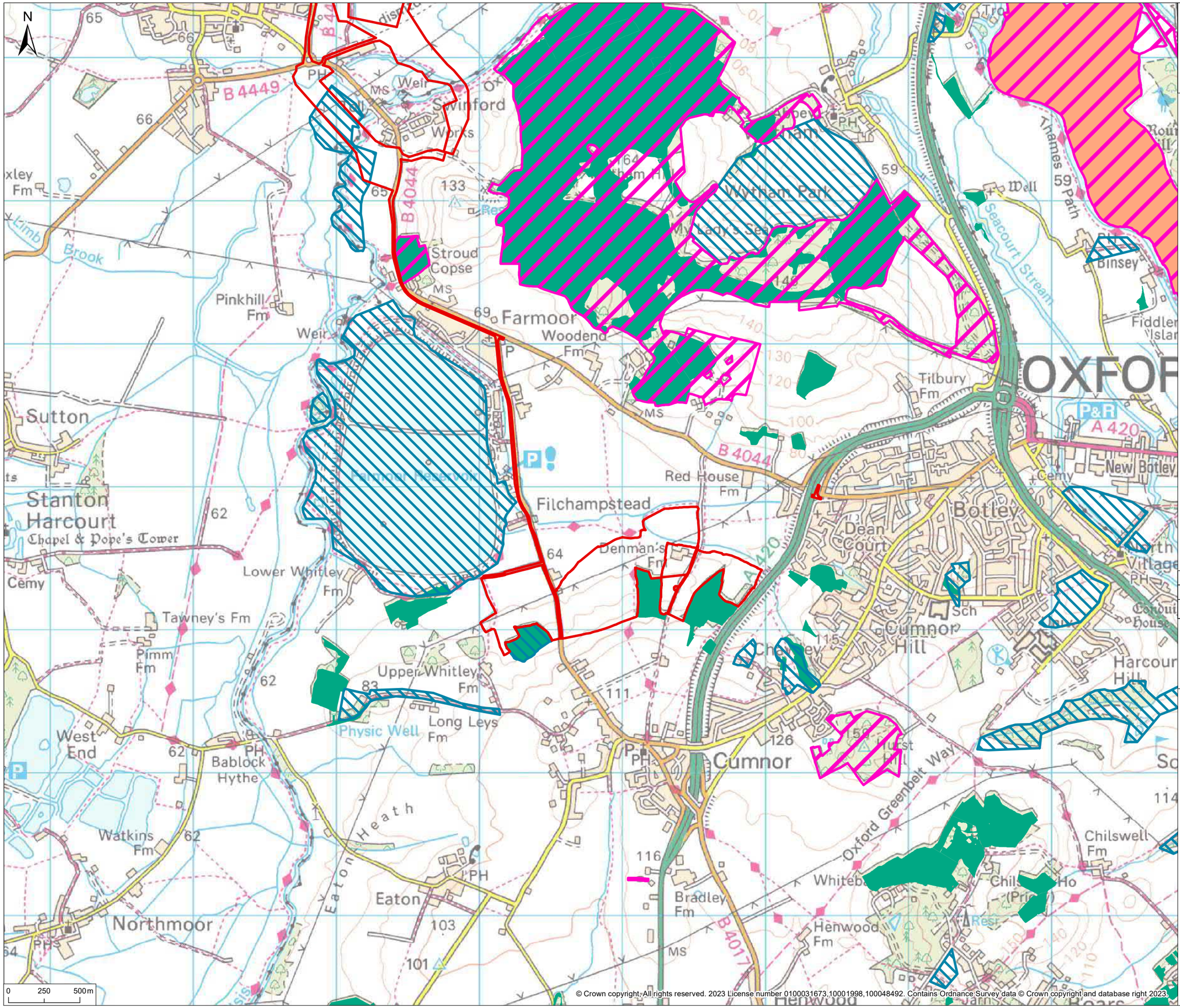

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- Order Limits
- Ancient Woodland
- Site of Special Scientific Interest
- Special Area of Conservation
- Oxfordshire Local Wildlife Site

Rev	Description	By	CB	Date

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Client	PVDP
Project	Botley West Solar Farm
Title	Ecology Designations

