

Swindon Services

Environmental Statement: Volume 1

784-B048803

Document prepared on behalf of Moto Hospitality Ltd

September 2023

Tetra Tech Limited. Registered in England number: 01959704



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1.0 EXECUTIVE SUMMARY

This Environmental Statement (ES) reports the outcome of a formal Environmental Impact Assessment (EIA) of the Proposed Development of Swindon Services. It has been prepared on behalf of Moto Hospitality Ltd to accompany an outline planning application for a residential scheme submitted to Wiltshire Council (WC). The EIA has been undertaken by Tetra Tech Ltd, supported by a number of external consultants feeding into the EIA assessments.

The ES comprises the following separately bound parts:

- Non-technical summary – summarising the findings of the EIA in non-technical language.
- Volume 1: Written Statement – reporting the findings of the EIA.
- Volume 2: Appendices – technical material to support the main text presented in Volume 1.

Printed copies of the non-technical summary and ES (including figures and appendices) may be obtained from Tetra Tech Ltd. The non-technical summary is available free of charge, and a limited number of hard copies of the ES are available for £350 per copy. Alternatively, these documents are available as adobe acrobat files on CD at £25 per copy or can be downloaded from the WC website.

EIA Quality Mark

This Environmental Statement, and the Environmental Impact Assessment (EIA) carried out to identify the significant environmental effects of the proposed development, was undertaken in line with the EIA Quality Mark Commitments.

The EIA Quality Mark is a voluntary scheme, operated by the Institute of Environmental Management and Assessment (IEMA), through which EIA activity is independently reviewed, on an annual basis, to ensure it delivers excellence in the following areas:

EIA Management

EIA Team Capabilities

EIA Regulatory Compliance

EIA Context & Influence

EIA Content

EIA Presentation

Improving EIA practice

To find out more about the EIA Quality Mark please visit:

<https://www.iema.net/eia-quality-mark/>

2.0 VOLUME 1

The contents of Volume 1: Environmental Statement are listed below:

Chapter Number	Topic	Prepared by:
Chapter 1	Introduction	Tetra Tech
Chapter 2	EIA approach and Methodology	Tetra Tech
Chapter 3	Description of the Proposed Development	Tetra Tech
Chapter 4	Scheme Development and Alternatives Considered	Tetra Tech
Chapter 5	Traffic and Transport	Eddisons
Chapter 6	Noise and Vibration	Cass Allen
Chapter 7	Air Quality	Cass Allen
Chapter 8	Landscape and Visual Impact Assessment	IDP
Chapter 9	Hydrology, Flood Risk and Water	Pell Frischmann
Chapter 10	Ecology	Ecology by Design
Chapter 11	Cumulatives and In-combination Effects	Tetra Tech
Chapter 12	Conclusion	Tetra Tech

3.0 VOLUME 2 – APPENDICES AND FIGURES

Volume 2 contains the technical appendices and figures to support the assessments presented in Volume 1

3.1 APPENDICES

Appendix 1 – Introduction

- 1.1 Screening Opinion Request Report
- 1.2 Screening Opinion Decision Notice

Appendix 2 - EIA Approach and Methodology

None

Appendix 3 - Description of the Proposed Development

None

Appendix 4 - Scheme Development and Alternatives Considered

None

Appendix 5 – Traffic and Transport

None

Appendix 6 – Noise and Vibration

None

Appendix 7 – Air Quality

- 7.1 Operational Phase Significance Criteria
- 7.2 Wind Rose for Fairford (2022)
- 7.3 Recommended Construction Phase Mitigation
- 7.4 Traffic Data
- 7.5 Dispersion Model Details
- 7.6 Dispersion Model Receptors and Results

Appendix 8 – Landscape and Visual Impact Assessment

- 8.1 Baseline Figures and Viewpoint Photographs

Appendix 9 – Hydrology Flood Risk and Water

- 9.1 Flood Risk Assessment
- 9.2 Sustainable Drainage Report

Appendix 10 - Ecology

- 10.1 Planning Policy and Legislation
- 10.2 UKHabs Habitat Survey
- 10.3 Survey for Bats

10.4 Survey for Great Crested Newts

10.5 Survey for Wintering and Breeding Birds

Appendix 11- Cumulative and In-combination

None

Appendix 12 – Conclusions

None

Chapter 1: Introduction

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1.0 INTRODUCTION

- 1.1.1 The Environmental Statement (ES) and its associated Non-Technical Summary have been prepared by Tetra Tech on behalf of Moto Hospitality Ltd (hereafter termed the Applicant). This ES accompanies a suite of agreed documents that together form a single planning application being submitted to Wiltshire Council (WC) for the Proposed Development comprising a new Motorway Rest Area (MRA) located adjacent to the M4 Junction 16.

1.2 INTRODUCTION TO THE SITE

Site Location and Description

- 1.2.1 The Proposed Development Site is 7.27 ha in size, the extent of which is identified in the red line plan provided in Figure 1.1. The Site is located immediately adjacent to the east of Junction 16 (J16) of the M4 motorway, the B4005 (Hay Lane) runs along the western and southern boundaries and the M4 runs along the northern boundary. The site is also located approximately 1km to the southwest of the settlement of Freshbrook and 5km to the city centre of Swindon. The site is within the administrative boundary of Wiltshire Council (WC).
- 1.2.2 The UK grid reference for the Site is SU104827 (Northing 182709, Easting 410400) and the approximately postcode is SN5 8UD.
- 1.2.3 The Proposed Development is an irregularly shaped area consisting of predominantly greenfield land in agricultural use with internal boundaries comprised by scattered trees and broken hedges. Levels across the site undulate slightly with land dropping towards the southeast and rising towards the northwest of the site.
- 1.2.4 Land to the north of the site is urbanised and includes a variety of uses, the nearest of these including car dealerships, Holiday Inn Express (hotel) and warehouses. Beyond these developments to the north is the residential area of Freshbrook.
- 1.2.5 To the east of the site are agricultural fields with internal boundaries delimited by hedgerows and trees. Smaller portions of this land are Junction 16 of the M4 is located immediately to the northwest of the site. To the west of the site are further fields, parcels of woodland and a solar farm and to the south the land is predominantly open countryside with a Butterfly World and Farm Park approximately 450m to the southeast of the site.
- 1.2.6 A desktop review of potential environmental constraints has been undertaken using publicly accessible online sources as well as the findings of individual technical assessments, that in some cases have included site visits and surveys. A summary of the key receptors considered in this ES is presented in **Chapter 3: Description of Development**.

1.3 OVERVIEW OF THE PROPOSED DEVELOPMENT

- 1.3.1 The planning application description of development is as follows:
- 1.3.2 *“Outline application (with Access to be determined) for development of a new Motorway Rest Area (MRA) to provide up to 241 car parking spaces; up to 63 Heavy Goods Vehicle (HGV) parking spaces; coach and caravan parking; amenity building; fuel filling station; new access from B4005; and associated landscaping, infrastructure and ancillary works.”*
- 1.3.3 The proposal includes a potential link to a footway outside the southern boundary of the Site, adjoining the B4005, which will allow for enhanced pedestrian connectivity from the Site and nearby public transport links. These works are deemed as improvements to the highway and will be agreed through discussions with the Applicant, Council and Highways Department.
- 1.3.4 Further details of the Proposed Development can be found in **Chapter 3: Description of Development**.

1.4 THE APPLICANT

- 1.4.1 The Applicant, Moto Hospitality Ltd, is a privately owned motorway service area operator. The focus of Moto Hospitality Ltd is the UK’s largest motorway service area operator and is on the creation of exceptional new developments designed to best suit their locations.
- 1.4.2 More information on Moto Hospitality Ltd can be found on their website: <https://moto-way.com>

Figure 1.1. Site Location Plan and Red Line Boundary



1.5 LEGAL FRAMEWORK FOR THE ENVIRONMENTAL STATEMENT

- 1.5.1 Regulation 4(1) of the EIA Regulations¹ sets out EIA as a process consisting of:
- “the preparation of an Environmental Statement;*
 - any consultation, publication and notification required by, or by virtue of, these Regulations or any other enactment in respect of EIA development; and*
 - the steps required under Regulation 26.”*
- 1.5.2 Regulation 4(2) requires that the EIA must:
- “...identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors:*
- Population and human health;*
 - Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC(1) and Directive 2009/147/EC(2);*
 - Land, soil, water, air and climate;*
 - Material assets, cultural heritage and the landscape; and*
 - The interaction between the factors referred to in sub-paragraphs (a) to (d).”*
- 1.5.3 The development does not fall within any of the descriptions contained within Schedule 1 of the EIA Regulations for which EIA is mandatory. It was determined by the Applicant that the characteristics of the development were likely to fall under Schedule 2 Category 10 (p) *Infrastructure projects – Motorway service areas*. As the Proposed Development at that time comprised an area of 5.287ha, it exceeded the threshold of a maximum area of 0.5ha.
- 1.5.4 An EIA screening opinion was requested in accordance with Regulation 6 (1) of the EIA Regulations and the information above, obtaining a negative screening opinion i.e., EIA is not required for the following development description.
- “Outline Application with reserved matters for the development of a Motorway Rest Area (MRA) to provide 255 Car Parking Spaces, 62 Heavy Goods Vehicle (HGV) parking, additional vehicle parking, amenity Building, fuelling station and associated landscaping and works at Land at junction 16, M4 Motorway, Swindon.”*
- 1.5.5 The Screening Opinion Request Report together with the response received (reference PL/2023/04823 dated 15/08/2023) are provided in **Appendix 1.1. Screening Opinion Request Report** and **Appendix 1.2. Screening Opinion Decision Notice**, respectively. However, in order to produce a robust planning application and demonstrate the sustainable approach and environmental mitigation of the project, an ES has been produced.

Content of the Environmental Statement

- 1.5.6 In accordance with Regulation 18(3) of the EIA Regulations this ES contains the following information:
- “a description of the proposed development comprising information on the site, design, size and other relevant features of the development;*
 - a description of the likely significant effects of the proposed development on the environment;*
 - a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;*
 - a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;*
 - a non-technical summary of the information referred to in sub-paragraphs (a) to (d); and*
 - any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.”*
- 1.5.7 Pursuant to Regulation 4(2) of the EIA Regulations, the ES is organised on an EIA topic basis. Each ES chapter provides a brief overview of the legislative and planning policy context relevant to the EIA topic, and an overview of topic-specific baseline conditions is provided to inform the assessment. In accordance with the EIA scope, agreed through the EIA scoping process, impacts and likely significant effects of the Proposed Development on the environment are assessed. Where likely significant effects on the environment are identified, mitigation measures are considered and presented together with the residual effects.
- 1.5.8 Pursuant to Regulation 18(4) each ES topic chapter is ‘based on the most recent scoping opinion or direction issued’. However, due to timescales, a Scoping Opinion Request was not submitted and, therefore, a scoping exercise was undertaken and agreed with the client in order to provide each ES topic chapter scoped into the ES. Further information on the scoping exercise undertaken for the EIA is included in **Chapter 2: Environmental Impact Assessment Approach** of this ES.
- 1.5.9 The overall process that has been followed in undertaking this EIA is detailed below:
- Collating existing baseline data for the development Site and the surrounding area;
 - Identifying features of the existing environment likely to be affected by the Proposed Development;
 - Liaison with consultees;
 - Undertaking environmental surveys to supplement existing baseline data;
 - Identifying the environmental impacts of the Proposed Development;

¹ Her Majesty’s Stationery Office (HMSO). (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

- Substantiation of the environmental impacts and effects arising from the Proposed Development;
- Providing feedback into the design process;
- Identifying mitigation and enhancement measures; and,
- Reporting the process and assessment findings in an ES report to support the planning submission.

1.6 STRUCTURE OF THE ENVIRONMENTAL STATEMENT

- 1.6.1 In undertaking the EIA, current best practice has been referred to, and in particular the guidance set out in Department of the Environment, Transport and the Regions (DETR) Environmental Impact Assessment: A Guide to the Procedures (DETR, 2000)² and Institute of Environmental Management and Assessment (IEMA), Guidelines for Environmental Impact Assessment, IEMA Perspectives (IEMA, 2004)³.
- 1.6.2 In accordance with Regulation 18(3) of the EIA Regulations, this ES contains the following information:

a) “A description of the development;

b) An outline of the main alternatives studied and reasons for the choice of the development Site, taking into account environmental effects;

c) A description of the aspects of the environment likely to be significantly affected by the development;

d) A description of the likely significant effects of the development on the environment;

e) A description of the measures envisaged to prevent, reduce and where possible offset any significant effects on the environment;

f) A non-technical summary of the information provided above; and

g) An indication of any difficulties encountered by the applicant in making the assessment of environmental effects”.
- 1.6.3 This ES contains the findings and the information of the full EIA, together with the information and data collected during the assessment. The ES comprises the Non-Technical Summary and two volumes, as described below:

Non-Technical Summary
- 1.6.4 This is a summary of the ES in a non-technical language; it presents the existing site conditions, provides a description of the scheme, and details the predicted environmental effects of the proposals.

Volume 1: Environmental Statement Main Text and Figures

- 1.6.5 This comprises the introduction and policy context, followed by a discrete chapter for each environmental issue examined, and a summary, based on the findings of the technical reports.
- 1.6.6 The format of the ES a written statement (Volume 1) is as follows:

Chapter 1: Introduction

1.6.7 Presents the background to the development and provides an overview of the assessment process.

Chapter 2: Environmental Impact Assessment Approach

1.6.8 Describes the approach followed in undertaking the EIA, including an outline of the approach followed in undertaking the assessments and details of the consultation process.

Chapter 3: Description of Proposed Development

1.6.9 Outlines the main characteristics of the Proposed Development that have been assessed as part of the EIA, covering both the construction and operational phases of the development.

Chapter 4: Scheme Development and Alternatives Considered

1.6.10 Outline of the main alternatives studied and reasons for the choice of the development Site, taking into account environmental effects.

Chapters 5-10: Impact Assessment and Mitigation

1.6.11 Describes the baseline conditions for various environmental topics and provides an assessment of significant environmental effects taking into account mitigation measures to be implemented. The following topics have been assessed:
 - Traffic and Transport;
 - Noise and Vibration;
 - Air Quality;
 - Landscape and Visual;
 - Hydrology, Flood Risk and Water; and
 - Ecology.

1.6.12 Each environmental topic listed above is reported in a similar format (outlined below) for ease of comparison, this is explained in the relevant chapters where appropriate.
 - Introduction;
 - Methodology and Scope;
 - Baseline Environment;
 - Mitigation Within the Submitted Design;

² Department of the Environment Transport and the Regions (DETR). (2000). Environmental Impact Assessment: A Guide to the Procedures (DETR).

³ Institute of Environmental Management and Assessment (IEMA). (2004). Guidelines for Environmental Impact Assessment, IEMA Perspectives.

- Likely Significant Environmental Effects of the Scheme;
- Additional Mitigation, Compensation and Enhancement Measures;
- Assessment Summary and Likely Significant Residual Environmental Effects;
- Cumulative Impacts; and
- References.

Chapter 11: Cumulative and Interactive Effects

1.6.13 Outlines the cumulative developments that have been assessed.

1.6.14 The cumulative assessment also considers the impacts caused by the actions of different projects together with the project being assessed (additive and synergistic impacts) and the impacts between different environmental aspects of a single project (in-combination).

Chapter 12: Conclusion

1.6.15 Outline of the main conclusions drawn by the assessment including identification of any residual effects and a consideration of the potential for secondary, cumulative and synergistic effects. The chapter will also set out all mitigation commitments, including the roles and responsibilities for their delivery and implementation and means by which their effectiveness can be monitored.

Volume 2: Appendices

1.6.16 This comprises the specialists' technical reports (as appropriate) and provides supportive background and technical information for the chapters in Volume 1.

1.7 PROJECT TEAM AND ES AVAILABILITY

1.7.1 Regulation 18(5) places requirements on the developer to ensure that those preparing the ES are 'competent experts.' In addition, there is a requirement placed upon the developer that the ES must be accompanied by a statement outlining the relevant expertise or qualifications of such experts.

1.7.2 No definition of competent expertise is provided in the EIA regulations. Nevertheless, the Institute of Environmental Management and Assessment (IEMA) has set out advice in a position statement that an individual who can demonstrate all of following may be considered a specialist competent expert in EIA:

- Full membership relevant professional body.
- Experience of leading substantive components of topic assessment in EIA.
- Evidence of on-going CPD relevant to topic/content Schedule 4.

1.7.3 The EIA project team has been led by consultants Tetra Tech. Tetra Tech is a registrant to the EIA Quality Mark scheme run by IEMA and are regarded as 'competent experts' as specified by the EIA Regulations. The ES complied was undertaken with input from specialists within Tetra Tech and other external consultants. The input into the ES from the project team is set out in Table 1.1.

Table 1.1. EIA Project Team

Role / Topic	Author	Qualifications	Verifier	Qualifications
EIA Management and Co-ordination	Paola Arias, EIA Consultant, Tetra Tech	BSc, Msc, GradIEMA, EIA Practitioner	Howard Waples, Director, Tetra Tech	BSc, Msc, MIEMA, CEnv
Traffic and Transport	Mark Cleary, Associate Director, Eddisons	HNC	Phil Wooliscroft, Partner, Eddisons	Msc MCIT
Noise and Vibration	Samuel Bryant, Director, Cass Allen Associates Ltd.	MPhys (Hons), CEng, MIOA	Neil Morgan, Associate Director, Cass Allen Associates Ltd	BSc MIOA
Air Quality	Hazel Swinfen, Air Quality Consultant, Cass Allen Associates Ltd.	BSc (Hons), AMIEnvSc	Paul Hayward, Technical Director, Cass Allen Associates Ltd.	MSc, BSc (Hons), MIEnvSc, MIAQM
Landscape and Visual Impact	Philip Smith, Associate Landscape Architect, IDPL	BSc, MLA, CMLI	Kevin Charsley, Director, IDPL	BA, PG Dip LA, CMLI, IEMA
Hydrology, Flood Risk and Water	Thomas Sturtridge, Graduate Engineer, Pell Frischmann	BSc (Hons), MSc, PIEMA	Daniel Allum-Rooney, Technical Director, Pell Frischmann	BSc (Hons), MSc, GradCIWEM
Ecology	Olyvia Hall, Ecologist	BSc(Hons) MSc QCIEEM	Laura Grant, Associate Ecologist	BSc(Hons) MCIEEM
Conclusion	Paola Arias, EIA Consultant, Tetra Tech	BSc, Msc, GradIEMA, EIA Practitioner	Howard Waples, Director, Tetra Tech	BSc, Msc, MIEMA, CEnv

1.7.4 The Non-technical Summary is available for £75, and a limited number of hard copies of the Environmental Statement are available for £500* per copy (plus VAT and p&p). Alternatively, these documents are available as adobe acrobat files on CD from the same address at £75 (plus VAT and p&p) per copy.

1.7.5 Copies of the ES may also be viewed on WBC's online services:
<https://development.wiltshire.gov.uk/pr/s/>

Chapter 2: EIA Approach and Methodology

Environmental Statement: Volume 1

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2.0 ENVIRONMENTAL IMPACT ASSESSMENT APPROACH

2.1 EIA PROCESS AND OBJECTIVES

- 2.1.1 This chapter of the Environmental Statement (ES) sets out the overall approach and methodology for assessing the environmental effects of the Proposed Development. It describes the process of identifying the environmental topics to be included in the ES and the method of assessing the effects that are likely to arise from the Proposed Development and the significance of these effects.
- 2.1.2 The Environmental Impact Assessment (EIA) is undertaken in accordance with the EIA Regulations 2017¹. The EIA methodology is in accordance with applicable legislation, and best practice guidance and has been tailored to each technical aspect scoped into the EIA using industry standard methods and assessment criteria, as detailed in the respective technical chapters, specifically, Chapters 5 to 10.
- 2.1.3 Details of the Proposed Development, including its construction and operation, are presented in **Chapter 3: Description of Development**.

2.2 SCOPE OF THE WORK

Geographic Scope

- 2.2.1 The EIA directly covers the physical extent of the Site as shown in the red line boundary plan, **Figure 1.1 of Chapter 1: Introduction**. It is defined by the area of land to be used, the nature of the current environmental conditions and the manner in which impacts are likely to be generated. It is important to note however that the influence of many predicted impacts can extend beyond the immediate Site boundary, for example, the effects on some species that are primarily located off-site may use the site for foraging. Where identified and relevant, these impacts have also been assessed as part of the EIA.
- 2.2.2 The geographical extent of the EIA also considers the potential implications of related and un-related development activities. The potential cumulative effects of the development in association with other developments both during construction and on completion are included where relevant as required by Schedule 4, Part 1, Paragraph 5e of the EIA Regulations (HMSO, 2017). **Chapter 11: Cumulative and Synergistic Effects**, identifies the cumulative developments to be considered within the cumulative assessment.

Temporal Scope

- 2.2.3 Under the current programme, it is expected that construction will take place between 2025 and 2026.
- 2.2.4 The assessments presented herein are largely based on the comparison of expected impacts compared with current or recent baseline environmental conditions. This is with the exception of topics such as transport which factor in future baseline changes into the assessments in future year

impact scenarios. These approaches are explained in further detail in the relevant chapters concerned.

Technical Scope

- 2.2.5 This ES was created in order to produce a robust planning application and demonstrate the sustainable approach and environmental mitigation of the project despite a negative screening opinion obtained from Wiltshire Council (WC) on August 2023 (see **Appendix 1.2. Screening Opinion Decision Notice**).
- 2.2.6 Even though a scoping opinion was not sought from the WC, a scoping exercise was undertaken amongst the specialists and, in order to ascertain the likely scope of the EIA, the scoping process involved the following steps:
- Identification of the planning application boundary;
 - Identification of the key characteristics of the development site and the establishment of the environmental baseline through a series of desk and field studies;
 - Identification of gaps in the baseline and the further survey work required to address these shortfalls;
 - Initial consideration of the potential sources and nature of environmental impacts through assessment against the environmental baseline; and
 - Definition of impact assessment methodologies to be utilised.
- 2.2.7 In addition, the following key documents are available as separate reports prepared as part of the wider planning application documentation:
- Planning Statement;
 - Design and Access Statement;
 - Transport Assessment;
 - Statement of Community Involvement;
 - Plans and Drawings;
 - Arboricultural Impact Assessment & Arboricultural Impact Statement;
 - Biodiversity Impact Assessment;
 - Heritage Statement with Archaeological Surveys;
 - Lighting Assessment;
 - Sustainable Construction and Energy Statement;
 - Agricultural Land Quality; and
 - Mineral Safeguarding Assessment.

¹Her Majesty's Stationery Office (HMSO). (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

Topics scoped into the ES

2.2.8 Given that a formal scoping opinion was not sought from the WC, the topics were formally agreed with the client through a scoping exercise, including a desk-based study and professional judgement i.e., those which have the potential to give rise to significant environmental effects and to be further assessed are addressed as part of this ES within the relevant technical chapters. These include:

- Chapter 5: Traffic and Transport;
- Chapter 6: Noise and Vibration;
- Chapter 7: Air Quality;
- Chapter 8: Landscape and Visual;
- Chapter 9: Hydrology, Flood Risk and Water; and
- Chapter 10: Ecology.

2.2.9 The specific focus of the above assessments is detailed within each chapter. Each topic not considered further in the ES is specified and justified in the subsequent section.

Topics not considered further in the ES

2.2.10 Issues which have been assessed as unlikely to give rise to significant environmental effects have been omitted (also termed as ‘scoped out’) from the EIA and are detailed below with reasons provided as to why they are not considered to give rise to significant environmental effects.

Socioeconomics

2.2.11 As the Proposed Development consists of agricultural land it has limited contribution to local economy other than through employment for agricultural workers.

2.2.12 The Proposed Development is also anticipated to contribute to local economy during construction and operational stages via employment opportunities and contributions towards local labour market. Additionally, as there are no residential elements to the scheme there will be no increase in population associated with the development which could result in additional pressures on the capacity of schools or local healthcare facilities.

2.2.13 On this basis it is anticipated that no significant adverse effects were identified as a result of the development, a separate chapter assessing socio-economic effects is not required with this ES.

Minerals, Soil and Agricultural Land

2.2.14 According to the Natural England Agricultural Land Classification (ALC) Grades² map, the majority of the Site appear to largely comprise a grade 3b agricultural land (moderate quality). An Agricultural Land Quality Assessment has therefore been undertaken and submitted with the application, with all suitable topsoil being reused on site. It is considered that the loss of the grade 3 agricultural land would not be significant due to its moderate limitations.

2.2.15 The British Geological Survey (BGS) map³ indicates that the Site is underlain by a bedrock geology of Kimmeridge Clay Formation - Mudstone. Sedimentary bedrock formed between 157.3 and 152.1 million years ago during the Jurassic period, which suggests limited potential for infiltration.

Furthermore, aquifer designations for the underlying strata identify the superficial drift and bedrock classifications both to be ‘unproductive’ strata.

Construction

2.2.16 Based on results from the Site investigation, no remedial action in respect to human health is considered necessary for the Proposed Development.

2.2.17 During the construction works measures within a Construction Environmental Management Plan (CEMP) will be implemented to control pollution related risks. This will be secured via a planning condition. This document will also set out measures for the storage and handling of potentially contaminating materials and also emergency procedures which should be adopted in the event that unidentified contamination is found during groundworks.

Operation

2.2.18 Any potential effects associated with ground contamination are anticipated to be resolved prior to and during the construction works. No significant effects associated with the operational phase of the development are therefore anticipated.

2.2.19 The above review demonstrates that suitable mitigation measures can be provided on site to reduce any potential effects associated with Ground Conditions and Land Contamination to a level which is not significant in EIA terms therefore these topics do not need to be assessed further within the ES.

Archaeology and Cultural Heritage

2.2.20 A Heritage and Archaeological Assessment has been produced Smith Jenkins and is submitted in support of the planning application. Any necessary further evaluation of the development site will need to be agreed with WC Service post submission, if required.

Heritage

2.2.21 Initial desk study of the site confirms that there are no statutorily designated archaeological heritage assets (e.g. Scheduled Monuments, Listed Buildings, World Heritage Sites) within the site boundaries. The closest Scheduled Monument is Medieval rural settlement 240m south of Lower Woodshaw Farm and approximately 2km to the south west of the Site (Historic England Ref: 1018388). There are three designated built heritage assets within the relevant search radius, none of which have clear visibility onto the site due to dense vegetation. These are:

- Upper Studley Farmhouse: Grade II listed building, NHLE 1022662, located approximately 300m south of the study site;
- Studley Grange Farmhouse: Grade II listed building, NHLE 1022664, located approximately 670m south of the study site; and
- Milestone Near Spittleborough Farm, at NGR SU 095828: Grade II listed building, NHLE 1022661, 810 m west of the study site.

2.2.22 In all cases, the study site does not form part of the setting of these heritage assets and makes no contribution to their significance. The proposals, which will retain the woodland character of its immediate surroundings, will not change the character of these heritage assets’ settings. The

² Natural England. (2023). Agricultural Land Classification (ALC) Grades – Post 1988 (England).

³ British Geological Survey (BGS). (2023). BGS Geology Viewer.

	development will have no impact on their settings or the current ability to experience or appreciate their respective significance. The proposals will therefore have no impact on their significance under the Regulations and therefore is not considered further within this ES.		<u>Operation</u>
	<u>Archaeology</u>		
2.2.23	Recent geophysical survey across the site has identified no anomalies suggestive of extensive archaeological activity. Those anomalies identified have uncertain functions and origins and are described as follows: “Linear anomaly that appears to relate to a fragmented linear ditch”; “A small number of discrete, pit-like features”; - A small number of very weakly positive linear anomalies and negative linear anomaly in the north-western part of the site”; and “Ridge and furrow in the north-eastern part of the site, as well as more recent agricultural activity in the west.”	2.2.32	The development will be designed to incorporate waste storage and recycling facilities in accordance with Regulations and policy. WC will, under their statutory duties, collect the generated waste from the site. The Proposed Development would provide sufficient internal and external space for the waste containers required under WC’s existing waste collection scheme.
		2.2.33	The detailed design of the scheme would allow for appropriate means of access for refuse collection vehicles to access all properties within the Proposed Development. The site design would also ensure safe access and manoeuvrability for collection crews, including provision of flat or gently sloping gradients, dropped kerbs and appropriate distances between waste storage areas and collection points.
2.2.24	According to the Magnetometer Survey Report commissioned by Smith Jenkins in June 2023, there are no designated or non-designated archaeological heritage assets recorded in the site. The site is also located 500m to the northwest of an undated field system that is likely of medieval date.	2.2.34	With implementation of an appropriate SWMP and inclusion of design features to facilitate waste collection, it is considered that there is limited potential for significant waste effects to arise as a result of the development and therefore it will not exceed the production established than the motorway services areas along M4. As such it is scoped out of further assessment within the ES.
2.2.25	As such, archaeology is not considered further within this ES.		Human Health
	Lighting	2.2.35	The Site is currently of agricultural use, therefore, currently has a benefit to human health through the production of food and other ecosystem services it provides. However, it is not publicly accessible and provides little recreational benefits.
2.2.26	The planning application is supported by a Lighting Statement which assesses the potential effects of the new street lighting and domestic scale lighting which would be agreed at the detailed phase of the scheme.		<u>Construction</u>
2.2.27	The baseline environment within the site boundaries includes currently undeveloped areas to the south, east and west. To the north the site is bounded by a commercial area, to the west there is the Junction 16 and to the south the site is bounded by the B4005 (Hay Lane). All of them are street lit.	2.2.36	The Proposed Development will abide by current safety regulations and construction activities will be controlled through a CEMP, ensuring compliance with the Health and Safety Construction (Design and Management) Regulations (2015). These would reduce any potential effects on construction workers and potential users of the site during the construction works on site.
2.2.28	Lighting receptors surrounding the scheme include commercial properties to the north and ecological receptors including the trees and woodland within the Site and to the east, south and west of the Site.		<u>Operation</u>
2.2.29	Details of the embedded mitigation and careful design is provided in the Lighting Statement. As a result of this it was determined that lighting is unlikely to have a significant environmental effect and that it could be appropriately addressed through a standalone technical report.	2.2.37	The potential operational effects on human health are considered within the assessments of air quality (Chapter 7: Air Quality and supporting appendices) and noise (Chapter 6: Noise and Vibration and supporting appendices) assessments supporting the ES. Overall, no significant effects during the operational phase are anticipated.
	Waste	2.2.38	It is, however, designed to provide some wider health benefits, such as improvements to the biodiversity, landscaping, electric vehicle charging points, a selection of food, amenity space and rest space to reduce driver fatigue and the risk of sleep related road vehicle collisions.
2.2.30	The Proposed Development site is currently predominantly a greenfield site and therefore, does not generate significant levels of waste.	2.2.39	Based on the above review, it is considered that no significant adverse effects on human health are likely, and this topic is therefore not assessed further as part of this ES.
	<u>Construction</u>		Major Accidents, Fire and Natural Disasters
2.2.31	The construction process for the Proposed Development would generate levels of waste through groundworks, construction and fit out. A Site Waste Management Plan (SWMP) would be prepared pre-commencement and the implementation of the SWMP would ensure good Site management practice resulting in the minimization of waste and promoting its reuse or recycling where possible.	2.2.40	Most of the Site is currently of agricultural use, therefore, it is considered to be at negligible risk of Major Accidents, Fire and Natural Disasters.

Construction

2.2.41 During the construction phase, the potential effects are likely to include either large volume storage or frequent passage / delivery of fuels and chemicals or potential for traffic accidents. Given the scale of the development and with the implementation of good construction practices and a CEMP, any potential risks are considered to be low.

Operation

2.2.42 Whilst the Proposed Development will introduce new sources for potential major accidents through the provision of onsite fuel storage, these will be designed to the relevant standards and a storage certificate will be required to demonstrate that the site adheres to legislation and health and safety when it comes to the storage of fuel. The electrical substations will be constructed to the appropriate specifications. As such the chance of a major accident is considered to be minimal and no additional mitigation other than those mentioned will be required.

2.2.43 The Proposed Development will be designed to current best practice, in respect of road safety, drainage design and building regulations. Site-specific considerations in relation to safety, security and crime prevention are set out within the Design and Access Statement.

2.2.44 In respect of natural disasters, the Site is identified to be located in Flood Zone 1. The supporting Flood risk and Drainage Strategy includes for the provision of SuDS taking into account an allowance for climate change. Potential effects associated with natural disasters are therefore also considered to be low.

2.2.45 With the implementation of appropriate mitigation and management measures, no significant effects associated with Major Accidents, Fire and Natural Disasters are envisaged. As such this topic is scoped out of further assessment within the ES.

Climate Change

2.2.46 The requirement to address climate change has been introduced by the EIA Regulations 2017 with a specific requirement for the following:

- The impact of the Proposed Development on climate through, for example, the nature and magnitude of greenhouse gases (GHG) emissions, defined as climate change mitigation; and
- The vulnerability of the Proposed Development to climate change, defined as climate change adaptation.

Climate change mitigation

2.2.47 Increases to GHGs are a potential impact for both the construction and operational phases. This is due to emissions from construction plant on site, and construction phase road traffic, as well as emissions from operational users and road vehicle exhaust emissions associated with travel to and from the site.

2.2.48 To reduce construction emissions including embodied carbon, where possible, the detailed design of the Scheme would incorporate environmentally sustainable techniques, eco-friendly and local materials (e.g., low carbon concrete), to reduce the carbon footprint. Further measures which would be implemented by the construction contractor at the stages at which the materials are being

procured would include monitoring developments in construction materials and adopting new technologies where practical. This will be detailed in the CEMP.

2.2.49 The Proposed Development shall be designed and constructed to be a highly sustainable, low energy and carbon generating development in line with both national regulations and local planning policies and the clients' aspirations to reduce energy use and carbon emissions by, for example, providing infrastructure to support electric vehicle (EV) and promoting sustainable transport. These details are set out in the Sustainability and Energy Statement produced in support of the planning application.

2.2.50 These measures will result in the development being able to reduce both its ongoing energy demands and its resulting carbon emissions in accordance with the national carbon reduction requirements and therefore no further assessment of GHG emissions is considered necessary as part of the ES.

Climate change adaptation

2.2.51 Climate change adaptation refers to the resilience of the Proposed Development to climatic changes, which include but are not limited to increases in temperatures and flood events.

2.2.52 The UKCP18 Projections at 2°C global mean warming show a general trend of:

- Increased summer temperatures – the UK's summers will also be drier with average temperatures anomalies ranging from 0.7° to 4.2°;
- Increased winter temperatures – the UK's winters will also be milder with higher rates of rainfall; and,
- Precipitation – slightly wetter winters and drier summers.

2.2.53 The Flood Map for Planning published by the Environment Agency and available online confirms the site is in Flood Zone 1 (Low Probability) and is at low risk of flooding from rivers and the sea. A Flood Risk Assessment has been prepared to support the application that has appraised the potential risk through a review of the anticipated depth and frequency of the flooding the mapping suggests. A suitable discharge rate has also been included within the supporting drainage strategy which allows for the impacts of climate change.

2.2.54 Limited risk on the development associated with other climatic changes are anticipated.

2.2.55 The above review demonstrates that suitable mitigation measures can be provided on site to reduce any potential effects associated with climate change to a level which is not significant in EIA terms therefore this topic does not need to be assessed further within the ES.

2.3 CUMULATIVE ASSESSMENT SCOPE

2.3.1 As required by Schedule 4, Part 1, Paragraph 4 of the EIA Regulations, the likely effects of the Development and the likely effects of other developments in the geographical area of the Site have been considered in order to determine the likelihood of cumulative effects.

2.3.2 The EIA Regulations require consideration of developments that have been undertaken recently or are currently under construction, those for which planning permission exists or those which could be reasonably considered to be coming forward.

- 2.3.3 A search was carried out by the Smith Jenkins and Tetra Tech as part of the planning application to identify newly committed or proposed developments within the vicinity of the Proposed Development. This involved a consideration of relevant planning policy and an online search of the Council’s planning application database, from this search, a provisional list of developments was drawn up and shown in Table 2.1, along with an assessment provided in **Chapter 11: Cumulative and Synergistic Effects**.

Table 2.1. Scoped-in Cumulative Sites

ID	Development Name	Site	Policy No/ Application ref	Development Proposed	Status	Consider as part of the ES
1	Studley Grange Garden and Leisure Park	Studley Grange Garden and Leisure Park, Hay Lane, Wroughton, Swindon, Wiltshire, SN4 9QT	19/02146/FUL	Demolition of 328m canopy, infill extensions of a) 39m and b) 553m, erection of building for relocated indoor play centre 598m, siting of Portakabin sales office (35m), change of use of open sales area to outdoor play area, change of use of car park to ancillary landscape materials yard, change of use of retail area to car park and formation of coach parking area, all for use as garden centre, craft centre and family leisure attraction.	Partially developed	Yes
2	Wichelstowe Development	Area Southern Town Development Swindon Swindon	S/13/1524	Southern Town Expansion including up to 4500 dwellings, employment, commercial, shopping, schools, open space, park and ride, roads, sewers and associated works (Variation of extent of infrastructure, phasing and affordable housing, upon S/TIME/13/1521 by the Local Planning Authority, conditions 1, 62, 66 & 67, 73, 76 - 79, 82, 85, 88 - 90, 93 and 95 - 97).	Decision: Granted Permission Fri 28 Feb 2014	Yes
3	Royal Wootton Bassett	Land to the South of A3102 and East of Royal Wootton Bassett, Wiltshire	PL/2023/02129	Outline planning application with all matters reserved except access for up to 410 dwellings, land for a primary school and pitches, public open space, landscaping and associated infrastructure.	Awaiting decision	Yes
4	Land To The Rear Of Woodland View	Land To The Rear Of Woodland View, Swindon Road Wroughton, Swindon, SN4 9BD	S/OUT/20/0556	Erection of 104no. dwellings, traffic roundabout, roads and associated works - Means of Access, Layout and Scale not reserved - (without compliance with condition 29 of permission S/15/1750 regarding substitute drawings).	Decision: Granted Permission Wed 10 Feb 2021	Yes

2.4 ASSESSMENT CRITERIA

Overview

- 2.4.1 The assessments presented in this ES have considered the potential for significant environmental impacts to affect the baseline conditions as a direct/indirect result of the Proposed Development. The baseline conditions are defined as the existing state of the environment and how it may develop in the future in the absence of the proposals. This is a requirement of the EIA Regulations (2017) which in Schedule 4, Paragraph 3 require a description of the aspects of the environment likely to be significantly affected by the development.
- 2.4.2 Predictions are necessary when forecasting future impacts and, in order to ensure that predictions are as accurate as possible. The EIA Regulations which in Schedule 4, Paragraph 6 require a description of the applicant or appellant of the forecasting methods used to assess the effects on the environment. Assessments have been undertaken in accordance with best practice guidelines published by the relevant professional bodies.
- 2.4.3 Where there is no topic specific guidance available, a common framework of assessment criteria and terminology has been developed drawing upon Tetra Tech's experience of undertaking EIA, for the presentation of predicted impacts. This is based on a widely used 'matrix approach' to environmental assessment which is based on the characteristics of the impact (magnitude and nature) and the sensitivity of the receptor, as described further below. This is known as a 'Type 3 assessment framework' by Wood (2008)⁴.

Receptor Sensitivity

- 2.4.4 The sensitivity of a receptor refers to its importance, i.e., its environmental value/attributes. This may include a feature's level of statutory designation, for example if a site has a European designation (e.g., Special Area of Conservation) it will generally be regarded as more important/sensitive than another site with a national or local designation (e.g., Local Nature Reserve). The terminology defining sensitivity can vary according to discipline or the methodology being used. However, within this ES sensitivity is generally determined as Very High, High, Medium, or Low.

- 2.4.5 Each individual chapter within this ES considers the attributes of specific receptors in more detail.

Determining Impact Magnitude

- 2.4.6 Magnitude is determined by predicting the scale of any potential change in the baseline conditions. Where possible, magnitude has been quantified; however, where this has not been possible a fully defined qualitative assessment has been undertaken. The assessment of magnitude is carried out considering any 'design mitigation', i.e., relevant design features, in the proposal forming part of the development description. This may result in the need for 'additional mitigation' i.e., that which results from the EIA process, to reduce impacts further. Therefore, the magnitude of impacts both before and after 'additional mitigation' has been stated.

Determining the Significance and Nature of Effects

- 2.4.7 To determine the significance of effect the assessor combines the predicted magnitude of impact (change) with the assigned sensitivity (value) of the receptor.
- 2.4.8 Table 2.3 shows how the interaction of magnitude and sensitivity can be combined to determine the significance of an environmental effect on a scale (note this does not define whether an impact is significant or not, see below). Deviation from the terminology may occur in cases where an established methodology requires this, which will be explained in relevant chapters.
- 2.4.9 The definition of at what level of significance a significant impact arises is provided within the topic method section of each chapter of the ES. This is important in the context of the EIA Regulations which in Schedule 4, Paragraph 5 require a description of the likely significant effects of the development which should cover the direct effects and any indirect, secondary, cumulative, short medium and long-term, permanent and temporary, positive and negative effects of the development. Therefore, environmental effects are described as:
- Adverse or beneficial;
 - Direct or indirect;
 - Temporary or permanent;
 - Short, medium or long term;
 - Reversible or irreversible; and
 - Cumulative and in-combination.
- 2.4.10 Each individual chapter within this ES considers the nature of effects and significance of effects and their definitions in more detail as required.

Table 2.3. Example Significance of Effects Matrix

		Magnitude of Impact			
		Substantial magnitude	Moderate magnitude	Slight magnitude	Negligible magnitude
Sensitivity of Receptor	Very High	Major	Major	Intermediate	Neutral
	High	Major	Intermediate	Minor	Neutral
	Medium	Major	Intermediate	Minor	Neutral
	Low	Intermediate	Minor	Neutral	Neutral

⁴ Wood G., 2008. Thresholds and criteria for evaluating and communicating impact significance in environmental statements: 'See no evil, hear no evil, speak no evil'? Environmental Impact Assessment Review. Volume 28. 22-38.

EIA Assumptions and Limitations

2.4.11 The following key assumptions have been made in preparing the ES:

- All legislative requirements will be met.
- The pre-additional mitigation effects assessment reported within this ES assumes the project will be constructed in accordance with industry standard techniques and currently enforced mandatory minimum standards and assumes suitably experienced contractors will be appointed to design, construct and commission the development. The base assessment is reported on the design, construction, and operation of the development as provided within the description given in **Chapter 3: Description of Development**.
- The potential environmental effects of the construction phase will be controlled through a Construction Environmental Management Plan (CEMP) which would be prepared prior to commencement of construction and would contain all the design and additional mitigation as identified and reported within this ES and any subsequently agreed requirements, expected to be enforced by planning conditions. The details of these documents would be agreed with the LPA prior to construction commencing.

2.4.12 Where further assumptions have been made for individual topic assessments these will be identified within the relevant topic chapters.

2.4.13 Any limitations or uncertainties associated with impact prediction or the sensitivity of receptors due to the absence of data or other factors will give rise to uncertainty in the assessment. Schedule 4, Paragraph 6 of the EIA Regulations requires that an ES state whether any “difficulties (technical deficiencies or lack of know-how) were encountered by the Applicant in compiling the required information.” In this case any limitations in the assessments are referred to in the relevant chapter of this ES.