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Legend

- Order Limits
- Public Right of Way
- CRoW Access Land

Rev	Description	By	CB	Date

PHOTOVOLT DEVELOPMENT PARTNERS

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Client	PVDP
Project	Botley West Solar Farm
Title	Access Designations

Final	Drawn By	PM/Checked By
FINAL	JM	MB
Project Number	**Scale @ A3**	**Date Created**
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Legend

- Order Limits
- Public Right of Way
- CRoW Access Land

Rev	Description	By	CB	Date

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Client: PVDP

Project: Botley West Solar Farm

Title: Access Designations

Final	Drawn By	PM/Checked By
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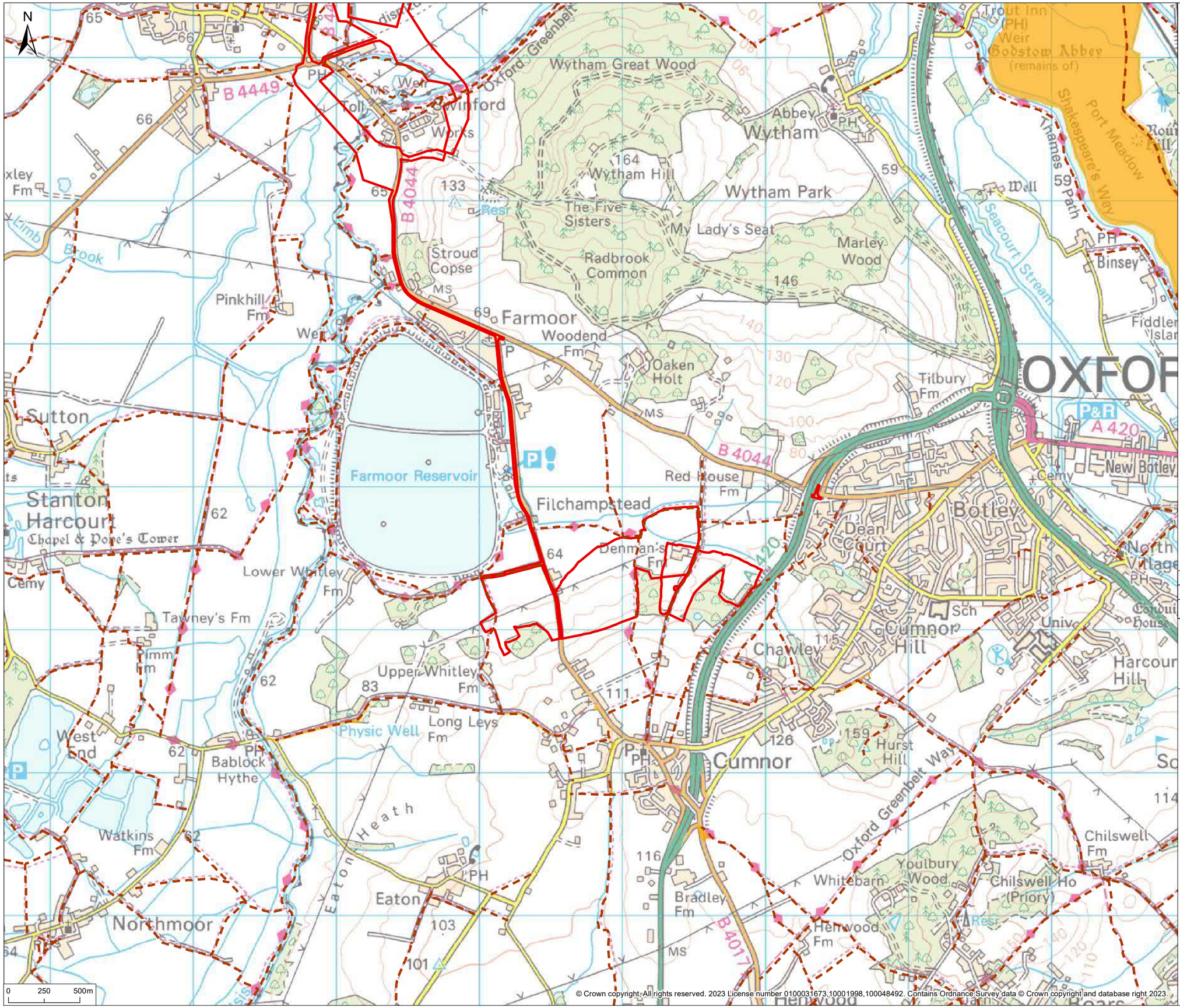