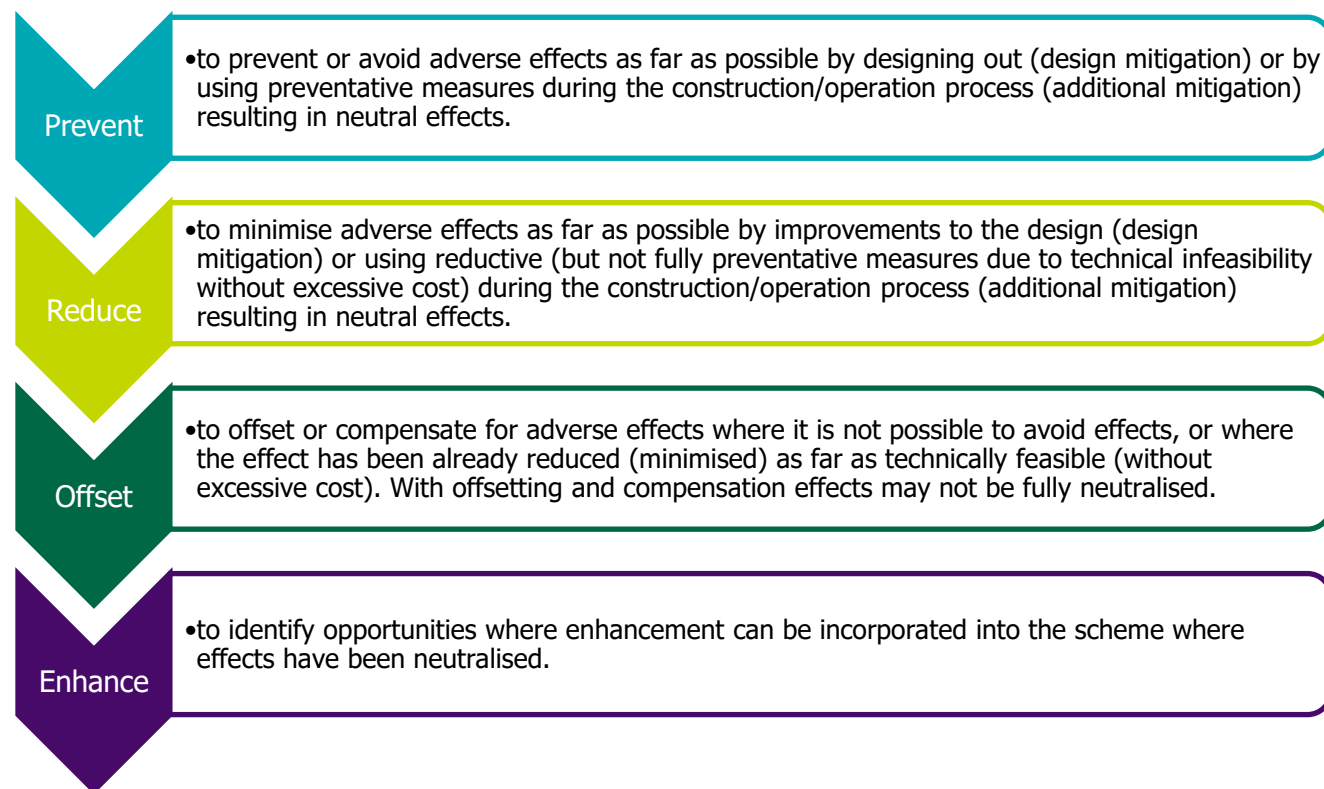
Proposed Mitigation Measures

2.4.14 A description of the mitigation measures is one of the requirements of the EIA Regulations. Schedule 4, Paragraph 7 of the EIA Regulations sets out the information that must be included in an ES and this includes:

“a description of the measures envisaged to avoid, prevent, reduce and if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements”.

2.4.15 In order to reduce the magnitude of the impact and therefore the significance of the environmental effect, where possible, mitigation measures have been identified. The following hierarchy, and terminology, has been used when determining mitigation measures as depicted in Figure 2.1.

Figure 2.1 The Mitigation Hierarchy Applied in EIA



effects, these being the final outcome of the EIA process. Statements are made of whether residual effects are significant or not.

- 2.4.16 When describing mitigation measures, they generally fall under two headings, ‘design mitigation’ and ‘additional mitigation’.
- 2.4.17 Design mitigation is where the design of the site has been altered to take into account a particular issue or accommodate an important feature. This will generally be part of the project description but will also be identified in the relevant chapter under the ‘Mitigation within the Submitted Design’ subheading.
- 2.4.18 The strategic development of the masterplan for the Proposed Development has involved the consideration of potential impacts of alternative designs and layouts of the site. This is described in **Chapter 4: Scheme Development and Alternatives Considered** of this ES. In addition, specific features of the Proposed Development have been included in the fixed design of the site, structures and buildings to avoid or reduce impacts. Therefore, the mitigation of impacts has been integral to the design process undertaken and was facilitated by:
- Early identification of the baseline environment;
 - Preliminary identification of potential significant impacts by technical specialists; and
 - Engagement with key stakeholders including statutory and non-statutory organisations and the public through the consultation strategy.
- 2.4.19 Additional mitigation is all other mitigation that has been identified as a result of the impact assessment that has been undertaken on the fixed design scheme. Clear details of when and how the mitigation measures identified in the chapter will be implemented, have been given. An assessment of ‘residual’ magnitude is conducted following the determination of suitable additional mitigation measures. The subsequent assessment of residual significance identifies the residual environmental

Chapter 3: Description of the Proposed Development

Environmental Statement: Volume 1

784-B048803

3.0 DESCRIPTION OF DEVELOPMENT

3.1 INTRODUCTION

- 3.1.1 This chapter outlines the main characteristics of the Proposed Development that have been assessed as part of the EIA, covering both its construction and operational phases.
- 3.1.2 To set the proposals in context, this chapter begins with a description of the existing site and local geographical and spatial context in relation to key receptors identified as part of the EIA and technical assessments.
- 3.1.3 As this ES supports an outline planning application, this chapter provides the development parameters which form the basis of the assessments presented in this ES. This chapter also outlines the details of mitigation measures embedded within the scheme design and construction and operational activities to reduce any potential effects associated with the Proposed Development

3.2 THE SITE AND LOCAL CONTEXT

Site Description

- 3.2.1 The proposed development is located immediately to the southeast of Junction 16 (J16) of the M4 motorway, approximately 5km to the city centre of Swindon. The site is 7.3 ha in size, the extent of which is identified in the red line plan provided in Figure 1.1 **Chapter 1: Introduction**. The site is an irregularly shaped site predominantly greenfield land in agricultural use with internal boundaries comprised by hedgerows and scattered trees. The site is located in the Wiltshire Council (WC), the UK grid reference is SU104827 (Northing 182709, Easting 410400) and the approximately postcode is SN5 8UD.
- 3.2.2 The site is accessible from the B4005 (Hay Lane) which runs along the west and southern boundaries of the site. The M4 motorway runs along the northern boundary of the site in an east-west direction. There are four ponds within 250m of the site, two located to the east, one to the south and one adjacent to the western boundary, the latter recently constructed as part of improvements to J16. To the east of the site there are agricultural fields divided by hedgerows, to the southwest and south of the site a significant woodland block borders the B4005, directly opposite the site boundary, which continues with further open fields and adjacent to the M4, there is an industrial area and residential areas further to the north, Freshbrook being the closest one.
- 3.2.3 The site is not covered by any specific designation in the adopted Wiltshire Core Strategy, there are no statutory designations within the site and no international designations sites within a 7km radius.

3.3 DEVELOPMENT PROPOSALS

- 3.3.1 For the purposes of the ES, the development proposal section identifies both the construction and operational design features which effect the environment or contribute to the overall environmental

impact of the scheme. Given the nature of the development to provide long term Motorway Rest Area (MRA) services the effects of decommissioning have not been considered.

Schedule of Development Proposed

- 3.3.2 This ES supports an outline planning application for a MRA development at Swindon, seeking outline planning permission for the following:
- 3.3.3 *“Outline application (with Access to be determined) for development of a new Motorway Rest Area (MRA) to provide up to 241 car parking spaces; up to 63 Heavy Goods Vehicle (HGV) parking spaces; coach and caravan parking; amenity building; fuel filling station; new access from B4005; and associated landscaping, infrastructure and ancillary works.”*
- 3.3.4 The proposal includes a potential link to a footway outside the southern boundary of the Site, adjoining the B4005, which will allow for enhanced pedestrian connectivity from the Site and nearby public transport links. These works are deemed as improvements to the highway and will be agreed through discussions with the Applicant, Council and Highways Department.
- 3.3.5 The site red line boundary is shown on **Figure 1.1 of Chapter 1: Introduction**. The planning application boundary for the site, covers a total of 7.3 ha.
- 3.3.6 The extent of Proposed Development, are identified on the plans contained in Figure 3.2 – 3.5, which include:
- Figure 3.1. Illustrative Masterplan: The proposal is depicted on the illustrative masterplan, which has been tested to demonstrate how it is intended to develop the detailed elements of the scheme.
 - Figure 3.2. Parameters Plan: The parameters for the proposed development on which the ES assessments are based is shown in this figure, which also shows the proposed land use of the scheme, the access sites and modes of movement.
 - Figure 3.3. Layout Plan: It is for indicative purposes only and to demonstrate how the scheme will be achieved.
- 3.3.7 These plans along define the Proposed Development and form the basis for the EIA undertaken by each topic.
- 3.3.8 The land use strategy is based upon the provision of a number of services as shown in the plans. In terms of the amounts, the proposal provides the following approximate areas for development, provided in Table 3.1 below.

Table 3.1. Land Use Area Schedule

Indicative/Type Areas	Footprint (m2)		Building Area – GEA (m2)		Covered Area Around Building (m2)	
	Upper parameter	Lower parameter	Upper parameter	Lower parameter	Upper parameter	Lower parameter
Main Amenity Building	3,000	2,200	3,500	3,000	1,200	900
FFS Forecourt (Canopy) (Included as part of overall amenity canopy)	n/a	n/a	n/a	n/a	450	300
HGV FFS Forecourt (Canopy)	n/a	n/a	n/a	n/a	250	125
Sub-Station	200	600	200	600	n/a	n/a
PFS	400	200	400	200	50	30
Total	3,600	3,000	4,100	3,800	1,950	1,355

Building Height Parameters Plan

- 3.3.9
- A range of building heights are proposed across the site, with the scale and massing designed to respond to both surrounding uses and to the strategic location of services. The building heights parameters are illustrated on Figure 3.2. Parameters Plan.
- 3.3.10
- The building heights parameters for the individual units range from 3 to 12 metres. The shorter building will be the Sub-Station, whilst the larger building will be main amenity building.

Transport Context and Site Access

- 3.3.11
- The access and movement parameters are shown on Figure 3.2 which illustrates the extent and location of access infrastructure. The access to the site is a single point situated on the south-east and connected to the B4005, which will allow a further connection to the Strategic Road Network.
- 3.3.12
- Accessibility is considered during the design process for a variety of users. All car parking areas will include pedestrian routes to provide safe and clear access across the area. that will include level access to the main amenity building, fuel filling station and a lift within the main amenity building.

Sustainable Drainage

- 3.3.13
- The provision of sustainable urban drainage systems (SuDS) is a key aspect of the development at Swindon, for which the development will adopt measures to reduce surface water discharge through the use of SuDS. These systems have the additional benefits of providing ecological habitats and biodiversity benefits as well as providing amenity space. The proposed SuDS used in the site will be areas of permeable paving with a voided subbase, rain gardens, green and blue roofs, flood storage areas, underground cellular storage tanks, conveyance swales and attenuation basins which will also provide water quality benefits and new habitats for wildlife.

3.3.14 Additional features are likely to be provided into the design at the appropriate stage.

Figure 3.1. Illustrative Masterplan



Figure 3.2. Parameters Plan

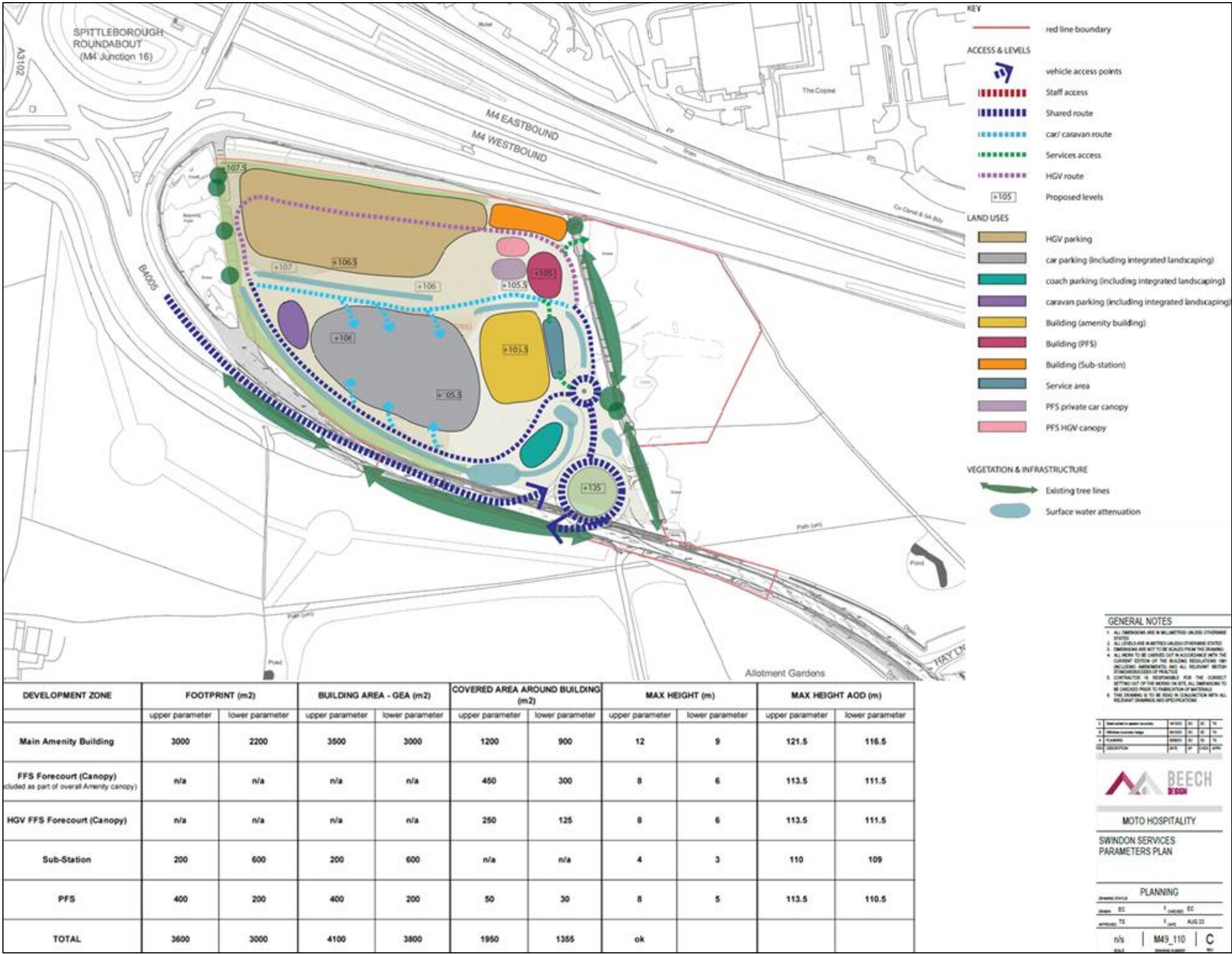
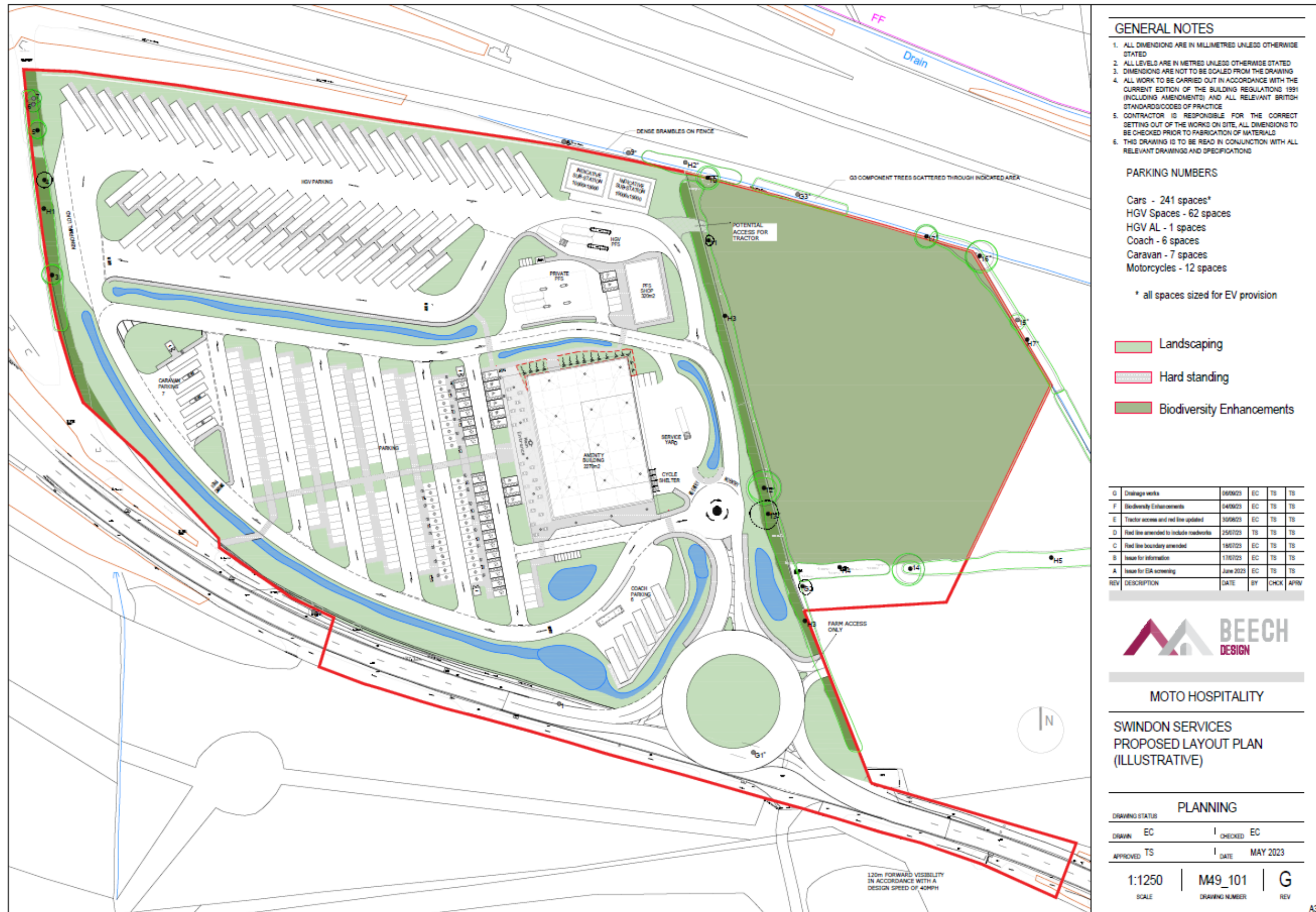


Figure 3.3. Layout Plan



3.4 MITIGATION WITHIN THE SUBMITTED PROPOSED DESIGN

3.4.1 The following sections outline the proposed mitigation which has been embedded within the overall design in order to prevent, reduce or offset any significant effects.

Highways

3.4.2 The embedded mitigation includes:

- Creation of a new roundabout on the south-eastern boundary of the site off the B4005. This roundabout will meet the current design guidance and ensure the speed limits of vehicles; and

Noise and vibration

3.4.3 There are no acoustic mitigation measures in the overall layout of the Proposed Development, therefore, these measures to reduce on-site levels at noise sensitive locations will be agreed in the final design of the site where required, including the building envelope, vegetation buffers and attenuators/screening to mechanical plant.

Air Quality

3.4.4 Within the mitigation measures to reduce air quality effects are:

- SuDS that will improve air quality through natural processes; and
- The provision of electric vehicle charging stations and be future proofed to provide the space for potentially 100% electric vehicle parking, resulting in a reduction of greenhouse gases emissions and promoting sustainable means of transport.

Landscape and Visual

3.4.5 The landscape mitigation proposed addresses a number of mitigation measures that have been incorporated to the embedded design. These are summarized below:

- The built area will be sited toward the lower area of the site (east) and adjacent to trees and mature hedgerows but away from the site edges in order to maximise retention of boundary vegetation;
- The southern boundary will be enhanced by providing Sustainable Drainage planting, supplementary tree and scrub planting, strengthening the landscape edge and creating a buffer of a minimum of 10m; and
- Existing vegetation i.e., hedgerows and trees will be retained and reinforced to minimise the visual impacts on receptors and provide new habitats and wildlife corridors along the perimeter of the site.

Archaeology and Cultural Heritage

3.4.6 The existing landscape framework, tree belts and mature hedgerows will be retained (where practical) and will help contain the Proposed Development from a landscape and visual point of view.

3.4.7 The retention of areas of green space, together with additional green infrastructure in the immediate vicinity of the site will mitigate impacts upon the setting of this asset.

Hydrology

3.4.8 The site lies within Flood Zone 1 with no areas shown to be at risk of fluvial flooding within the immediate area of the Site. There are limited areas of surface water flooding in the vicinity of the site which are associated with the highway drainage pond to the west and south of the site and the land drainage ditches to the east of the site.

3.4.9 The design of the Proposed Development includes mitigation measures which seek to address the main operational effects of the Proposed Development on the water environment. The development will incorporate adequate surface water drainage which aims to manage and store it on site by a series of swales and attenuation storage structures before being discharged to the existing ditch network to the east of the site. This will ensure surface water flood risk is not increased as a result of the development.

3.4.10 Foul water will be discharged to the public network if an appropriate location can be found within the area. This will require discussion with Thames Water.

3.4.11 The development will incorporate adequate surface water drainage / SuDS provision to manage surface water runoff generated within the development and incorporate appropriate overland flow routes (via roadways, green corridor) to safely route design exceedance flows towards an existing drainage ditch running eastward from the eastern boundary of the site.

3.4.12 Surface water runoff from the Proposed Development will be intercepted by onsite drainage systems designed to contain the runoff at the equivalent greenfield rate, with the additional volume stored within attenuation basins before being discharged to the local watercourses.

3.4.13 The onsite drainage systems would be designed in accordance with the relevant national standards and guidance including the SuDS Manual, Preliminary Rainfall Runoff Management for Developments and the Interim Code of Practice for Sustainable Drainage Systems. In accordance with the SuDS Manual and the draft National SuDS Standards, the drainage design for the site will address the water quality treatment requirements for the levels of treatment required based on source and receptor. The drainage design will take due consideration of EA pollution control requirements and will consider the use of SuDS features (including swales and ponds) to protect water quality and quantity of the receptors (surface water features, groundwater aquifers).

Ecology

3.4.14 The scheme has been developed following an iterative process of design, with a number of mitigation measures incorporated and embedded as part of the proposals. Particular measures incorporated in relation to ecology are summarised below.

- Identification and design of a site-adjacent biodiversity offset area to compensate for any biodiversity loss and increase and enhance the biodiversity;
- Maintenance of a dark corridor for wildlife in the east of the site;
- Provision of green roofs as new habitats for invertebrates and foraging birds;

- Provision of connective habitat in the form of corridors of non-development land around the perimeter of the site;
- Incorporation of bat and bird boxes in the biodiversity offset area;
- Provision of mixed scrub along the northern and southern boundaries of the site that will create nesting opportunities for dunnoek, whitethroat and wren. Also, it will provide acoustic attenuation, resulting in an improvement to habitat conditions; and
- Creation of SuDS ponds and ditches, hedgerows, and enhancement of the east field to other neutral grassland which will provide new habitats for foraging animals and a greater diversity of plants and invertebrates.

3.5 CONSTRUCTION PROPOSALS

Demolition

3.5.1 There is no demolition required as part of the proposals.

Construction

3.5.2 Construction of the Proposed Development will involve the following stages:

- Enabling works (earthworks and utilities);
- Landscape and ground profiling;
- Installation of drainage tanks and infrastructure;
- Construction of a motorway services;
- Installation of services and commissioning; and
- Landscaping and internal fit out.

Timetable of Events and Indicative Programme

3.5.3 Under the current programme, it is assumed that construction will take place between November 2025 and January 2027. The total construction period used in the ES is therefore 14 months, subject to timely granting of planning permission(s).

3.5.4 The selected main contractor will be required to prepare a detailed construction and procurement programme identifying key tasks and milestones to ensure that enhancement of the project is properly resourced and sequenced in accordance with the overall project duration.

Site Preparation

3.5.5 In order to prepare for the commencement of construction, a compound area will be established early in the programme. This area will accommodate construction offices, welfare facilities and compounds, as well as workforce parking, a materials lay-down area and on-site fabrication.

3.5.6 In considering the location and setup of site project offices and welfare facilities, the following will apply:

- All reasonable precautions will be taken for the operation of plant and equipment, to avoid nuisance and excess noise impact on the surrounding residents / neighbours;
- The visual intrusion of construction activities on nearby residents and users of local facilities and amenities will be contained and limited as far as practical;
- Emergency response plans for all phases of construction;
- Measures such as exclusion zones / hoardings / fencing / temporary screening will be used to reduce noise and visual intrusion will be set in place as far as practicable;
- Transport infrastructure provision and the installation / diversion of new / utility supplies; and
- The standard of fencing / screening during construction on phases / plot Sites will be selected in order to maintain effective Site security.

Construction Activities

- 3.5.7 It is unclear at this stage what the underlying ground conditions are, but this will be confirmed prior to construction. It is assumed it may require piled foundations, or traditional or gravity pad type foundations, depending on the specific need.
- 3.5.8 In order to assess the worst-case scenario as part of the ES, assumptions have been made in terms of the plant that will be used on site.

Table 3.2. Construction Activities

Phase Description	Activity
Groundworks and Site Establishment	Wheeled Mobile Crane
	Delivery Wagons
	Generator
	Tracked Excavators
	Hand Tools
	Dump Trucks
	Dozer (Towing Roller)
Construction of Proposed Development (including all ancillary works)	Dump Trucks
	Tracked Excavators
	Concrete mixer truck and pump
	Delivery Wagons
	Small cement mixer
	Wheeled mobile telescopic crane
	Lifting platform
	Telescopic handler
	Compressor for power tools

	Generator for Lighting
	Hand Tools
	Circular saw
	Road Planer
	Tipper lorry
	Asphalt paver
	Vibratory roller and plate

Predicted Traffic Movements During Construction

- 3.5.9 The main deliveries and site traffic will be related to the following:
- Daily site staff and labour;
 - Movements arising from the groundworks;
 - Aggregate and concrete deliveries for early activities;
 - Deliveries of building components and services equipment;
 - Periodic inspections, visitors, and inspectors; and
 - Disposal of waste material.
- 3.5.10 During construction, no specific mitigation is considered necessary with regards to the volume of traffic however, a CEMP accompanies this outline planning application and will be agreed with WC, specifying any additional mitigation measures, if considered necessary.

On Site Traffic management

- 3.5.11 Management of traffic within the Site will be the subject of detailed construction logistics planning, to be undertaken at a later stage once further detailed planning is undertaken and the Principal Contractor is identified. Appropriate management of any construction traffic will be undertaken, including:
- The use of appropriate and approved routes for construction vehicles including approved routing plans;
 - The management of working hours and delivery times to minimise disturbance caused by traffic (e.g., avoiding deliveries during peak hours);
 - Covering loads coming to and leaving the development;
 - Provision of wheel washing / vehicle cleaning facilities on site; and
 - Inspection of local highway network and cleaning as necessary.
- 3.5.12 The above measures will be secured by a suitably worded planning condition for a CEMP or Construction Traffic Management Plan (CTMP). All activity planning and construction works will be

undertaken in accordance with the requirements of legislation, regulations, and best practice guidelines.

Working practices

- 3.5.13 Prior to the commencement of construction on site, an adequately developed principal contractor's 'Construction Phase Plan' will be prepared including:
- Pre-construction Health and Safety Information as required by the Construction Design and Management (CDM) Regulations 2015, of the proposals. This is a requirement of the EIA Regulations which in Schedule 4, Paragraph 4 require a description of the aspects of the environment likely to be significantly affected by the development (HMSO, 2017);
 - Pre-construction Site Waste Management Plan and Site Waste Management Plan (SWMP); and,
 - Construction Environmental Management Plan (CEMP).
- 3.5.14 In addition, the following document will be prepared/revised as necessary by the CDM Co-ordinator:
- Construction Phase CDM Health and Safety Plan as required by the CDM Regulations 2015.
- 3.5.15 The construction works will be monitored by an Employers Agent, who will also liaise with the various environmental and other advisers who will have input into the project.
- 3.5.16 The base environmental effects assessment reported within this ES assumes the project will be constructed in accordance with industry standard techniques and mandatory minimum standards and assumes suitably experienced contractors will be appointed to design, construct and commission the development. A non-exhaustive list of key standards working techniques/practices taken into account in the base assessment is provided in the following sub-sections.

Construction Works Times

- 3.5.17 Construction activities on the Site will normally be carried out between 08.00 hours to 18.00 hours Monday to Friday and 08.00 hours to 13.00 hours on Saturdays, with no such activities on a Sunday or a Public or Bank Holiday, which will be secured via a suitable planning condition. Any works required to take place outside of these periods will be agreed in advance with WC.

Construction Materials

- 3.5.18 No materials will be used in the Proposed Development that by their nature or application, or use contravene any British Standard or Code of Practice, or which contravenes the recommendations of Good Practice in the Selection of Construction Materials¹ as well as the updated version Good Practice in the Selection of Construction Materials (Hoare Lee and Partners, 2011)².
- 3.5.19 Furthermore, where possible the Proposed Development will ensure the use of eco-friendly and local materials to reduced embodied carbon and carbon dioxide emissions from transportation. Amongst these materials are:
- Bricks made from British clay and from companies with good mix of renewables in their production;

¹ Ove Arup and Partners. (1997). Good Practice in the Selection of Construction Materials.

² Hoare Lee and Partners. (2011). Practice in the Selection of Construction Materials.

- Timber glulam structure from FSC certified structures;
- Recycled steel;
- Precast concrete;
- Straw bales and plant-based polyurethane foam;
- Sustainable concrete or post-tensioned concrete; and
- Hemclad wall panel.

3.5.20 Further information could be found in the Sustainability and Energy Statement prepared in support of the planning application.

Construction Water Supply and Use

3.5.21 Water usage during construction will be used for the purposes listed below and will utilise where possible, local grid connections. If this is not possible, water will be supplied by bowser.

- 3.5.22 The CEMP will include a plan and specific method statements for how water efficiency will be achieved. This could include measures such as:
- Auto isolation of cleaning devices (hoses): The contractor will ensure flow from cleaning devices auto-isolates once it is no longer in use. This ensures there is no possibility of an unused cleaning device being left operational when it is not in use. The contractor will look to identify the high-pressure washer system which provides the required level of cleaning, with the lowest water pressure (to maximise the water savings on offer);
 - Dust suppression activity: The contractor will only use water for dust suppression when on site temporary/permanent road conditions require it in order to limit water use over the duration of the project;
 - Road sweeping: The contractor will only use a road sweeper system with built in water recycling;
 - Washing of ready-mix concrete wagons: If a batching plant is set up on site, and washing of wagons will be undertaken on site then this must occur in a designated hard standing area with wastewater collection sump, and the wastewater will then be re-used as an ingredient in the concrete mixing process, up to the maximum amount which can be used; and
 - Commissioning and testing of services: The contractor will follow the advice in the relevant Building Services Research and Information Association (BSRIA) guidance. The water used for flushing building services should be isolated as soon as possible after the flush water turns clear.

Construction Compound

3.5.23 A contractor working area will be made available, and the location will be clearly delineated on the Site and agreed with WC to ensure that no unnecessary disturbance is caused to any sensitive areas and is located at least 25m from any surface water feature.

Safe Storage of Fuel/Oil

3.5.24 Particular attention will be given to the storage and use of fuels for the plant on Site. Drainage within the temporary, secure, Site compound, where construction vehicles will park and where any diesel fuel will be stored, will be directed to an oil interceptor to prevent pollution if any spillage occurs. Diesel storage and refuelling will be within a designated area or self-bunded tank.

Minerals and Soils

3.5.25 While direct mitigation compensation for the loss of agricultural land is not practicable within the development area it is proposed to preserve the integrity of this topsoil by undertaking the following additional measures. Following the removal of vegetation, the existing topsoil resources will be stripped and stored in stockpiles no more than 2m high, for future use in landscape areas, or sold for suitable reuse off Site. In order to help preserve the integrity of the topsoil this operation will be done in accordance with The Construction Code of Practice for the Sustainable use of Soils on Construction Sites, which will include the production of a soil resource plan.

Construction Noise and Vibration

- 3.5.26 The main contractor will refer to the guidance provided within BS5228:2009+A1:2014 in order to minimise disruption during construction. Additionally, the principal form of noise control will comprise site working hours according to any conditions within the planning consent and avoiding unsocial working hours where possible. If there is the requirement to undertake ‘noisy’ work outside of the agreed hours, further consultation would be undertaken with WC to obtain prior agreement that the proposed works would be acceptable. These hours should be rigorously observed for any operations which are likely to generate noise levels noticeable by neighbouring residents. Any exceptions deemed essential to the works which need to be authorised by the Local Authority must also be communicated with the residents.
- 3.5.27 In conjunction with effective communication of site activities and scheduling, liaison with local residents is essential in cultivating a positive attitude in the community. A dedicated telephone number and designated staff contact should be made available to respond to any complaints or queries, with a messaging service for out of hours enquiries. Information on current and forthcoming activities should be made as freely available as possible.
- 3.5.28 Further details regarding the likely noise and vibration effects of the Proposed Development are contained within **Chapter 6: Noise and Vibration** of this ES. This includes examples of noise control measures during the construction phase that should, as a minimum, form part of the CEMP.

Construction Air Quality and Dust

3.5.29 The works to deliver the scheme will require a number of construction activities that traditionally raise issues of air quality, in particular dust and air borne matter. Other than negligible tailpipe emissions from onsite construction vehicles and equipment, the main emissions during construction are likely to be dust and particulate matter generated during earth moving (particularly during dry months), from re-suspended dust on haul roads and from wind whipping of friable excavated material.

3.5.30 Readers should refer to the supporting **Chapter 7: Air Quality** for a detailed appraisal of potential air quality impacts and mitigation. However, the main potential effects of particulates/dust are:

- Visual – dust plume, reduced visibility, coating and soiling of surfaces leading to annoyance, loss of amenity, the need to clean surfaces;
- Physical and/or chemical contamination and corrosion of artefacts;
- Coating of vegetation and soil contamination;
- Health effects due to inhalation e.g., asthma or irritation of the eyes; and
- Vectors for other contaminants associated with the former use.

3.5.31 Care will be taken regarding dust emissions so that they are kept to a practicable minimum, especially when working in the vicinity of residential or commercial properties in the vicinity of the Site. Suppression and mitigation will be required during dry conditions with the following dust reduction measures being employed:

- Sheetting of vehicles transporting materials to and from Site;
- Limiting the speed of general vehicles within the Site;
- Temporary surfacing to haul roads where possible within the programme;
- Haul roads to be regularly cleaned;
- Provision of wheel washing facilities at access points onto local roads; and
- Drop heights minimised and all skips enclosed where possible.

3.5.32 No materials arising from the demolition of existing structures on-site, the construction of the road or any material from incidental works will be burnt on the Site.

3.5.33 The main contractor will comply with the BRE Code of Practice to control dust from construction and demolition activities, unless agreed otherwise with WC. The requirements of the code will apply to all work at the Site, access roads and adjacent roads.

3.5.34 Further details regarding control measures for likely air quality effects of the Proposed Development will be included within the sites CEMP.

Construction Landscape and Visual Impact

3.5.35 Mitigation measures embedded in the design include the retention of much of the existing landscape infrastructure. This will reduce adverse effects on the character of the site through the removal of the characteristic landscape features but will also create visual screening during the construction phase.

3.5.36 Trees will be protected in accordance with BS5837 Trees in Relation to Construction. Prior to commencement of the construction works, the main contractor will be required to erect temporary protective fencing around Tree Protection Zones in accordance with the approved Tree Protection Plan. Construction works in the vicinity of retained trees within the Site and on adjacent land shall be carried out in accordance with recommendations in ‘BS5837:2012 Trees in relation to design, demolition and construction’ and approved Arboricultural Method Statement to safeguard trees and

hedges. Landscape planting and topsoiling works within retained tree root protection areas shall be carried out in accordance with ‘BS3998:2010 Recommendations for tree work’ and generally.

3.5.37 All boundaries of the Site will be secured by means of temporary fencing and/or hoarding for safety and security reasons and to reduce the visual impact of the Site during the construction period.

3.5.38 Further details of the visual impacts during the construction phase of the development are provided in **Chapter 8: Landscape and Visual Impact Assessment** of this ES.

Construction Ecological Mitigation

3.5.39 A CEMP, to be agreed with WC as required, will include:

- Erection of tree protection fencing around woodlands, along hedgerows and around trees in accordance with BS5837:2012 to prevent encroachment of site vehicles or storage;
- Storage of materials and vehicles away from the watercourses and ponds;
- Dampening down of potential sources of dust;
- Adherence to (now redacted) EA Pollution Prevention Guidelines;
- Implementation of engineering safeguards as part of demolition and construction works to control surface water run-off and avoid contamination of watercourses in the surrounding landscape. This could include measures such as the use of a temporary silt trap in order to form an intercept for silt and other potential pollutants;
- All contractors will be briefed as to the possible presence of protected and notable faunal species within the Site, with particular reference to the implications of legislation and licensing;
- To avoid an offence under the WCA, the potential loss of active nests during construction will be avoided by either undertaking clearance of potential bird nesting habitat outside of the bird nesting season (March to August inclusive) or, if necessary, preceding any clearance with an inspection by a suitably qualified ecologist. Any nests identified will be cordoned off and protected until they cease to be active. Disturbance from noise will be minimised by the adoption of good working practice, such as restricted hours of working and noise-reducing construction measures;
- Any trenches or deep pits within the Site that are to be left open overnight will be provided with a means of escape should a Badger or other mammal enter. This could simply be in the form of a roughened plank of wood placed in the trench as a ramp to the surface. This is particularly important if the trench fills with water;
- Any trenches/pits will be inspected each morning to ensure no animals have become trapped overnight;
- The storage of any chemicals at the Site will be contained in such a way that they cannot be accessed or knocked over by any roaming animals;
- Food and litter will not to be left within the working area overnight;

- To minimise adverse effects as a result of lighting during the construction phase, temporary lighting will be minimised, wherever practical. Where required for health and safety, security or other reasons, it will be positioned so as to minimise light spill on to woodlands, hedgerows and other boundary features, with consideration given to column height, lighting intensity and timing of lighting in order to minimise any potential for light spill; and
- Disturbance from noise will be minimised by the adoption of good working practice.

3.5.40 Further details of the ecological impacts during the construction phase of the development are provided in **Chapter 11: Cumulative and Synergistic Effects** of this ES.

Construction Drainage

- 3.5.41 The construction works will be undertaken in accordance with a CEMP or similar. The CEMP is an appropriate document within which appropriate procedures and methods can be specified to protect the water environment. This will include a series of specific method statements identifying methods of working and controls to address the surface water environment impacts. The CEMP will be implemented during the construction phase. This will include guidance on ‘Pollution prevention for businesses’ on gov.uk³ as a minimum.
- 3.5.42 Existing watersheds will be outlined and retained where possible to avoid localized issues with catchment transfer, that will be used through a suitable method of surface water disposal which will consider a restricted discharge rate equivalent to the pre-development greenfield QBAR rate.
- 3.5.43 Any additional runoff generated by the Proposed Development will be accommodated in strategic sustainable drainage features such as ponds, basins and swales that will discharge the runoff at the pre-development greenfield QBAR rate via outfall to nearby watercourses to minimise risk of sedimentation in downstream watercourses.
- 3.5.44 Excavation activities will be carefully monitored and co-ordinated with forecasted dry periods, where possible, with excavation works covered over during periods of heavy rain to minimise potential for the mobilisation of sediment and contaminants.
- 3.5.45 Pathways and haul roads along high-trafficked routes will be created for the movement of heavy vehicles and machinery, reducing the area affected. These will be kept clear of mud deposits and will be damped down during dry and windy seasons to reduce dust. The contractor will provide additional street cleaning facilities as necessary to keep surrounding highways clear of mud and prevent sediment contaminating surface water runoff.
- 3.5.46 The movement of plant machinery and vehicles and the storage of materials during the construction works will be kept away from surface water features.
- 3.5.47 Plant machinery and vehicles will be maintained in a good condition, checking for signs of wear and tear on a regular basis and with washing and dust suppression measures used to prevent the migration of pollutants (particularly in relation to works using concrete and with areas where dust and mud can build up).

- 3.5.48 Any relevant fuels, lubricants or chemicals will be stored in accordance with the appropriate Environment Agency Environmental Management Guidance with an impermeable base and suitable bunding to prevent discharge. Regular testing of the storage tanks and pipes will be carried out.
- 3.5.49 All waste waters from site welfare facilities should be contained for disposal to a licensed offsite disposal facility and will not be discharged to the ground or to watercourses.
- 3.5.50 The site will be adequately secured with hoarding and security staff to counteract vandalism, theft and breakage thereby minimising the risk of a pollution incident occurring.
- 3.5.51 Effective contingency plans will be put in place to manage the risk associated with accidents and/or unforeseen circumstances. For example, contamination response procedures (including training on the use and location of spill kits) will be disseminated to construction personnel. An emergency response plan could be developed based on the Stop-Contain-Notify principal in consultation with the Environment Agency. The plan would include the need for staff training in emergency procedures and the provision of appropriate emergency response equipment.
- 3.5.52 Further details of the flood risk impacts during the construction phase of the development are provided in **Chapter 9: Hydrology, Flood Risk and Water** of this ES.

Construction Lighting

- 3.5.53 There will be a requirement for temporary lighting to be provided to illuminate temporary car parking areas, site roads and the contractor’s storage compound; and working areas for the late afternoons during the winter months only.
- 3.5.54 To ensure that construction lighting does not affect nocturnal wildlife or the amenity of residents or create a statutory nuisance under the Environmental Protection Act 1990 (as amended).
- 3.5.55 Energy efficient options for site facilities will be incorporated wherever possible. These may include energy efficient light bulbs and automatic controls. BS 5489 Parts 1 and 9 (Road Lighting) and Institute of Lighting Engineers (ILE) guidance notes for reduction of light pollution will be complied with.

Construction Waste

- 3.5.56 The Proposed Development will actively seek to reduce the amount of waste sent to landfill during the construction phase through sustainable design and procurement together with the reuse or recycling of materials, wherever possible.
- 3.5.57 Waste will be managed in accordance with the Waste Hierarchy, and as such waste minimisation will be given the highest priority. The reuse and recovery of waste will be encouraged by proactively identifying opportunities for the on-site reuse of materials (for example in landscape contouring), and by appointing a waste contractor who can demonstrate high levels of recycling. Energy recovery will be the preferred option for managing residual waste from construction works and only residual waste which has no potential for energy recovery will be sent for landfill disposal. All reasonable measures will be taken to ensure that levels of residual waste sent to landfill are kept to a minimum.

³ DEFRA and the Environment Agency. (2016, updated 2019). Pollution prevention for businesses.

- 3.5.58 It is an ambition to use resources which have been sourced locally, where these are available, and also to use sustainable means of transport, where possible. Construction materials will be procured which have a high proportion of recycled material, where this is practicable and does not adversely affect the integrity and durability of the materials.
- 3.5.59 Modern methods of design and construction using pre-fabricated units will help keep waste arisings to a minimum. The frames and envelopes will be pre-fabricated with formwork remaining on site. All construction waste produced during the site preparation works that cannot be re-used on site will be segregated and recycled. Efficient building forms and services will be used that will minimise the volumes and numbers of on-site manufactured components required to reduce the potential for waste generation. Scaffolding, hoarding and shuttering will be disassembled and used on other phases of the project and then removed from site for use on subsequent construction projects.
- 3.5.60 Construction sites will be laid out to ensure that there is sufficient space for waste from the construction phase to be segregated into separate containers and stored prior to removal and off-site management. However, the regular removal of waste and recycling will minimise the amount of external space required for waste storage both in the construction and operational phases of the developments.
- 3.5.61 Under the Duty of Care Regulations producers of waste have a legal obligation to ensure wastes are handled responsibly and in line with relevant legislation and guidance. The strict management of waste during the construction phase of each development by site operatives Training sessions for relevant construction staff.

Health and Safety

- 3.5.62 All work will be undertaken to relevant Health and Safety legislation. The project will be supervised in accordance with the revised CDM Regulations 2015. Risk Assessment will be undertaken for each work package prior to activities taking place. A CDM Health and Safety File will be prepared and, after completion of the construction works, will be handed over to the applicant.