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Legend

- Order Limits
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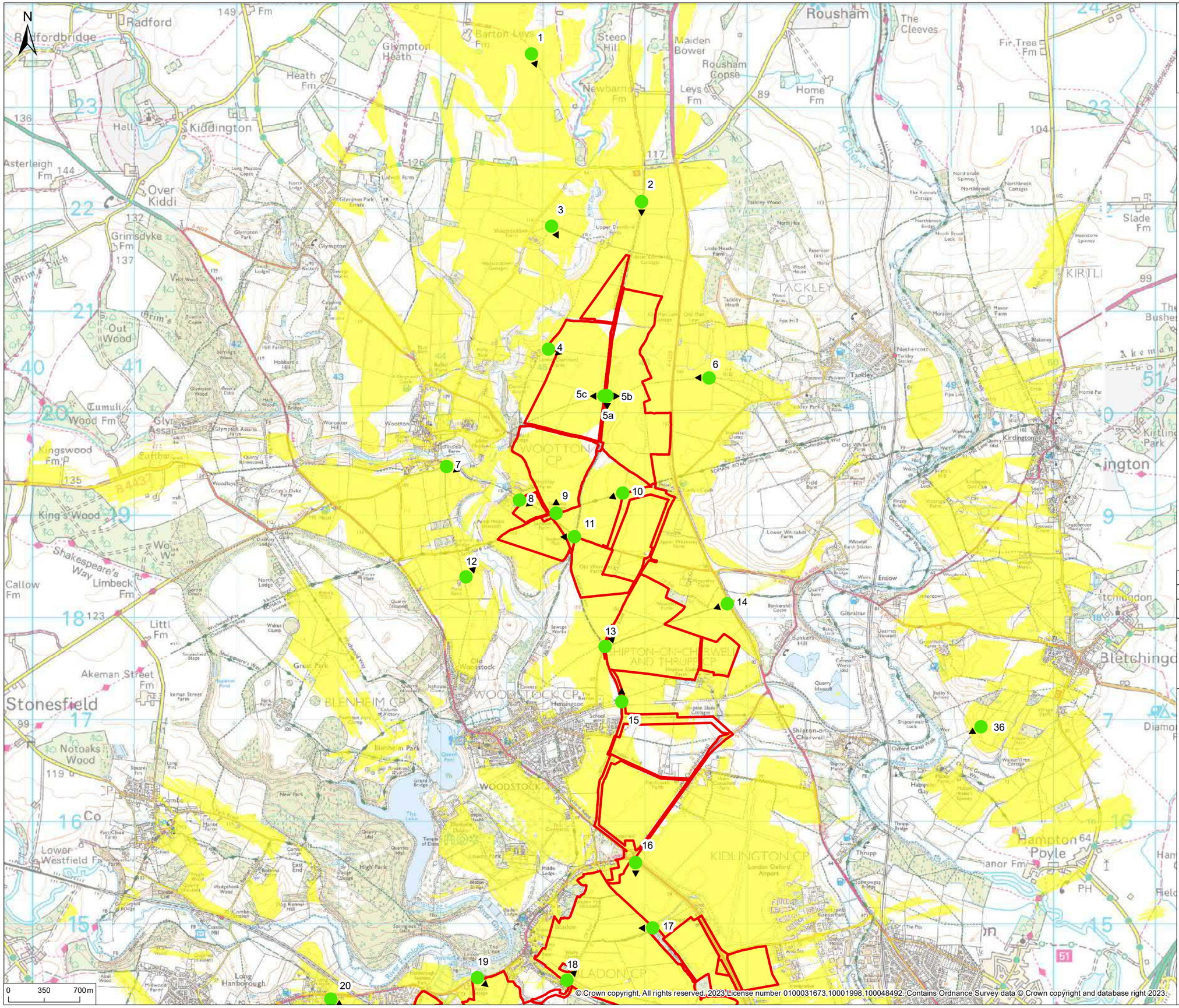