3.6 SECURING ENVIRONMENTAL MANAGEMENT - THE ENVIRONMENTAL MANAGEMENT PLAN AFTER OPERATION

- 3.6.1 The Applicant has identified environmental management practices through the iterative EIA process. It is expected that the environmental management practices identified in this ES will be secured via a planning condition should the application be approved. An Environmental Management Plan (EMP) would be prepared from the mitigation information provided within the topic chapters which form the preliminary EMP.

Construction

- 3.6.2 The contract between the applicant and the company contracted to construct the development will specify the measures to be taken to reduce or mitigate the environmental effect of the construction process, to be agreed with the regulators within a CEMP. These measures will consist of three main types:
- Conditions to be adhered to under the planning permission;

- Any requirements of the Environmental Agency or any other regulatory organisation; and
- And other relevant mitigation measures identified in this ES.

- 3.6.3 The CEMP file will be prepared and, after completion of the construction works, handed over to the applicant.

Operation

- 3.6.4 The site will be managed by Employer's Agent whose duties will include compliance with statutory environmental requirements and will be agreed at a future planning stage.
- 3.6.5 Effective communication underpins the whole system of environmental management, ensuring appropriate information passes between the applicant, the contracted developer staff and the consultants and contractors whom they engage. This ensures that environmental considerations are fully integrated into the management of the development throughout construction, and during the operation phase.

Chapter 4: Scheme Development and Alternatives Considered

Environmental Statement: Volume 1

784-B048803

4.0 SCHEME DEVELOPMENT AND ALTERNATIVES CONSIDERED

4.1 INTRODUCTION

- 4.1.1 Under the EIA Regulations (2017)¹ there is a requirement to outline the reasonable alternatives relevant to the Proposed Development and its specific characteristics which were examined by the Applicant, the design and technical teams to provide an indication of the primary reasons for selecting the chosen option.
- 4.1.2 This chapter of the ES outlines the feasibility of the site for development and its planning context and describes the alternatives considered and provides an overview of how the scheme has evolved, and the factors which have influenced the proposals described in **Chapter 3: Description of Development**.
- 4.1.3 A number of alternative scenarios were investigated as part of the design process at the initial stage and consulted upon with technical consultants. These are discussed further under Section 4.3 below. The site then progressed to a more detailed feasibility study that included a site visit, technical assessments and planning policy review, outlined within the relevant technical and planning documents as well as within this ES.

4.2 SITE FEASIBILITY AND IDENTIFICATION

Planning Context

- 4.2.1 There is no requirement in the EIA Regulations for the ES to demonstrate compliance with planning policy. Nevertheless, the ES informs the planning decision and in the undertaking of EIA, significance of effects are often judged in the context of planning policies and other legislative requirements. As such a brief consideration of the planning policy relevant to the Proposed Development is provided as follows for context. For a detailed consideration of compliance with planning policy, reference is made to the Planning Statement provided with the planning application.

National Planning Policy Framework (2023)²

- 4.2.2 The National Planning Policy Framework (NPPF) sets out the Government's policy approach to planning, therefore the most paragraphs were identified as follows:
- 4.2.3 Chapter 9: Promoting Sustainable Transportation:
- Paragraph 106.e, states that:
- “Planning policies should...provide for any large scale transport facilities that need to be located in the area, and the infrastructure and wider development required to support their operation, expansion and contribution to the wider economy. In doing so they should take into account whether such*

development is likely to be a nationally significant infrastructure project and any relevant national policy statements”

- Footnote 44 of Paragraph 106.e, states that:

“Policies for large scale facilities should, where necessary, be developed through collaboration between strategic policy-making authorities and other relevant bodies. Examples of such facilities include ports, airports, interchanges for rail freight, public transport projects and roadside services. The primary function of roadside services should be to support the safety and welfare of the road user (and most such proposals are unlikely to be nationally significant infrastructure projects).”

- Paragraph 109, states that:

“Planning policies and decisions should recognise the importance of providing adequate overnight lorry parking facilities, taking into account any local shortages, to reduce the risk of parking in locations that lack proper facilities or could cause a nuisance. Proposals for new or expanded distribution centres should make provision for sufficient lorry parking to cater for their anticipated use.”

Strategic Road Network and the Delivery of Sustainable Development (DfT Circular 01/2022)³

- 4.2.4 This policy paper sets out how National Highways addresses the growth and development of the road network by:

- “Engaging with the planning system;*
- Fulfilling sustainable economic growth whilst maintaining, managing and operating a safe and efficient strategic road network; and*
- Addressing the requirements for roadside facilities, including heavy goods vehicles (HGVs) driver services and new provisions for zero emissions vehicles”.*

- 4.2.5 The Government has recommendations for motorists to have regular breaks in order to keep safety on roads and therefore roadside facilities are considered crucial facilities to provide opportunities for motorists to rest. On this basis, the policy paper sets out the following:

“...the maximum distance between signed motorway service areas should be 28 miles. Speed limits on the SRN vary and therefore, applying the same principles, the maximum distance between signed services on APTRs should be the equivalent of 30 minutes driving time.”

- 4.2.6 Furthermore, this policy paper recognizes a shortage of parking facilities for HGVs on certain parts of the Strategic Road Network (SRN) and at certain times. Freight facilities are key spaces for drivers of heavy goods and public service vehicles to comply with requirements and regimes of statutory breaks and other working time restrictions. For this reason, one of its objectives seeks to ensure the provision of HGV parking by expanding existing freight parking sites and creating new facilities on or near to the SRN. The following spacing requirements should be considered:

- “the maximum distance between motorway facilities providing HGV parking (being service areas, rest areas or truckstops) should be no more than 14 miles; and*

¹His Majesty's Stationery Office. (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

² Ministry of Housing, Communities and Local Government. (2023). National Planning Policy Framework.

³ Department for Transport. (2022). Strategic Road Network and the Delivery of Sustainable Development.

- ii. *The maximum distance between All-purpose Trunk Roads (APTRs) facilities providing HGV parking (being service areas or truckstops) should be the equivalent of 20 minutes driving time for HGVs.”*

4.2.7 In terms of location, the policy document describes on-line service areas (between junctions) as more accessible and attractive locations for SRN users. However, where these cannot be delivered due to mandatory requirements, developments that would help alleviate the shortcut in areas that share a common boundary with the highway at a junction with the SRN would be preferred.

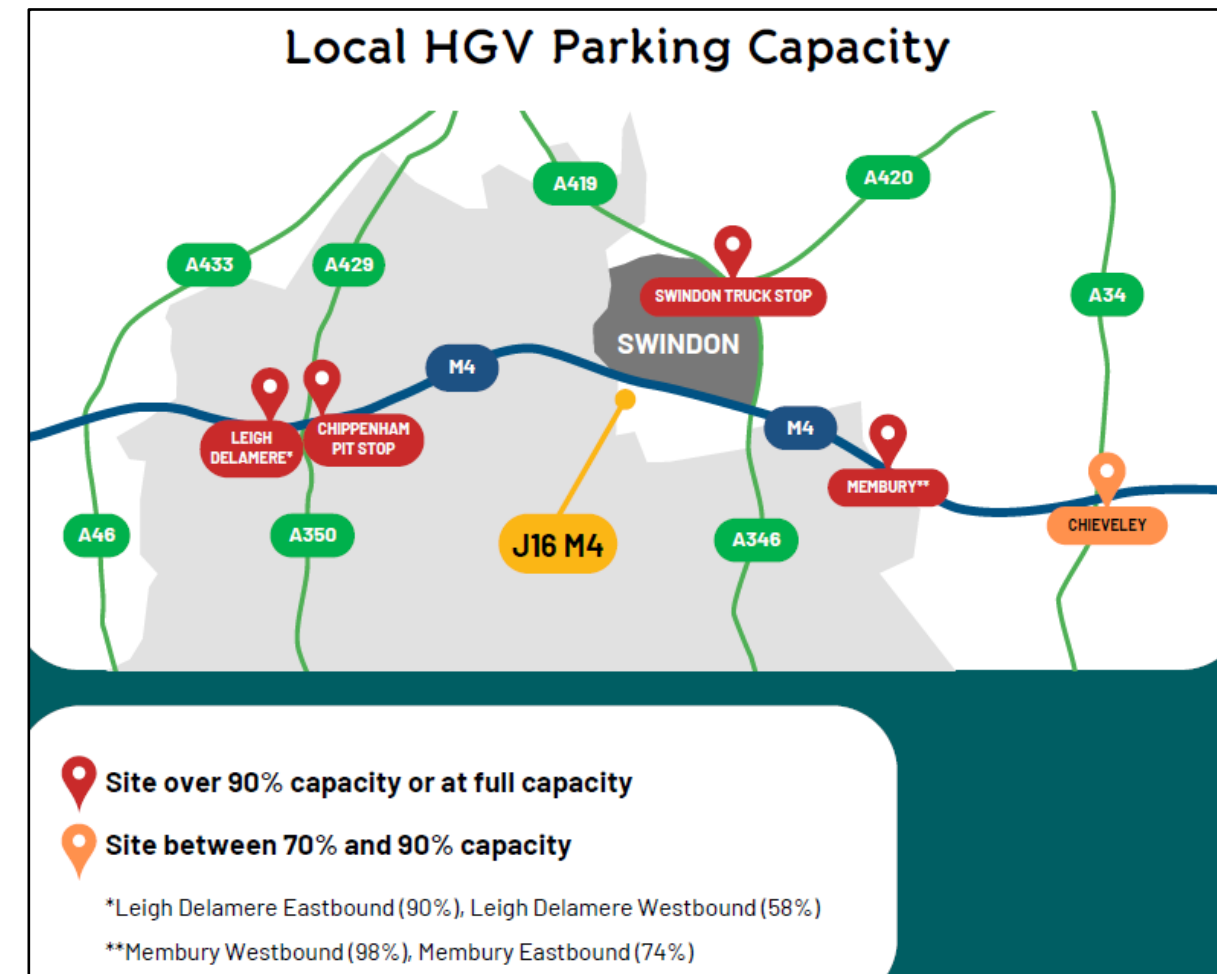
Site History

4.2.8 The proposed site does not have previous planning applications reported within the Wiltshire Council (WC) planning application portal.

4.3 SITE ALTERNATIVE AND REQUIREMENTS

- 4.3.1 In order to have safer journeys that emphasise drivers’ welfare, the Government has established in its Drivers’ Hours⁴ website requirements for hours of driving for HGVs, bus and coach drivers, and has recommended a break of at least 15 minutes every 2 hours for other types of motorists.
- 4.3.2 Nonetheless, the location of Motorway Service Areas (MSA) does not allow drivers and motorists to achieve these requirements and recommendations due to distances between the existing services and critical shortage of parking spaces. Figure 4.1 shows the current service area locations in the area and its HGV parking capacity.
- 4.3.3 Sites such as Swindon Truck Stop and Chippenham Pit Stop have reached HGV parking maximum capacity, leading HGVs drivers to rest and make stops in unsuitable locations such as laybys and industrial estates.
- 4.3.4 On this basis, to ensure the recommended stopping distances stated by the NPPF and the DfT Circular 01/2022, and to improve safety in the SRN, services (in this case an MRA) should be provided between junction 14 and 18 of the M4.
- 4.3.5 A ‘do nothing’ or no development scenario would exacerbate this situation and continue to affect safety and driver welfare.
- 4.3.6 In terms of considering alternative sites, this parcel of land is considered a strategic location because of the open countryside feature with minimal settlements in the area. It also sits to the south of Swindon in a built up area with direct access to junction 16 of the M4 which makes it the best location for an MRA. A sequential test produced has also identified no suitable sites for the MRA on junction 14 and junction 18 of the M4 as on-line areas.
- 4.3.7 Furthermore, the site has been designed in order to provide the best service and meet the requirements set out by the Annex A: Roadside facilities tables of the DfT Circular 01/2022 to alleviate the high demand for HGV parking and electric vehicle charging stations.

Figure 4.1. MSAs locations and capacity



4.4 APPROACH TO CONSULTATION

- 4.4.1 This section details the consultation that has been undertaken to demonstrate that the Applicant has actively informed and involved the local community about the plans for a revised scheme in accordance with WC’s Statement of Community Involvement and national planning guidance. It briefly describes the main consultees who were involved in influencing the design, and details the key findings drawn from the various consultation meetings or events. It also gives an overview of all consultation activity undertaken.
- 4.4.2 The Applicant and their consultant team have undertaken extensive discussions with statutory and non-statutory consultees, the local community, and landowners, all having an influence over the evolution of the design and the scope of the EIA with the accumulated findings. Overall, the consultation approach included the following actions:
- Engaging with strategic leaderships;
 - Engaging with stakeholders; and

⁴ Government. (n.d.). Drivers’ hours.

- Consulting with the local community.
- 4.4.3 Letters and emails were sent to the strategic leaders, local ward and division members in order to disclose information about the emerging proposal and arrange meetings to discuss them further and ascertain their feedback. These letters were distributed in two phases. Whilst phase 1 was focused on leaderships of the WC such as cabinet members and leaders, phase 2 was sent to the Swindon Borough Council (SBC). This approach was undertaken due to the proximity of the Proposed Development to SBC that could lead to indirect impacts to the area.
- 4.4.4 As part of the engagement, different meetings were sought through emails and held during the consultation period with the local stakeholders that led to amendments to the scheme and feedback of the proposal. The following stakeholders were considered:
- Local Ward/Division Members;
 - Local Wiltshire Council Division Members;
 - Local Swindon Ward Members;
 - Lydiard Tregoze Parish Council;
 - Royal Wootton Bassett Town Council; and
 - Other Parish Councils.
- 4.4.5 Moto Hospitality created a range of consultation materials (including a leaflet, consultation website and vision document) in order to provide information about the Proposed Development and obtained feedback and comments from stakeholders and local community. This information detailed the proposal site and objectives, standing out the importance of providing a MRA in the area aiming to improve safety on the SRN. This information was circulated to stakeholders (including MPs, councillors and Parish Councils) on Wednesday 13th September and was later distributed by post on Friday 15th September 2023 to 140 households and business near to the site and promoted via local social media channels and the local press. Contained within this consultation leaflet was a proposal overview and the contacts to provide feedback that were available until 29th September 2023. Some of these ways of contacts included freephone, email, and the dedicated website www.Moto-M4junction16.co.uk. The website provided additional information and set out how residents could contact the project team and provide feedback on the application.
- 4.4.6 The application pack has evolved taking into consideration feedback received during the community consultation event, specifically those relating to the following matters:
- Access and traffic related matters;
 - Construction traffic;
 - Woodlands, trees and landscape planting;
 - Biodiversity enhancement and ecological buffers;
 - Flood Risk and drainage;
 - Lighting; and

- Noise associated with the construction works.

- 4.4.7 Further details on the above comments and how these have been addressed as part of the Proposed Development are included in the Statement of Community Involvement (SCI) submitted in support of the Planning Application.

Technical Consultation

- 4.4.8 Technical consultation directly related to the production of this ES has included:

- Screening opinion request;
- Baseline data collection;
- A scoping exercise of effects between specialists; and
- Ongoing technical liaison.

- 4.4.9 As explained in **Chapter 1: Introduction** and **Chapter 2: EIA Approach and Methodology**, a screening opinion request was sought on June 2023 in accordance with Regulation 6 (1) of the EIA Regulations for the following project description.

“Outline Application with reserved matters for the development of a Motorway Rest Area (MRA) to provide 255 Car Parking Spaces, 62 Heavy Goods Vehicle (HGV) parking, additional vehicle parking, amenity Building, fuelling station and associated landscaping and works at Land at junction 16, M4 Motorway, Swindon.”

- 4.4.10 A screening response was received on August 2023, obtaining a negative screening opinion i.e., EIA is not required. However, this ES aims to demonstrate the sustainable approach of the project and its environmental mitigation measures. The **Screening Opinion Decision Notice**, shown in **Appendix 1.2**, described the WC feedback, which was decisive during the iterative design process.
- 4.4.11 Full details of technical consultations are provided in each technical chapter and within the topic specific consultation trackers as appropriate.

4.5 SCHEME DEVELOPMENT

- 4.5.1 In accordance with Schedule 4, Paragraph 2 of the EIA Regulations (HMSO, 2017) the ES is required to include an outline of the main alternatives considered in developing the proposal and the reasons for the choice to be taken forward. This section, therefore, provides a review of those alternatives that have been studied, either as part of the local plan development process or at project level.

Do Nothing

- 4.5.2 In addition, in compliance with Schedule 4, Paragraph 3 of the EIA Regulations, a description of the likely future baseline without implementation of the proposed development is provided within individual technical chapters included as part of this ES. For the purposes of this chapter, this scenario is defined as ‘Do nothing’ scenario.

- 4.5.3 If no development was to be constructed, the land and its characteristics are likely to remain the same.

4.5.4 However, given the planning policy position outlined above (Section 4.2) the ‘do nothing’ scenario is not considered to be a ‘reasonable alternative’, given that it will fail to meet the NPPF and the DfT Circular 01/202 recommendations and requirements.

Alternative Sites

4.5.5 The vision for the site has been based on careful policy research at national, regional and local levels, and consideration of both existing and emerging provisions. The vision is also regarded as playing a significant part in contributing to the objectives of key regeneration strategies and initiatives operating at the local, sub-regional and regional level.

4.5.6 As stated previously, the Proposed Development has been selected according to the planning context and the sequential test produced in order to find the perfect parcel of land that allow HGVs, bus and coach drivers and motorists to rest and, therefore, meet the requirements and recommendations.

Site Constraints and Opportunities

4.5.7 Whilst the development site is identified by the Applicant as being the preferred location to accommodate development of this nature, during preparation of the proposal, a series of development scenarios have evolved for the site that seek to accommodate both the aspirations of the Applicant, WC, consultees and the general public.

4.5.8 A number of technical studies have been undertaken whose results have been used to refine the iterative masterplan into a position where it could be reviewed and consulted upon. These constraints and opportunities are shown in Figure 4.2, which in addition to the public consultation work have influenced the emerging design layout and the key influences are summarised below:

4.5.9 Constraints

- Low managed hedgerows to some boundaries provide little visual containment of the site;
- Existing access to the site; and
- Noise from motorway and B4005.

4.5.10 Opportunities

- Relatively flat site with no existing landscape features of value (other than planted boundaries);
- Existing lighting associated with the M4 provides some night time illumination;
- Well connected to the existing Industrial park and different uses (retail, hotels, business’ etc); and
- No residential.

4.5.11 Figure 4.3 shows a further site masterplan that was developed in response to the constraints/concerns identified above and which shows:

- Site access and topography;
- Potential locations of acoustic screening;

- Ponds and waterbodies; and
- Existing vegetation and Tree Preservation Orders.