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Legend

- Order Limits
- Representative Viewpoints
- Zone of Theoretical Visibility

Rev	Description	By	CB	Date

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Client: PVDP

Project: Botley West Solar Farm

Title: Representative Viewpoints

Status	Drawn By	PM/Checked By
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Project Number	**Scale @ A3**	**Date Created**
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Figure Number: 7

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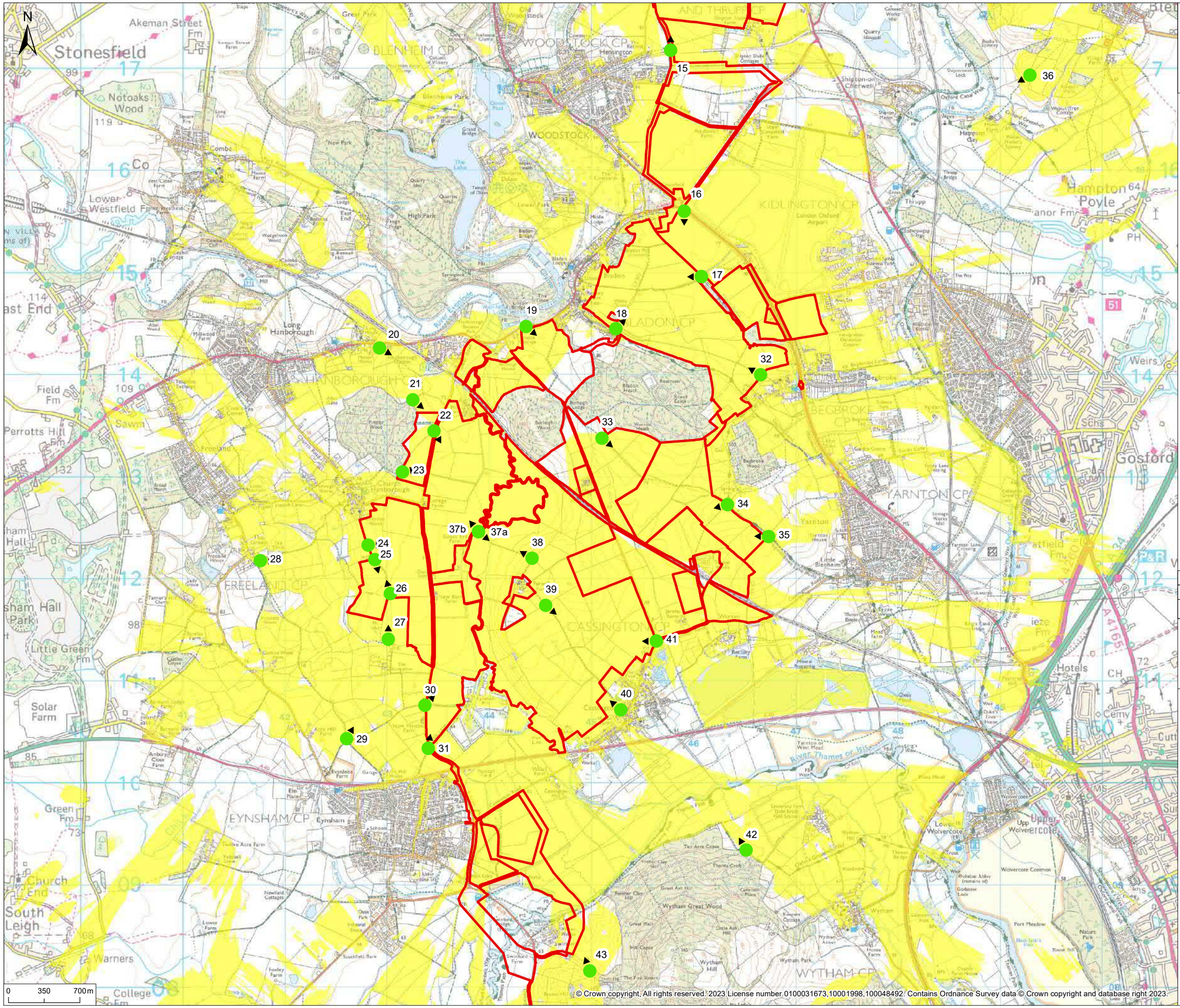