Figure 4.2. Conceptual Constraints and Opportunities Plan

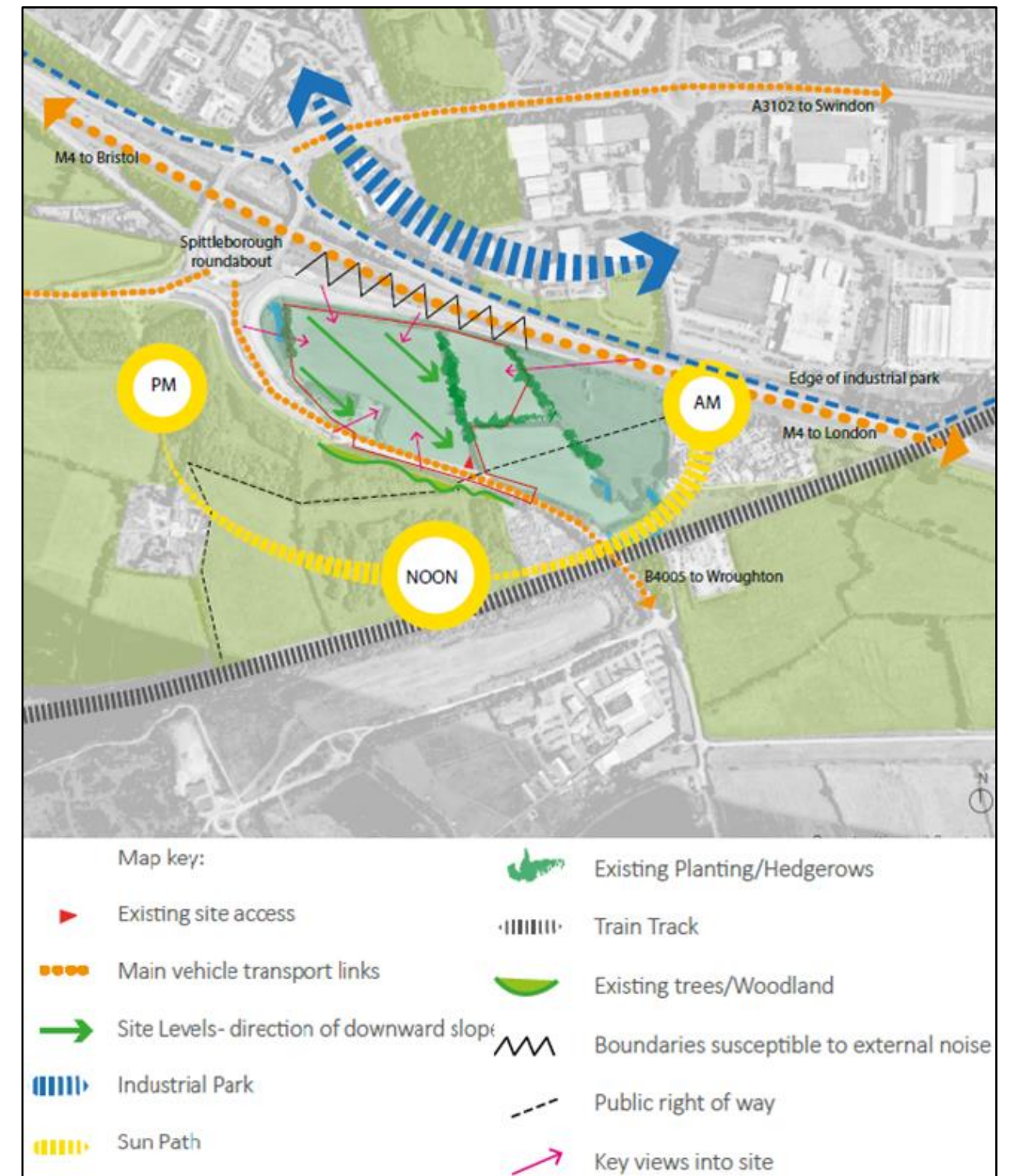
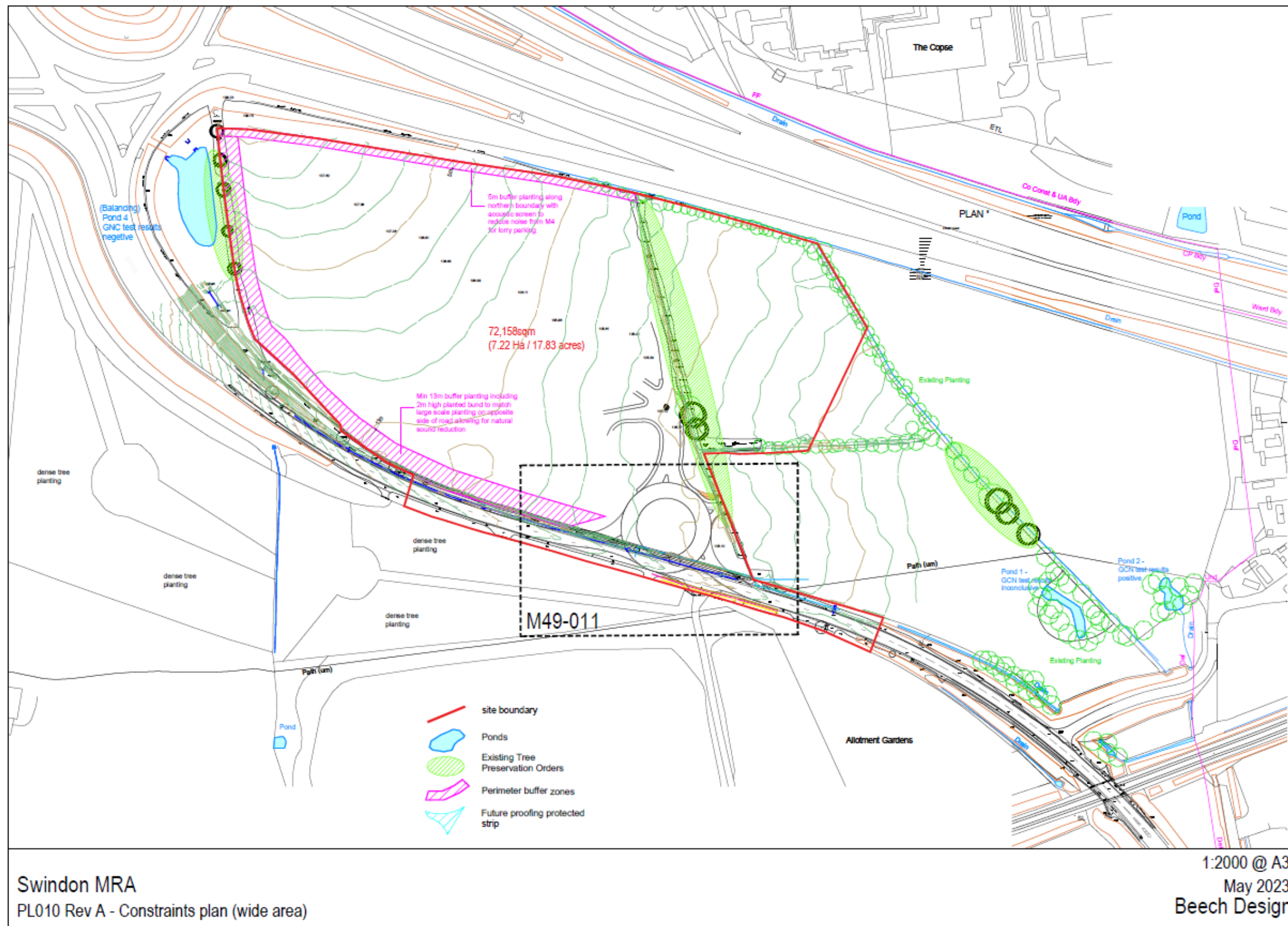


Figure 4.3. Further Developed Site Constraints Plan (red line updated since)



Design Evolution

- 4.5.12 A number of different layouts have been considered to respond to changes in the development brief during design development. Initially explored as an integrated Motorway Rest Area, it was then conceived as a truck stop. Then scheme shifted its focus to a hybrid truck and EV offer and finally, through careful consideration of local and regional factors, it is finally being proposed as a future proofed MRA including 50 No. high powered EV points and the potential to provide 100% EV provision for all vehicles. This evolution has also proposed a change in description and in number of car spaces and HGVs spaces.
- 4.5.13 All options explored the most efficient location for the new buildings on the site, recognising that these will be the most prominent features. The location of the amenity building was largely static as it would result in the least visual impact for views into the site, while being visual enough at the entrance points to aid in wayfinding etc for the users of the site.
- 4.5.14 The optimum location for the amenity building and the PFS shop, would be to the east of the site. This would allow for parking to the west of the building and servicing to the east and allow for entrance and exit points to its south and fuel filling areas to the north, adjacent to the M4.
- 4.5.15 As mentioned, a number of layout options were considered relating to the different proposed uses for the site, with the advantages and disadvantages of each interrogated. Throughout this process the visual impact of the scheme on the surrounding landscape was continually assessed.
- 4.5.16 A series of 4 evolving design options is provided in Figure 4.4.

Figure 4.4. Options showing the Evolution of the Design



Chapter 5: Traffic and Transport
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5.0 TRAFFIC AND TRANSPORT

5.1 INTRODUCTION

- 5.1.1 This ES chapter assesses the transportation effects of the Proposed Development and whether these effects are significant in EIA terms.
- 5.1.2 This chapter should be read in conjunction with the **Transport Assessment (TA)** provided as a supporting document of this planning application.
- 5.1.3 The scope of road network to be assessed has been agreed in principle by all three highway authorities, namely Swindon Borough Council (SBC), Wiltshire Council (WC) and National Highways (NH). The junctions that require assessment are the site's access junction with the B4005 and Junction 16 of the M4.
- 5.1.4 The site is located on the outskirts of Swindon, approximately 5 kilometres to the southwest of the town centre.
- 5.1.5 The site is bound to the north by the M4 Motorway, to the south by the B4005, to the west Junction 16 of the M4 and to the east by undeveloped land. A more detailed description can be found in **Chapter 3: Description of Development**.
- 5.1.6 This ES chapter has been prepared by Eddisons, and authored by Mark Cleary who is an Associate Director at Eddisons, with over 15 years' relevant experience in the private development sector advising on a range of large developments and planning applications.

5.2 METHODOLOGY AND SCOPE

Policy Background

National Planning Policy Framework¹

- 5.2.1 The latest version of the National Planning Policy Framework was updated in September 2023. The presumption in favour of sustainable development is a central theme running through the Framework, which states at paragraph 104 that *'transport issues should be considered from the earliest stages of plan-making and development proposals, so that:*
 - a) *the potential impacts of development on transport networks can be addressed;*
 - b) *opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;*
 - c) *opportunities to promote walking, cycling and public transport use are identified and pursued;*

- d) *the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and*
- e) *patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.'*

5.2.2 Paragraph 105 states that *'The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes.'*

5.2.3 As will be demonstrated within the **TA**, the Proposed Development accords with the policy test contained within paragraph 110 of the Framework which states that:

'In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

- a) *appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;*
- b) *safe and suitable access to the site can be achieved for all users; and*
- c) *any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.'*

5.2.4 Paragraph 111 concludes that:

'Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.'

5.2.5 Paragraph 112 continues by advising:

- a) *'Within this context, applications for development should:*
- b) *give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;*
- c) *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*
- d) *create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
- e) *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*
- f) *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.'*

¹ MHCLG (2023). National Planning Policy Framework. Ministry of Housing Communities and Local Government.

5.2.6 Paragraph 113 advises that:

‘All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed.’

5.2.7 The provision of a Travel Plan as part of the development is in accordance with the guidance.

5.2.8 The Proposed Development accords with the aims and objectives of the Framework.

Planning Practice Guidance

5.2.9 The Government has produced the National Planning Practice Guidance to supplement the NPPF. Within the guidance, there is specific section clarifying the over-arching principles on Travel Plans, Transport Assessments and Transport Statements. There are also sections advising further on each of the three documents discussed.

5.2.10 The guidance advises that in determining whether a TA or Statement will be needed for a Proposed Development, local planning authorities should take into account a number of considerations. It is considered that the size and nature of this development requires a full TA.

5.2.11 It also clarifies the process for establishing a scope for the assessment, and what the document should contain. The guidance has been considered in the preparation of the TA and the scope agreed with the three highway authorities.

5.2.12 The guidance on Travel Plans reinforces the benefits a Travel Plan, the scope of the document, and need for monitoring to continue the strategy into the future.

Wiltshire Core Strategy²

5.2.13 The Wiltshire Core Strategy (Adopted January 2015) sets out the spatial vision, key objectives and overall principles for development in the County for a period up to 2026. The aim of the Core Strategy is to deliver new jobs and homes, whilst providing high quality design, infrastructure, environmental and community benefits.

5.2.14 The pertinent policies to consider with regards to highways and transportation are Policies CP60, CP61, CP62, CP63, CP64 and CP65.

5.2.15 The Proposed Development and associated infrastructure will provide a development that is accessible by non-car modes and the implementation of a Travel Plan will further maximise the use of alternative modes of travel to the private car for staff at the development. Given the nature of the proposals, the development will also promote sustainable travel for existing road users by meeting the growing demand for electric vehicle charging stations.

5.2.16 The location of the site is ideal for a Motorway Rest Area, with its close proximity to the M4, and it has potential to provide a high quality of design, as well as assisting in meeting the growing demands for heavy goods vehicles (HGV) parking and electric vehicle charging stations.

Key Legislation

5.2.17 There is no legislation that is directly relevant to the scope of this chapter, although other disciplines informed from outputs of the transportation work may be subject to such legislation.

EIA Screening and Scoping Assessment Stage

5.2.18 As previously stated, the scope of road network to be assessed has been agreed in principle by all three highway authorities, namely SBC, WC and NH. Scoping discussions have also confirmed that the proposed assessment methodology is appropriate. Further details on scoping discussions are provided in the **TA**.

5.2.19 An EIA screening opinion was sought from WC and a subsequent screening opinion was received **Appendix 1.2: Screening Opinion Decision Notice**.

5.2.20 In terms of Transport and Access rationale, the Council’s opinion was that an Environmental Impact Assessment is not required for the following reasons:

- *‘The project unlikely result in significant impact upon this existing public rights of way.’*
- *‘The development will take access via a roundabout to be constructed on the B4005 road, and it is then only a short distance to the large traffic signalled M4 J16 roundabout junction. The majority of movements will distribute in this direction to and from the M4 and not via other local network roads. Therefore, the project would unlikely result in significant effect under the Regulations.’*

Assessment Methodology

Guidelines for the Environmental Assessment of Road Traffic³

5.2.21 The Institute of Environmental Management and Assessment (IEMA) guidelines ‘Environmental Assessment of Traffic and Movement’ was published in July 2023. The approach for this assessment has been undertaken in accordance with these guidelines.

5.2.22 As advised within the document *‘The purpose of these updated and replacement Guidelines remains unchanged from the 1993 Guidelines, i.e. to provide practitioners with good practice advice on how to carry out the assessment of traffic and movement of people as part of a statutory EIA or non-statutory environmental assessment.’*

5.2.23 The IEMA guidelines suggest two broad rules-of-thumb as criteria to assist in delimiting the scale and extent of the environmental assessment:

- Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
- Include highway links of high sensitivity where traffic flows have increased by 10% or more.

5.2.24 However, it adds that *‘It should be noted that the Rule 1 and Rule 2 ‘criteria’ process may not be appropriate for some impacts, and it is generally accepted by regulators and practitioners that it should not be applied to assessments of air quality, noise, road safety and driver delay. For these*

² Wiltshire Council. (2015). Wiltshire Core Strategy.

³ IEMA. The Institute of Environmental Management and Assessment. Environmental Assessment of Traffic and Movement. July 2023.

- impacts, a separate study area and assessment criteria should be agreed with the relevant stakeholders.'*
- 5.2.25 The IEMA Guidelines form the basis for the assessment of the effects of the Proposed Development on traffic and movement, including the consideration of the following potential impacts:
- Severance of communities;
 - Road vehicle driver and passenger delay;
 - Non-motorised user delay;
 - Non-motorised amenity;
 - Fear and intimidation on and by road users;
 - Road user and pedestrian safety; and
 - Hazardous/large loads.
- 5.2.26 The potential groups and special interests that may be affected by the Proposed Development have been considered and the following list of 'receptors' has been identified, taking account of Rule 2 above:
- Sensitive groups including children, elderly and disabled;
 - Accident 'black spots';
 - Vehicle Drivers - Highway corridors / junctions identified from scoping discussions;
 - People walking;
 - People cycling; and
 - Schools/Hospitals.
- 5.2.27 The Environmental Effects from the Proposed Development have been assessed in the following terms:
- Beneficial - Meaning that they produce environmental benefits in transportation terms, i.e. where overall traffic flows or percentage HGV decrease, or there are improved facilities for pedestrians, cyclists or public transport users;
 - Negligible - Meaning that changes are too small to meaningfully measure;
 - Adverse - Meaning that they produce environmental disbenefits in transportation terms, i.e. where overall traffic flows or percentage HGV increase, or there are reductions in facilities for pedestrians, cyclists or public transport users;
- 5.2.28 Beneficial and adverse effects are further characterised as:
- Minor - highly localised changes in traffic flows/patterns of between 10% and 30%;
 - Moderate – Limited change where, changes in traffic flows/patterns are between 30% and 60%; and
 - Major – Considerable change, where changes in traffic flows/patterns are greater than 60%.

- 5.2.29 The assessment methodology can be outlined in the following sections on identifying and applying receptor sensitivity, effect magnitude and how these combine to establish the significance of effects.

Receptor Sensitivity

- 5.2.30 The sensitivity of receptors is described in Table 5.1.

Table 5.1. Receptor Sensitivity

Receptor value / sensitivity	Receptor type
High	Sensitive groups, including children, elderly and disabled. Sensitive locations, e.g. hospitals and schools Accident 'black-spots'
Medium	People walking People cycling
Low	Vehicle drivers
Negligible	n/a

Impact Magnitude

- 5.2.31 The degree of magnitude of impacts that the Proposed Development would have upon the resource/receptor is considered within the range of high, medium, low and negligible. Consideration is given to scale, duration of impact/effect (e.g., for construction, short-term for 1-2 years, medium-term for 3-5 years, long-term for 5 years and greater, and permanent, dependent upon project timeframes) and extent of Proposed Development with reference to the definitions in Table 5.2.

Table 5.2. Magnitude of Impact

Magnitude	Potential Impact				
	Severance	Driver Delay	Pedestrian Delay and Non-motorised User Amenity	Fear and Intimidation	Road Safety
High	Change in highway link traffic flow of over 60%	Substantial increase in delay	Change in highway link traffic flow of over 60%	Two step changes in level	Personal injury accident rate changed and above national average
Medium	Change in highway link traffic flow of 30% to less than 60%	Moderate increase in delay	Change in highway link traffic flow of 30% to less than 60%	One step change in level, but with • >400 veh increase in average 18hr AV two-way all vehicle flow; and/or • >500 HV increase in total 18hr HV flow	Personal injury accident rate changed but below national average
Low	Change in highway link traffic flow of 10% to less than 30%	Slight increase in delay	Change in highway link traffic flow of 10% to less than 30%	One step change in level, with • <400 veh increase in average 18hr AV two-way all vehicle flow; and/or • <500 HV increase in total 18hr HV flow Change in highway link traffic flow of 10% to less than 30%	Slight change to personal injury accident rate
Negligible	Change in highway link traffic flow of less than 10%	No change in delay	Change in highway link traffic flow of less than 10%	No change in step changes	No change to personal injury accident rate

Effect Significance

5.2.32 The assessment of effects is based upon the assessments of magnitude of impacts and sensitivity of the resource/receptor to come to a transparent conclusion of how important or significant this effect is. This is shown in Table 5.3, although professional judgement can also be used to adjust the significance of an effect.

Table 5.3. Significance of Effect

Receptor Sensitivity	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

5.2.33 All effects moderate and major are considered significant.

5.2.34 To assess the likely significant effects of the Proposed Development in transportation terms, the following scale set out in Table 5.4 has been used. The significance scale is derived from the interaction of receptor sensitivity and magnitude of change of effect but can be adjusted based on professional judgement.

Table 5.4. Significance Scale

Significance Scale	Description
Major beneficial	Change that would delay the need for planned modification to off-site infrastructure.
Moderate beneficial	Increased perception of changing conditions that may delay the need for planned modifications to off-site infrastructure.
Minor beneficial	Perception of changing conditions e.g. reduction in delay
Negligible	No perceptible change
Minor adverse	Perception of changing conditions e.g. increase in delay
Moderate adverse	Increased perception of changing conditions that may require modifications to off-site infrastructure
Major adverse	Change requiring modifications to off-site infrastructure

Limitations of the Assessment

5.2.35 There are a number of limitations and constraints, which include:

- The data used in this assessment is derived from a combination of Highways England WebTRIS data <https://webtris.highwaysengland.co.uk/> for the strategic road network and via 2023 reference case flows established from National Highways strategic traffic model for Junction 16. The data collection and collation has been undertaken by National Highways and third party specialists. This follows standard industry practice and it is assumed that these data sources are accurate;

- The committed development traffic flows used within this assessment have been obtained from the TA's undertaken by 3rd party specialists. This follows standard industry practice and it is assumed that these data sources are accurate;
- Baseline conditions have been established from a variety of sources which are the most up-to-date data available at the time. However, due to the dynamic nature of certain aspects of the environment and the lengthy time for the implementation of the scheme, conditions may change during the construction and operation of the Proposed Development;
- The Proposed Development traffic flows used within this assessment have been obtained based on trip rates at other, similar developments. It is assumed that these will be representative of the traffic flows that will occur at the application site and this methodology has been agreed with the three highway authorities;
- The Proposed Site Access will be subject to a Stage 1 / 2 Road Safety Audit once the geometric principles of the access are agreed with the three highway authorities; and
- It is assumed that all the principal existing land uses and transport infrastructure in the vicinity of the application site, other than those specifically identified, remain substantially unaltered.

5.3 BASELINE ENVIRONMENT

Existing baseline

- 5.3.1 The site is located on the outskirts of Swindon, approximately 5 kilometres to the southwest of the town centre.
- 5.3.2 The site is bound to the north by the M4 Motorway, to the south by the B4005, to the west Junction 16 of the M4 and to the east by undeveloped land.
- 5.3.3 The site is currently undeveloped and has no formal vehicular access to the site.
- 5.3.4 Within the vicinity of the site are the following land uses;
- Lydiard Fields Business Park is located to the north of the site, north of Junction 16;
 - Hey Lane Caravan Park, Studly Grange Garden Centre and Allotments are located to the east and southeast of the site; and
 - North Wiltshire Crematorium, Spittleborough Farm and Autoworks, and a Solar Farm are located to the southwest and west of the site.
- 5.3.5 There are no schools or hospitals in the vicinity of the site which would require more detailed consideration in terms of receptor sensitivity.

Local Highway Network

- 5.3.6 To the northwest of the site, the B4005 provides direct access to the M4 motorway at Junction 16 via a five-arm signalised roundabout. The B4005 is subject to a 40mph speed limit where it passes the site and is street lit on the approach to Junction 16 only.

- 5.3.7 Junction 16 links the M4 to the nearby towns of Swindon (to the north of the site via the A3102) and to Royal Wooten Bassett (to the southwest via the A3102 Swindon Road).
- 5.3.8 A small layby is located on the B4005 site frontage. This layby will be retained as part of the Proposed Development.

Baseline Traffic Flows

- 5.3.9 Table 5.5 below, provides a summary of the 24-hour AADT 2019 and 2027 baseline flows at the key links in the vicinity of the site where the development site will have a potential impact. For the purposes of this chapter, the turning count data for the study area detailed above have been used to derive the two-way link counts which can then be used to assess the impacts.

Table 5.5. 24hr AADT 2021 and 2025 Baseline Flows (Two-Way AADT Link Flows)

Link Name	2019 Base Flows		2027 Opening Year (Without Development) Flows	
	LGV	HGV	LGV	HGV
B4005 (E of Site Access)	6979	901	17634	953
Site Access	0	0	0	0
B4005 (W of Site Access)	6979	901	17634	953
M4 Eastbound Off-slip	7593	806	8029	853
M4 Eastbound On-Slip	8426	1218	8911	1289
M4 Westbound Off-Slip	8141	1206	8609	1275
M4 Westbound On-slip	7024	994	7428	1051
Swindon Road	27204	599	30109	633
A3102 Franklands	40689	1317	46353	1393
A3102 (N)	40769	1294	46103	1369
M4 Mainline (East of J16)	55176	10309	58350	10902
M4 Mainline (West of J16)	50882	12637	53809	13364

Highway Safety

- 5.3.10 Stats19 accident data has been obtained from NH for the most recent 5 year data period. The accident data covers Junction 16 of the M4, along with the M4 mainline and its associated slip roads.
- 5.3.11 Stats19 data is collected by the police and includes road traffic crashes occurring on British roads where someone is injured. This data is approved by the National Statistics Authority and reported on by the Department for Transport each year. This site uses data obtained directly from official sources but compiled in an easy to use format showing each incident on a map. Incidents are plotted to within 10 metres of their location, and as such, can sometimes appear to be off the carriageway.
- 5.3.12 A summary of the accident statistics at the junctions under consideration is provided below. The full accident data is contained within the **TA**.
M4 mainline and slip roads.
- 5.3.13 Accident statistics confirm that numerous accidents have occurred along the M4 mainline in the vicinity of the development site, with a minimal number of accidents occurring on the associated slip-roads. The Proposed Development is not predicted to generate any additional traffic, rather its purpose is to provide safety and welfare opportunities for those already travelling on the motorway network. As such, the provision of the Proposed Development will assist in reducing accidents on the motorway network. It is therefore considered that the proposals will have a positive impact on the safety record of the strategic highway network.
B4005 in the vicinity of the Proposed Site Access.
- 5.3.14 The data supplied by NH shows that no accidents occurred along the B4005 within the 5-year study period.
M4 junction 16.
- 5.3.15 The data provided confirms that eleven accidents have occurred at the M4 Junction 16 roundabout within the 5 year study period. Ten of these accidents were classed as slight in severity and one was classified serious. The causality assessment of these accidents is detailed below in Table 5.6.