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Legend

- Order Limits
- Representative Viewpoints
- Zone of Theoretical Visibility

Rev	Description	By	CB	Date

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Client: PVDP

Project: Botley West Solar Farm

Title: Representative Viewpoints

Status	Drawn By	PM/Checked By
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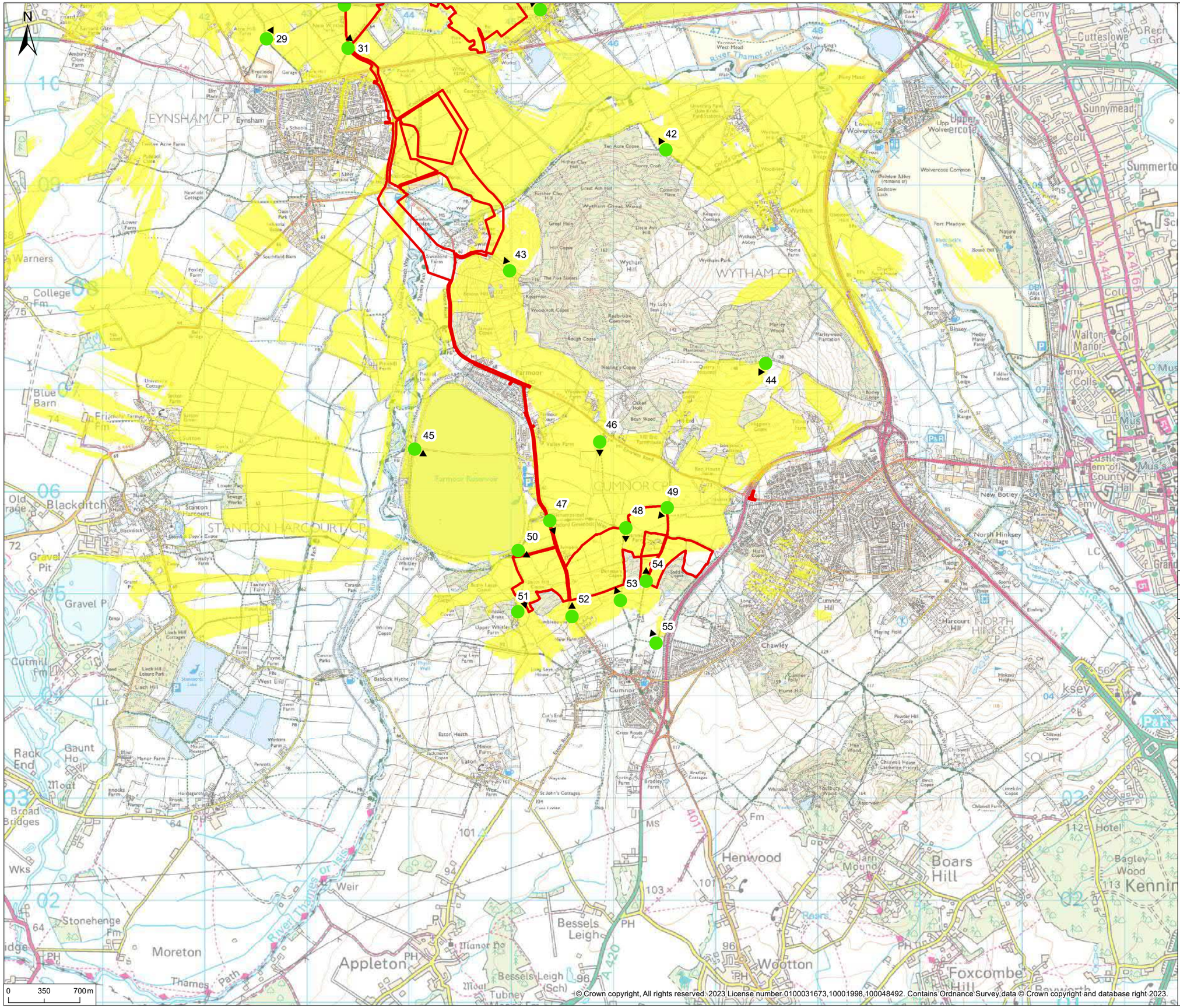

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Legend

- Order Limits
- Representative Viewpoints
- Zone of Theoretical Visibility

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Client: PVDP

Project: Botley West Solar Farm

Title: Representative Viewpoints

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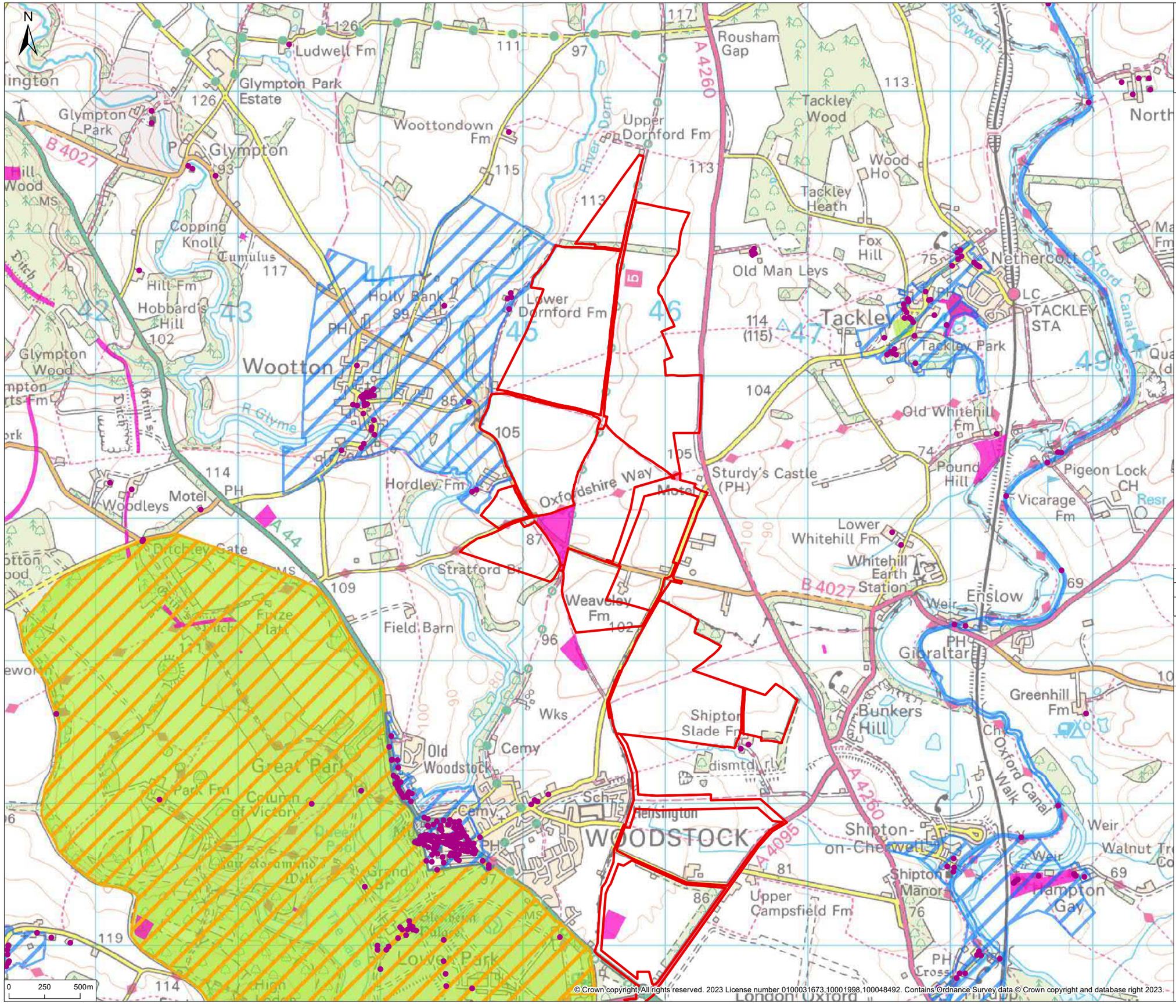

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Legend

- Order Limits
- Listed Building
- Conservation Area
- World Heritage Site
- Scheduled Monument
- Parks and Gardens