Table 5.6. Accident Data Summary - M4 Junction 16

Date	Severity	Light Conditions	Weather	Road Conditions	Manoeuvre
30/08/2019	Slight	Daylight	Unknown	Dry	Both vehicles moved off at the lights, V1 (Van) collided nearside of V2 and then drove off.
25/01/2020	Slight	Darkness, Streetlights lit	Fine, without high winds	Dry	Vehicle slowed down for traffic lights, vehicle behind collided into the rear.

26/04/2019	Serious	Daylight	Raining, With high winds	Wet or Damp	Vehicle moved off at the lights in the wrong lane, resulting in a collision with another vehicle.
22/09/2021	Slight	Daylight	Fine, without high winds	Dry	Vehicle slowed down for traffic lights, vehicle behind failed to notice and collided into the rear.
27/03/2020	Slight	Daylight	Fine, without high winds	Dry	Vehicle runs a red light and collides on the offside of another vehicle.
15/09/2021	Slight	Daylight	Fine, without high winds	Dry	Vehicle disobeyed red traffic light causing another vehicle to collide into the front nearside.
15/09/2021	Slight	Darkness, Streetlights lit	Fine, without high winds	Dry	Vehicle has entered roundabout on green light when another vehicle has collided front causing the vehicle to spin and impact crash barrier.
05/05/2017	Slight	Darkness, Streetlights lit	Fine, without high winds	Dry	Vehicle (V1) cut across front of another vehicle to leave roundabout, hitting the vehicle (V2). V2 was then pushed into another vehicle, before leaving road across island and back into C/Way, hitting another vehicle.
10/12/2018	Slight	Darkness, Streetlights lit	Fine, without high winds	Dry	Motorcyclist looked at the wrong traffic light and thought they had the green light and moved off,

					before colliding into another vehicle.
1402/2018	Slight	Darkness, Streetlights Unlit	Raining, Without high winds	Wet or Damp	Vehicle crossed junction where traffic lights and streetlights were not functioning before colliding with another vehicle mid junction.
14/06/2020	Slight	Daylight	Fine, without high winds	Dry	Vehicle goes through traffic lights to beat the green light and collides into the rear of a pedal cycle.

5.3.16 Considering the volume of traffic at Junction 16 and the severity of the accidents that have occurred, Junction 16 does not have an unduly poor safety record. A review of the causal factors reveal that the majority of the accidents can be attributed to driver error. It should also be noted that the signal arrangement to the south of Junction 16 is relatively new, with construction completed on the highway works in circa 2019. As such, there would be an expected bedding down period where accidents are likely to increase due to drivers not being familiar with the new junction arrangement. This could account for some of accidents which have occurred at the junction post 2019.

5.3.17 Overall, the accidents statistics do not point to any particular highway safety issues and there is no reason why this would change as a result of the Proposed Development.

Walking Links

5.3.18 The pedestrian infrastructure in the vicinity of the site is limited to a footway on the southern side of Swindon Road. This footway links the site to the existing pedestrian crossing facilities across the B4005 arm of Junction 16.

5.3.19 An existing controlled pedestrian crossing is provided on the B4005 at Junction 16.

5.3.20 It should also be noted that there are no Public Right of Way on the site and no anticipated impact on any surrounding Public Rights of Way.

Cycle Links

5.3.21 An alternative mode of travel to the site could be achieved by bicycle. Cycle access will be available via the proposed vehicular access from B4005 and via the new 3.0m wide shared cycleway / footway linking into the site.

5.3.22 There are currently no dedicated cycle facilities in the immediate area, however, the surrounding highway network is relatively flat and therefore conducive to cycling.

5.3.23 New advice contained within the Highway Code, which was updated on 29th January 2022, will improve the safety of vulnerable road users including cyclists, pedestrians, and horse-riders. Most of the new advice relates to where cyclists should position themselves within the lane in various traffic

conditions and motorists being required to give cyclists priority in slow moving traffic and locations where there is insufficient room for vehicles to overtake cyclists safely, allowing 1.5-metres for cyclists when overtaking them.

5.3.24 A distance of 5 kilometres is generally accepted as a distance where cycling has the potential to replace short car journeys. This distance equates to a journey of around 25 minutes based on a leisurely cycle speed of 12 kilometres per hour and would encompass parts of encompass Royal Wootton Bassett, Common Platt, Hook, Lydiard Millicent and Swindon.

Public Transport Links

5.3.25 The nearest bus stop to the site is located approximately 550 metres from the centre of site, along the A3102 Swindon Road, immediately to the west of the development site. A summary of these services is provided in Table 5.7.

Table 5.7. Existing Bus Services Operating in the Vicinity of the Site

Service No	Route	Monday to Friday (buses per hour)			Saturday			Sunday
		Pre 08:00	08:00-17:00	Post 17:00	Pre 08:00	08:00-17:00	Post 17:00	
55	Chippenham - Swindon	9 services	10 minutes	18 services	5 services	20 minutes	10 services	30 minutes
99	Chippenham - Malmesbury - Wootton Bassett - Swindon	2 services	60 minutes	3 services	-	60 minutes	2 services	-

5.3.26 As can be seen from Table 5.7, the nearest bus stops to the site provides numerous services throughout the day to destinations such as Chippenham and Lyneham.

5.3.27 It is noted that the above services operate from around 4:45am to around 23:45pm, making travel by public transport a real alternative to travelling by car for staff commuting trips.

The nearest train station located to the site is Swindon station. This train station can be accessed by a 15-minute bus journey on service 55 or a 26-minute cycle. This train station is managed by Great Western Railway and has 4 platforms, offering 13 services per hour to destinations such as London and Swansea.

Future baseline

5.3.28 For the purpose of this assessment, a future baseline horizon of 2027 has been considered, representing the forecast opening year, with construction commencing circa 2025.

- 5.3.29 In order to factor the 2019 base flows to the future assessment years of 2027, a NTEM adjusted National Road Traffic Model growth factor was used. This approach has been accepted in principle by the three highway authorities and further details are provided in the **TA**.
- 5.3.30 The 2027 future baseline traffic flows are detailed in Table 5.4, earlier in this chapter.
- 5.3.31 It is not anticipated that there will be any changes of sensitivity between the current baseline and future baseline when considering the Walking Links, Cycle Links, Public Transport Links and Highways Safety. The baseline receptors and their corresponding sensitivity are, therefore, considered as follows:
- Severance of communities – **Medium**;
 - Road vehicle driver and passenger delay – **Low**;
 - Non-motorised user delay – **Medium**;
 - Non-motorised amenity – **Medium**;
 - Fear and intimidation on and by road users – **Medium**;
 - Road user and pedestrian safety – **Medium**; and
 - Hazardous/large loads – **Medium**.

5.4 MITIGATION WITHIN THE SUBMITTED DESIGN

Construction

- 5.4.1 Management of construction effects will form part of a comprehensive and auditable Construction Traffic Management Plan (CTMP). The CTMP will include control measures – including traffic management measures - to protect the environment, amenity and safety of local residents, businesses, and the general public in the vicinity of the Proposed Development.
- 5.4.2 As part of a CTMP, a construction vehicle routing regime for access to the construction site will be identified and agreed with the local and strategic highway authorities, to ensure that drivers of construction related vehicles do not use inappropriate routes which are unsuitable due to their width, alignment or character. As previously discussed, it is anticipated that construction traffic will access the site from the M4 and the short stretch of B4005, therefore avoiding impacts on local roads. The regime will ensure that construction vehicles avoid residential and other sensitive areas and use the strategic road network wherever possible.

Design

- 5.4.3 The site will be served by a new roundabout off the B4005. The new formal standard roundabout junction will meet with current design guidance and ensure that the speeds of vehicles are controlled along this section of B4005. The design can also accommodate the forecast traffic flows both on B4005 and to and from the Proposed Development. Further details are provided in the **TA**.

5.5 LIKELY SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE SCHEME

Construction Phase

- 5.5.1 Construction activities will include the site preparation and clearance, construction of a new amenity building, petrol filling station, parking facilities for all classes of vehicles, internal access roads and service areas, landscape proposals with amenity areas, associated infrastructure and ancillary works.
- 5.5.2 Construction of the Proposed Development will entail deliveries of materials and products that will be transported by HGVs. In addition, there will be on-site operation of construction equipment and plant.
- 5.5.3 The timing and generation of construction traffic is not yet known and will depend upon the contractors associated with the build out of the development, however, an indicative construction programme has been set from 2025 to 2027, with the first full year of operation of 2027. During this time, there will be a mix of construction traffic as the development is built out. Construction traffic will include the movements of workers associated with the construction of infrastructure and individual plots along with the movement of material in the form of importing or exporting material. Construction vehicles will be routed to access the site from the B4005 via the M4 which will limit the impact on the local road network.
- 5.5.4 It is expected that the majority of construction workers would originate within the local residential areas and will all approach the site from Swindon, Royal Wooten Bassett or via the M4. The HGV traffic generated during the construction phase of the development is anticipated to originate predominantly from the wider strategic network, travelling to the site via the M4, avoiding the local road network.
- 5.5.5 Considering the nature of the site and the provision of up to 63 HGV parking spaces, the overall HGV traffic volumes are anticipated to be the highest on completion. Therefore, the Operational Phase assessments assess the worst case scenario of HGV movements on the highway network.
- 5.5.6 Given construction traffic will be instructed to avoid inappropriate routes, the route of the M4, Junction 16 and the B4005 will represent the most likely route into the site from the highway network. This is an already well trafficked route and is wholly suitable for HGV routing.
- 5.5.7 Increases in traffic along this route as a result of the construction phase will be substantially lower than those associated with the operational phase of the development and minimal compared to base levels of traffic. The construction phase is therefore considered to have a **negligible** magnitude of impact on vehicular severance and driver delay. The construction period is relatively short-term and temporary in its effects.
- 5.5.8 In terms of pedestrian severance, non-motorised user amenity and delay, and fear and intimidation, the limited levels of construction traffic combined with the absence of footways along certain sections and general low pedestrian demand in the vicinity of the site will result in the effects on pedestrians being **negligible** magnitude of impact.

5.5.9 The magnitude of impact for the construction phase with respect to Severance, Driver Delay, Non-motorised user Amenity and Delay, Fear and Intimidation, and Road Safety and Hazardous Loads are therefore considered to be **negligible**.

5.5.10 It is not anticipated that there will be any changes to the baseline receptor sensitivities during the construction phase and, therefore, the significance of effects are considered in the following table:

Table 5.8. Summary of Effect of Construction Phase

Receptor	Receptor Sensitivity / Magnitude of Impact	Level of Significance	Duration of Effect
Severance	Medium / Negligible	Negligible	Short Term
Driver Delay	Low / Negligible	Negligible	Short Term
Non-motorised user Amenity and Delay	Medium / Negligible	Negligible	Short Term
Fear and Intimidation	Medium / Negligible	Negligible	Short Term
Accidents and Safety	Medium / Negligible	Negligible	Short Term
Hazardous Loads	Medium / Negligible	Negligible	Short Term

Operational Phase

5.5.11 The operation of the development refers to the period when all buildings and facilities are fully operational, representing the greatest effect on the road network.

5.5.12 As noted in the traffic impact section within the TA sets out the detailed methodology for assessment of traffic effects. In summary, the assessment considers the following scenarios:

- 2019 Base Year;
- 2027 Opening Year; and
- 2033 Future Year (10 years after the date of the planning application, as agreed with NH - TA Assessment only).

5.5.13 Traffic growth has been applied using the recommended current practice for factoring vehicular trips derived from the latest TEMPRO (7.2) datasets and adjusted using the National Transport Model, taking into account committed development.

5.5.14 Motorway Rest Areas are typically not considered to be a trip generator but primarily an attractor of a proportion of existing passing traffic. The proposed trip generation has been derived through the use of observed trip rates at a comparable services to derive the number of vehicle movements into and out of the motorway rest area. This is addressed in detail in the TA and has been agreed with the three highway authorities.

5.5.15 The predicted traffic movements are summarised below in Table 5.9.

Table 5.9. 24hr AADT Impact Summary (Two-Way AADT Link Flows)

Link Name	2027 Base (Without Development) Flows (AADT Two-way Link)		2027 Opening Year (With Development) Flows (AADT)		Change in Traffic Flow		Percentage Change (from Predicted Baseline – 2027)	
	LGV	HGV	LGV	HGV	LGV	HGV	LGV	HGV
B4005 (E of Site Access)	17634	953	17815	1005	+181	+52	1.0%	5.5%
Site Access	0	0	5190	1639	+5190	+1639	100%	100%
B4005 (W of Site Access)	17634	953	22643	2539	+5009	+1586	28.4%	166%
M4 Eastbound Off-slip	8029	853	9183	1305	+1154	+452	14.4%	52.9%
M4 Eastbound On-Slip	8911	1289	10162	1660	+1251	+371	14.0%	28.7%
M4 Westbound Off-Slip	8609	1275	9869	1585	+1260	+310	14.6%	24.3%
M4 Westbound On-slip	7428	1051	8590	1442	+1162	+391	15.6%	37.2%
Swindon Road	30109	633	30196	660	+87	+27	0.3%	4.3%
A3102 Franklands	46353	1393	46449	1428	+96	+35	0.2%	2.5%
A3102 (N)	46103	1369	46199	1403	+96	+34	0.2%	2.4%
M4 Mainline (East of J16)	58350	10902	58350	10902	0	0	0%	0%
M4 Mainline (West of J16)	53809	13364	53809	13364	0	0	0%	0%

5.5.16 Table 5.9 demonstrates that excluding the site access road, the local road network is predicted to experience a maximum increase in light vehicle traffic of 28.4% and an increase in HGV traffic, along a short stretch of the B4005 (between Junction 16 and the proposed site access), of 166%. Elsewhere, on other local road links, the maximum increase in light vehicle traffic is 1.0% and 5.5% in HGVs respectively. The strategic road network (M4 Slip Roads) is predicted to experience a maximum increase of 15.6% in light vehicle traffic and a 52.9% in HGV traffic in the 2027 opening year scenario.

Severance

- 5.5.17 Severance is defined in the IEMA Guidelines as a term used to describe a complex series of factors that separate people from places and other people. Although generally applied to people on foot, severance can also apply to all forms of transport.
- 5.5.18 The fundamental point associated with the Proposed Development is traffic levels are not predicted to significantly rise on the local road network as a result of the development, except on the M4 slip roads, on and off the motorway, on the circulatory carriageway at Junction 16 and along a short stretch of B4005 (between Junction 16 and the Site Access). These links have very low pedestrian activity and limited footway provision. The baseline sensitivity of the severance receptor has been identified as **medium** and this sensitivity will continue in the operational phase of the development as the existing controlled pedestrian crossing on the B4005 will continue to provide priority to pedestrians crossing the B4005.
- 5.5.19 It should also be noted that a very low level of pedestrian activity currently occurs at Junction 16 and it is not expected that this will significantly increase as a result of the Proposed Development. Where moderate traffic flows increases are forecast in HGV use, these are generally from the starting point of a low baseline level of HGV use and therefore severance impacts are considered unlikely, even with the high percentage change in HGV vehicle composition. As such the Proposed Development will result in a **low or medium** magnitude of change, and for a receptor of **medium** sensitivity, the effect will be **minor to moderate adverse**, which would represent a potential significant adverse effect.

Driver Delay

- 5.5.20 The traffic impact assessments, contained within the TA, have demonstrated that the forecast development traffic can be accommodated at the proposed site access junction and the impact on the surrounding network is minimal. The distribution of traffic will result in links and junctions across the network experiencing different increases in traffic. As such, it is considered that delay would vary between **negligible** and **low**. Given the receptor sensitivity is **low**, it is concluded the Proposed Development would have a **minor adverse** potential effect on driver delay across the network.

Non-motorised User Delay and Amenity

- 5.5.21 The IEMA Guidelines point out changes in the volume, composition, or speed of traffic may affect the ability of people to cross the road. The fundamental point associated with the Proposed Development is that traffic levels are not predicted to rise on the local road network as a result of the development, except on the M4 slip roads, on and off the motorway, on the circulatory carriageway at Junction 16 and along a short stretch of B4005 (between Junction 16 and the Site Access).
- 5.5.22 Motorway regulations prohibit pedestrians on the slip roads and there are limited pedestrian facilities at the Junction 16 roundabout and on the B4005. Therefore, at locations where there is a predicted change in traffic volumes, there are currently minimal pedestrian movements. It should be noted that the additional mitigation is proposed in the form of a new shared pedestrian footway/cycleway which will facilitate staff movements in the vicinity of the site and this will generally enhance the pedestrian and cycling experience in the area. This is discussed further in

Section 5.6 of this Chapter. Pedestrians in particular are considered less sensitive to changes in traffic if adequate footways and crossing facilities are provided.

- 5.5.23 As such the Proposed Development will result in a **low or medium** magnitude of change, and for a receptor of **medium** sensitivity, the potential effect will be a **minor to moderate adverse** impact on non-motorised user delay and amenity.

Fear and Intimidation

- 5.5.24 Fear and intimidation are discussed in the IEMA Guidelines as the impact on pedestrians due to the volume of traffic, its composition, its proximity to people and the lack of protection. Reference is made above to the fact that pedestrians are prohibited on the slip roads and there are limited pedestrian facilities at Junction 16 and on the B4005 in the vicinity of the site. As such, pedestrians do not frequently use the part of the highway network that will experience an increase in HGV traffic movements.
- 5.5.25 As stated above, it should be noted that a new shared pedestrian footway/cycleway will be offered as additional enhancement to facilitate staff movements in the vicinity of the site. This is to be agreed with Highway Officers at WC during the application process, however, this will generally enhance the pedestrian and cycling experience in the area. Pedestrians in particular are considered less sensitive to changes in traffic if adequate footways and crossing facilities are provided.
- 5.5.26 On this basis it is concluded the proposed MRA will result in a **low or medium** magnitude of change and for a receptor of **medium** sensitivity, the potential effect will be a **minor to moderate adverse** impact on fear and intimidation, which would represent a potential significant adverse effect.

Road Safety

- 5.5.27 The Proposed Development is not predicted to generate any additional traffic, rather it will result in the diversion of traffic already on the highway network; however, it is recognised that traffic movements are predicted to rise on the slip roads on and off the motorway, on the circulatory carriageway at Junction 16, along a short stretch of B4005, and at the site access. Whilst an increase in traffic can give rise to an increased risk of accidents, the relationship is not linear.
- 5.5.28 A road safety audit will be completed for the proposed site access to ensure that the access proposals meet all the required highway design standards and will deliver a safe and efficient access.
- 5.5.29 An assessment of the number of accidents has been undertaken as part of the **TA** and the location has not identified any particular accident hot spots. As such the Proposed Development will result in a **negligible or low** magnitude of change, and for a receptor of **medium** sensitivity, the potential effect will be **minor adverse** which is not considered significant in EIA terms. Whilst an increase in certain traffic movements can increase the risk of an incident, the benefit of additional, purpose-built parking and driver welfare opportunities is considered to outweigh that risk.

Hazardous Loads

- 5.5.30 The Proposed Development will provide parking/driver welfare opportunities for HGVs which are likely to include tankers and other HGVs potentially carrying hazardous loads. The Proposed Development will not generate any additional traffic as these loads will already be on the network;

however, it is recognised traffic movements are predicted to rise on the slip roads on and off the motorway, on the circulatory carriageway at Junction 16 and along a short stretch of B4005.

- 5.5.31 Therefore, there will be an increase in the number of HGVs using these sections of highway, and with it the number of tankers and other HGVs potentially carrying hazardous loads. Whilst an increase in traffic movements can increase the risk of an incident, the benefit of additional, purpose-built parking and driver welfare opportunities is considered to outweigh that risk. On this basis, the Proposed Development will result in a **negligible or low** magnitude of change, and for a receptor of **medium** sensitivity it is concluded the Proposed Development would have a **minor adverse** impact on hazardous loads which is not considered significant in EIA terms.

5.6 ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES

Construction Phase

- 5.6.1 Mitigation measures will be implemented during construction in the form of controls imposed by planning conditions, health and safety legislation requirements and construction site best practices.
- 5.6.2 Management of construction effects will form part of a comprehensive and auditable Construction Environmental Management Plan (CEMP). The CEMP will include control measures, including robustly enforced traffic management measures, to protect the environment, amenity and safety of local residents, businesses, and the general public in the vicinity of the Proposed Development.
- 5.6.3 As part of a CEMP, a construction vehicle routing regime for access to the construction site will be identified and agreed with the local and strategic highway authorities, to ensure that drivers of construction related vehicles do not use inappropriate routes, which are unsuitable due to their width, alignment or character. The regime will ensure that construction vehicles avoid residential and other sensitive areas wherever possible.
- 5.6.4 In addition, the CEMP could include details of any:
- Access arrangements to the Site;
 - The estimated number of vehicles per day/week;
 - Details of the vehicle holding areas;
 - Wheel washing facilities;
 - Estimates for the number and type of parking suspensions that will be required;
 - Details of any diversion, disruption or other abnormal use of the public highway during excavation and construction works;
 - A strategy for coordinating the connection of services on site with any programmed work to utilities upon adjacent land; and
 - Work programme and/or timescale for each phase of the excavation and construction works.

Operational Phase

Highway Improvements

- 5.6.5 The proposal includes a potential link to a footway outside the southern boundary of the Site, adjoining the B4005, which will allow for enhanced pedestrian connectivity from the Site and nearby public transport links. These works are deemed as improvements to the highway and will be agreed through discussions with the Applicant, Council and Highways Department.
- 5.6.6 As previously stated, a Road Safety Audit will be undertaken at the Proposed Site Access to ensure that a safe and efficient access is delivered. This will be agreed with the highway authority.

Travel Plan

- 5.6.7 In order to manage the travel by staff of the new development, a Travel Plan will be implemented.
- 5.6.8 The objective of the Travel Plan is the delivery of the objectives of National Planning Policy, i.e. to encourage staff to travel by non-car modes of travel. The Travel Plan outlines physical and management measures that are designed to achieve this objective.
- 5.6.9 The following Travel Plan measures will be considered:
- Appointment of Travel Plan Co-ordinator;
 - Provision of a Staff Travel Pack;
 - Staff Travel Survey;
 - Staff Travel Awareness and Information;
 - Promotion of Lift Share Scheme; and
 - Encouraging Public Transport Use.