Rev	Description	By	CB	Date

PHOTOVOLT DEVELOPMENT PARTNERS

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Client: PVDP

Project: Botley West Solar Farm

Title: Heritage Designations

Final	Drawn By	PM/Checked By
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Project Number	**Scale @ A3**	**Date Created**
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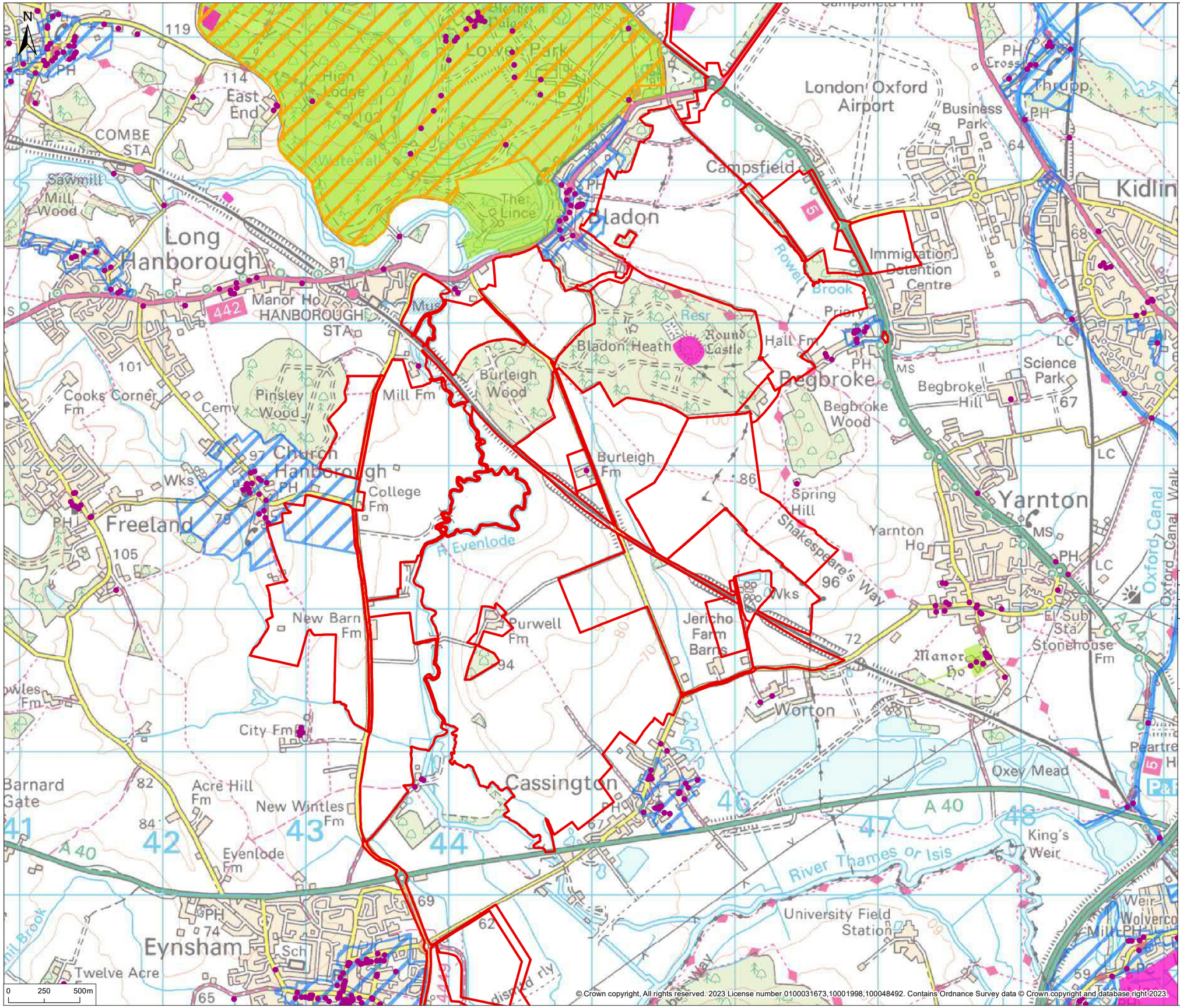

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Legend

- Order Limits
- Listed Building
- Conservation Area
- World Heritage Site
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- Parks and Gardens

Rev	Description	By	CB	Date

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Client: PVDP

Project: Botley West Solar Farm

Title: Heritage Designations

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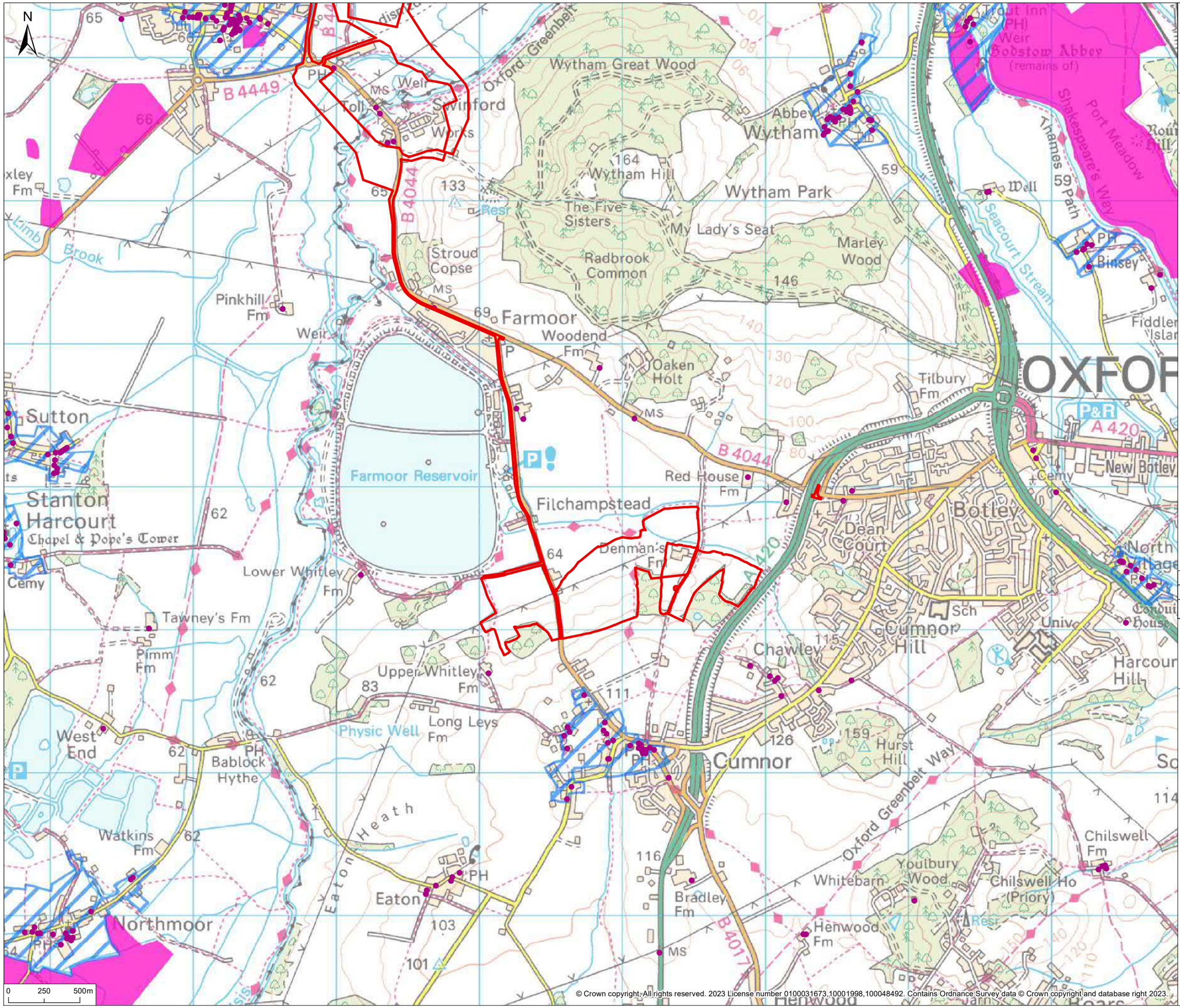

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Title: Heritage Designations

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