5.7 ASSESSMENT SUMMARY AND LIKELY SIGNIFICANT RESIDUAL ENVIRONMENTAL EFFECTS

- 5.7.1 This chapter has assessed the potential significant environmental effects of the Proposed Development in terms of transport. A comprehensive **TA** has been prepared to inform this assessment and examines in detail the existing transport conditions around the site.
- 5.7.2 The methodology adopted in assessing the traffic and transportation effects of the Proposed Development has been set out and undertaken in line with the advice contained within the IEMA 'Guidelines for the Environmental Assessment of Road Traffic'.
- 5.7.3 As part of traffic flow data, the baseline condition has taken into account a number of committed developments and non-committed developments through the application of traffic growth, and the assessment therefore already takes cumulative effects into account.
- 5.7.4 The assessment concludes that the Proposed Development will result in minimal changes in traffic volume on the majority of the surrounding network and these negligible to low levels of change will be appropriately mitigated by good practice procedures, such as, through the implementation of a Travel Plan and CTMP. Therefore, no significant effects are anticipated with the exception of the

short section of the B4005 where the effects are potentially significant in relation to the increase in HGV volumes. However, these potentially significant effects will be addressed by proposed mitigation provided by the Proposed Development, namely the proposed highway improvements associated with the proposed Site Access proposals and the provision of a new shared footway / cycleway linking to the existing pedestrian crossing infrastructure at J16. The benefits from the provision of a new motorway rest area in terms of providing a rest stop and appropriate amenities for existing drivers should also be recognised.

5.7.5 The findings of the assessment concludes that the highway network will not therefore experience a significant impact as a result of the proposals and highway safety would not be compromised.

5.7.6 A summary of the findings of the ES chapter is provided in Table 5.10.

5.8 CUMULATIVE IMPACTS

5.8.1 The traffic flows that underpin the **TA** (and hence this environmental assessment) have taken into account the various committed development in the study area and therefore cumulative effects inherently form part of relevant assessment scenarios. No significant cumulative transport effects are predicted (see **Chapter 11: Cumulative and Synergistic Effects** for further details).

Table 5.10. Assessment Summary and Residual Environmental Effects

Summary description of the identified impact	Sensitivity of Receptor	Impact Magnitude	Significance and Nature of Effect	Additional Mitigation	Residual Impact Magnitude	Residual Significance and Nature of Effect	Confidence Level
Construction							
Severance	Medium	Negligible	Negligible (Not significant)	Any perception of adverse effect addressed by ongoing and auditable CTMP/Good Working Practices	Negligible	Negligible (Not significant)	Short Term
Driver Delay	Low	Negligible	Negligible (Not significant)	Any perception of adverse effect addressed by ongoing and auditable CTMP/Good Working Practices	Negligible	Negligible (Not significant)	Short Term
Pedestrian Amenity and Non-motorised User Delay	Medium	Negligible	Negligible (Not significant)	Any perception of adverse effect addressed by ongoing and auditable CTMP/Good Working Practices	Negligible	Negligible (Not significant)	Short Term
Fear and Intimidation	Medium	Negligible	Negligible (Not significant)	Any perception of adverse effect addressed by ongoing and auditable CTMP/Good Working Practices	Negligible	Negligible (Not significant)	Short Term
Road Safety	Medium	Negligible	Negligible (Not significant)	Any perception of adverse effect addressed by ongoing and auditable CTMP/Good Working Practices	Negligible	Negligible (Not significant)	Short Term
Hazardous Loads	Medium	Negligible	Negligible (Not significant)	Any perception of adverse effect addressed by ongoing and auditable CTMP/Good Working Practices	Negligible	Negligible (Not significant)	Short Term

Operation							
Severance	Medium	Negligible to Medium	Minor to Moderate Adverse – Potentially Significant	Addressed by proposed Highway Improvements / Travel Plan	Negligible to Low	Negligible to Minor Adverse - (Not significant)	Long Term
Driver Delay	Low	Negligible to Low	Minor Adverse - Not Significant	Addressed by proposed Highway Improvements / Travel Plan	Negligible to Low	Negligible to Minor Adverse - (Not significant)	Long Term
Pedestrian Amenity and Non-motorised User Delay	Medium	Negligible to Medium	Minor to Moderate Adverse – Potentially Significant	Addressed by proposed Highway Improvements / Travel Plan	Negligible to Low	Negligible to Minor Adverse - (Not significant)	Long Term
Fear and Intimidation	Medium	Negligible to Medium	Minor to Moderate Adverse – Potentially Significant	Addressed by proposed Highway Improvements / Travel Plan	Negligible to Low	Negligible to Minor Adverse - (Not significant)	Long Term
Road Safety	Medium	Negligible to Low	Minor Adverse - Not Significant	Addressed by provision of MRA providing safety and wellbeing opportunities for drivers.	Negligible	Negligible to Minor Adverse - (Not significant)	Long Term
Hazardous Loads	Medium	Negligible to Low	Minor Adverse - Not Significant	Addressed by provision of MRA providing safety and wellbeing opportunities for drivers	Negligible	Negligible to Minor Adverse - (Not significant)	Long Term

Chapter 6: Noise and Vibration
Environmental Statement: Volume 1
784-B048803

6.0 NOISE AND VIBRATION

6.1 INTRODUCTION

- 6.1.1 This chapter reports an assessment that has been undertaken to assess the potential impact of noise and vibration on and from the Proposed Development. The assessment was carried out in accordance with relevant local and national planning policy and guidance and considers the effect of construction and operational noise and vibration upon nearby existing sensitive receptors as well as the effect of existing noise sources on the proposed use of the site.
- 6.1.2 The geographical scope of the study area focuses on areas where significant changes to the acoustic environment are likely to occur in terms of the introduction of new noise sources as well as new noise sensitive areas. For the operational phase, this is defined with respect to anticipated changes in traffic flows, fixed plant noise emissions, vehicles moving around the site and noise levels within the proposed buildings. For the construction phase, the nearest noise sensitive receptors to the Proposed Development have been identified and achieving an appropriate noise and vibration impact at these locations ensures that any more distant receptors are also acceptable.
- 6.1.3 The site is located in an agricultural area where noise is mainly influenced by vehicles using the adjacent M4 and, to a lesser extent, the B4005. A more detailed description of the site can be found in **Chapter 3: Description of Development**.
- 6.1.4 This chapter has been authored by Samuel Bryant (MPhys (Hons) CEng MIOA) of Cass Allen.

6.2 METHODOLOGY AND SCOPE

Policy Background

National Planning Policy Framework, 2023¹

- 6.2.1 Conserving and enhancing the natural environment. Paragraphs 174 and 185 require developments to minimise the noise impact of existing and new development on health and quality of life of noise sensitive receptors.
- Noise Policy Statement for England, 2010²
- 6.2.2 The aim of this document is to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion.

Wiltshire Core Strategy, 2015³

- 6.2.3 Core Policy 57 seeks to manage noise from new development and manage existing sources of noise on sensitive development:

‘vii. having regard to the compatibility of adjoining buildings and uses, the impact on the amenities of existing occupants, and ensuring that appropriate levels of amenity are achievable within the development itself, including the consideration of privacy, overshadowing, vibration, and pollution (e.g., light intrusion, noise, smoke, fumes, effluent, waste or litter)’

Guidance

Design Manual for Roads and Bridges (DMRB) volume 11 section 3 part 7 ‘Traffic Noise and Vibration’⁴

- 6.2.4 This document provides guidance on the assessment of the impacts that road projects may have on levels of noise and vibration, with updated guidance for calculating night time noise levels, determining the extent of the study area and selecting appropriate speed data.

BS7385: 1990 Part 1 Evaluation and measurement for vibration in buildings⁵
- 6.2.5 This document sets out methodologies for accurate and effective measurement of ground-borne vibration affecting buildings (and hence occupants of those buildings).

BS7385: 1993 Part 2 Evaluation and measurement for vibration in buildings⁶
- 6.2.6 This document follows on from Part 1 above and discusses the likelihood of damage to buildings occurring due to excessive vibration.

BS7445: 2003 Part 1 Description and measurement of environmental noise⁷
- 6.2.7 Part 1 of this document provides a general guide to quantities and procedures to be applied to measurements of environmental noise for survey purposes.

BS7445: 1991 Part 2 Description and measurement of environmental noise⁸
- 6.2.8 Part 2 of this document provides a general guide to the acquisition of acoustic data pertinent to specific land uses.

BS8233: 2014 Guidance on sound insulation and noise reduction for buildings⁹
- 6.2.9 This document provides assessment methodologies, guidance and criteria regarding establishing appropriate internal noise environments for residential and non-residential uses from external noise sources.

¹ MHCLG (2023). National Planning Policy Framework. Ministry of Housing Communities and Local Government.

² UK Government Planning Guidance (2021), National Planning Policy Framework

³ Wiltshire Core Strategy (2015), Wiltshire Council

⁴ National Highways (2020), Design Manual for Roads and Bridges (DMRB) Volume 11

⁵ British Standards Institute (1990), BS 7385-1:1990 - Evaluation and measurement for vibration in buildings – Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings

⁶ British Standards Institute (1993), BS 7385-2:1993 - Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration

⁷ British Standards Institute (2003), BS 7445-1:2003 - Description and measurement of environmental noise - Part 1: Guide to quantities and procedures

⁸ British Standards Institute (1991), BS 7445-2:1991 - Description and measurement of environmental noise - Part 2: Guide to the acquisition of data pertinent to land use

⁹ British Standards Institute (2014), BS 8233:2014 - Guidance on sound insulation and noise reduction for buildings

- BS6472-1: 2008 Guide to Evaluation of Human Exposure to Vibration in Buildings Part 1: Vibration Sources other than Blasting¹⁰
- 6.2.10 This document provides guidance on predicting human response to vibration in buildings together with advice on measurement methods to be employed. Methods of assessing continuous, intermittent and impulsive vibration are presented.
- BS4142: 2014+A1:2019 Method for Rating and Assessing Industrial and Commercial Sound¹¹
- 6.2.11 This document provides assessment methodologies, guidance and criteria regarding the potential impact of commercial operations (including any mechanical plant) on nearby new and existing noise sensitive receptors.
- BS5228-2: 2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration¹²
- 6.2.12 This part of BS 5228 gives recommendations for basic methods of vibration control relating to construction and open sites where work activities/operations generate significant vibration levels, including industry-specific guidance.
- Key Legislation**
- Control of Pollution Act, 1974**¹³
- 6.2.13 Sections 60, 68 and 72 of Part III of this document Act provides guidance and legislation on reducing the noise impact from construction sites and plant/machinery.
- 6.2.14 **EIA Screening and Scoping Assessment Stage**
- 6.2.15 The EIA Screening exercise concluded that:
- ‘Impacts are expected to be short-term in respect of the construction phase and reduce in the long-term as vehicles switch to electric and hydrogen technology. A detailed Noise Impact Assessment (NIA) covering the operational and transient construction phase will be required incorporating Construction and Transport Environmental Management Plans (CEMP and CTMP).’*
- And
- ‘Construction activity will be managed via agreement of a CEMP and application of best practice principles. Air Quality and Noise studies will be required to assess both the construction and operational phases. Specialist responses have however not sought a full EIA, suggesting that there is not considered likely to be a long-term significant effect on human health.’*
- 6.2.16 Based on the above Screening (See **Appendix 1.2: Screening Opinion Decision Notice**), the local authority has deemed that an EIA is not required for this development, however the associated EIA Screening Matrix states that ‘a detailed Noise Impact Assessment will be required’ (i.e. represented by this chapter).

¹⁰ British Standards Institute (2008), BS 6472-1:2008 - Guide to evaluation of human exposure to vibration in buildings – Part 1: Vibration sources other than blasting

¹¹ British Standards Institute (2019), BS 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound

- 6.2.17 An EIA Scoping Assessment has therefore not been undertaken, although the authors’ professional judgment, applicable guidance and experience of similar schemes has been used to define the scope of this assessment.
- Assessment Methodology**
- Methodology for demolition and construction assessment**
- 6.2.18 There is the possibility of noise emissions due to construction activities impacting upon the nearby noise sensitive receptors. In order to assess this impact, the methodology given in BS5228 has been used. BS5228 sets out criteria, assessment methodologies and mitigation techniques for construction and demolition related noise.
- 6.2.19 Noise levels due to construction works will depend on a number of factors:
- Source noise levels of each of the items of machinery at the site;
 - Typical duty periods of each item of machinery as a percentage of the working day;
 - Position of the machinery at the site;
 - Attenuation due to site topography, ground absorption or barriers; and
 - Reflection of noise from nearby structures.
- 6.2.20 In addition to noise emissions, there is the possibility of ground borne vibration caused by construction operations impacting on noise and vibration sensitive receptors.
- 6.2.21 The threshold of perception of vibration given in BS5228 is between 0.14mm/s to 0.3 mm/s Peak Particle Velocity (PPV). Presented below in Table 6.1 are typical distances (based on data from BS5228) at which vibration levels are just perceptible for various demolition and construction activities.

Table 6.1. Distances of Perceptibility of Vibration from Construction Activities

Activity	Approximate Radius of Perceptibility, meters (m) from BS5228:2
Excavation	10-15
Large Vehicle Movement	5-10
Hydraulic Breaker	15-20
Auger Drilling	<5

- 6.2.22 It is important to note that, although the vibration may just be perceptible at the distances detailed above, BS5228 states that disturbance or complaints are only likely to occur at greater levels of vibration, with damage to buildings requiring significantly higher levels of vibration still. The

¹² British Standards Institute (2014), BS 5228:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration

¹³ Control of Pollution Act (1974), UK Public General Acts

distances presented in the above table therefore represent conservative estimates as to the radius of impact of the proposed works in terms of vibration.

Table 6.2. Construction Activities Noise Significance Criteria – 1m from Sensitive Receptor – Residential and Non-Residential Properties

Noise Level, dB LAeq,T (Magnitude of Impact)	Significance of Effect
>75 (high magnitude of impact)	Major Adverse
70-75 (medium magnitude of impact)	Moderate Adverse
65-70 (low magnitude of impact)	Minor Adverse
<65 (low magnitude of impact)	Negligible

Table 6.3. Construction Activities Vibration Significance Criteria – Human Receptors – Residential Properties

Peak Particle Velocity Vibration Level, mm/s (Magnitude of Impact)	Significance of Effect
>1 (high magnitude of impact)	Major Adverse
0.5-1 (high magnitude of impact)	Moderate Adverse
0.15-0.5 (medium magnitude of impact)	Minor Adverse
<0.15 (low magnitude of impact)	Negligible

- 6.2.23 The duration of the individual activities is expected to be months or years, depending on the individual activity, these activities would be classed as medium-term and temporary and are only expected to impact on a local level.
- 6.2.24 As a result of the current relatively high noise levels at the site, due to road traffic, a ‘medium’ magnitude of change over the baseline scenario (in terms of noise) would be expected to result in ‘significant’ effects (i.e. those of major or moderate adverse significance upon sensitive receptors).
- 6.2.25 As existing vibration levels at the site are relatively low, a ‘high’ magnitude of change (due to construction activities) over the baseline scenario (in terms of vibration) would be expected to result in ‘significant’ effects (i.e. those of major or moderate adverse significance upon sensitive receptors).

Methodology for Determining Operational Effects of Mechanical Plant

- 6.2.26 BS4142 is the appropriate method for assessment of industrial plant noise. BS4142:2014 – Methods for rating and assessing industrial and commercial sound (BS4142) can be used to assess the impact of noise from external industrial and/or commercial noise sources on nearby sensitive receptors.
- 6.2.27 The BS4142 assessment methodology can be summarised as follows:
- ‘Measure the existing background noise levels (LA90,T dB) at the locations of nearby noise sensitive receptors during the quietest periods when the noise source(s) under investigation will operate;*
- Predict or measure the noise emissions (LAeq,T dB) from the noise source(s) under investigation at the location(s) of the nearby sensitive receptors, including corrections for any distinguishable acoustic features (e.g. tones, whines, screeches, hisses etc);*
- Subtract the measured background noise levels (item 1 above) with the measured or predicted rating noise levels (item 2 above) at each sensitive receptor. BS4142 states that:*
- a) Typically, the greater this difference, the greater the magnitude of the impact.*
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*
- NOTE Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.’*
- 6.2.28 The duration of noise emissions from the mechanical plant associated with the Proposed Development is considered to be permanent. Plant noise would potentially affect only the site area and its vicinity; therefore its potential effects are assessed at a local level only.
- 6.2.29 Plant noise levels have been assessed to BS4142:2014 with the aim of the plant rating noise level not exceeding the background noise level.
- 6.2.30 It is considered that effects of major and moderate adverse significance are considered to be ‘significant’, whereas effects of negligible and minor adverse significance are considered to be ‘insignificant’.

Table 6.4. Classification of Significance Criteria for Noise Effects from Proposed Plant

Difference Between Rating Noise Level of the Plant and Lowest Measured Background Levels, LAeq (dB) (Magnitude of Impact)	Significance of Effect
<0.0 (Low magnitude of impact)	Negligible
0.1 to 4.9 (Low magnitude of impact)	Minor Adverse
5.0 to 9.9 (Medium magnitude of impact)	Moderate Adverse
≥10 (High magnitude of impact)	Major Adverse

- Methodology for Determining Operational Effects of Changes in Road Traffic Noise**
- 6.2.31 It is important to ensure that changes in traffic flows on roads due to new large-scale developments do not result in unacceptable increases in noise levels at existing nearby noise-sensitive properties.
- 6.2.32 Baseline and future (2027) traffic data and analysis have been used to calculate the changes in noise emissions from the surrounding roads, both with and without the Proposed Development. The traffic volume forecasts (for 2027) used in this assessment take into account the traffic growth associated with the cumulative schemes.
- 6.2.33 The Average Annual Weekday Traffic (AAWT) flow data was used to calculate the change in noise levels in accordance with the method set out in the Department of Transport (Welsh Office) document Calculation of road traffic noise (CRTN)¹⁴. This method predicts road noise in terms of the A-weighted level exceeded for 10% of the 18-hr period 0600–0000hrs (dB LA10,18hr).
- 6.2.34 The impact of noise generated by the road traffic has been analysed on neighbouring roads in the area. The road traffic noise impact is considered to be permanent and observed on local level only.
- 6.2.35 A change in road traffic noise of 3dBA is the smallest change in noise levels that is considered perceptible outside of a laboratory environment.
- 6.2.36 Classifications for the magnitude of effects that can be expected from changes in road traffic noise are given in the Design Manual for Roads and Bridges (DMRB) volume 11 section 3 part 7 ‘Traffic Noise and Vibration’. The classifications are provided in Table 6.5 below.
- 6.2.37 It is considered that major and moderate adverse effects are considered to be ‘significant’, whereas effects of no change, negligible and minor adverse are considered to be ‘insignificant’.

Table 6.5. Classification of Significance Criteria for Noise Effects from Traffic generated by the Proposed Development

Noise Change, LA10,18h (dB) (Magnitude of Impact)	Significance of Effect
0 (Low magnitude of impact)	No Change
0.1 to 2.9 (Low magnitude of impact)	Negligible
3.0 to 4.9 (Low magnitude of impact)	Minor Adverse
5.0 to 9.9 (Medium magnitude of impact)	Moderate Adverse
10+ (High magnitude of impact)	Major Adverse

- Methodology for Determining the Operational Effects of On-Site Vehicle Movements on Existing Receptors**
- 6.2.38 As on-site vehicle movements will be of the same character as the dominant noise sources in the area and therefore likely to be indistinguishable from the baseline environment if at a sufficiently low level, it is proposed that the effect of on-site vehicle movements is established on a comparative basis using the same criteria presented in Table 6.5 above.
- 6.2.39 A 3D noise model of the Proposed Development was constructed using CadnaA noise prediction software v2023 and sources input to represent vehicles moving around the site with the following assumptions:
- Vehicles moving at approx. 10 km/hr; and
 - 120 HGV and 120 car movements per hour.
- Methodology for Determining Operational Effects of Airborne Noise Affecting the Proposed Development**
- 6.2.40 To assess existing ambient noise levels across the whole site in more detail, topographical survey data was used alongside the measured noise survey data presented in Section 6.3 below and project details to generate a 3D model of the Proposed Development using CadnaA noise prediction software v2023.
- 6.2.41 The 3D model uses the calculation algorithms contained within ISO 9613-2 “Attenuation of sound during propagation outdoors”, taking account of reflection, diffraction and atmospheric absorption effects on the noise propagation (as implemented in CadnaA software).
- 6.2.42 The prediction of noise from the main noise sources (road traffic on the M4 and B4005) has been calibrated using the results of the noise survey below.

¹⁴ Calculation of Road Traffic Noise (1988), Department of Transport (Welsh Office)

- 6.2.43 Based on the results of the CadnaA noise modelling, calculations were carried out to assess the sound insulation requirements of the buildings’ facades in order to achieve suitable internal noise levels.
- 6.2.44 Guidance on achieving acceptable noise levels in noise-sensitive areas of residential development is given in BS8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’. BS8233:2014 provides design criteria for acceptable noise levels to be achieved in noise-sensitive areas of developments and in regards of intermittent noise events refers to World Health Organisation’s document ‘Guidelines for Community Noise’.
- 6.2.45 The BS8233:2014 indoor standard requirements have been specified in Table 6.6 below.

Table 6.6. BS8233:2014 Internal Noise Criteria

Activity	Location	Average Noise Levels Design Range
Speech or telephone communications	Department store, cafeteria, canteen, kitchen	50-55 dB LAeq,T
Speech or telephone communications	Concourse, corridor, circulation space	45-55 dB LAeq,T

Receptor Sensitivity

- 6.2.46 The following nearby receptors are identified as relevant and significant to this assessment:
- Hay Lane Travellers’ Site (Residential) – c.400m east of centre of site;
 - Spittleborough Farm Residences – c.550m north-west of centre of site; and
 - Farm house (name unknown)- c.480m south-west of centre of site.
- 6.2.47 These receptors represent the nearest and most acoustically sensitive and therefore worst case to the Proposed Development. As such if acceptable impacts can be achieved in these locations, then it follows that any more distant receptors will also experience acceptable impacts.

Limitations of the Assessment

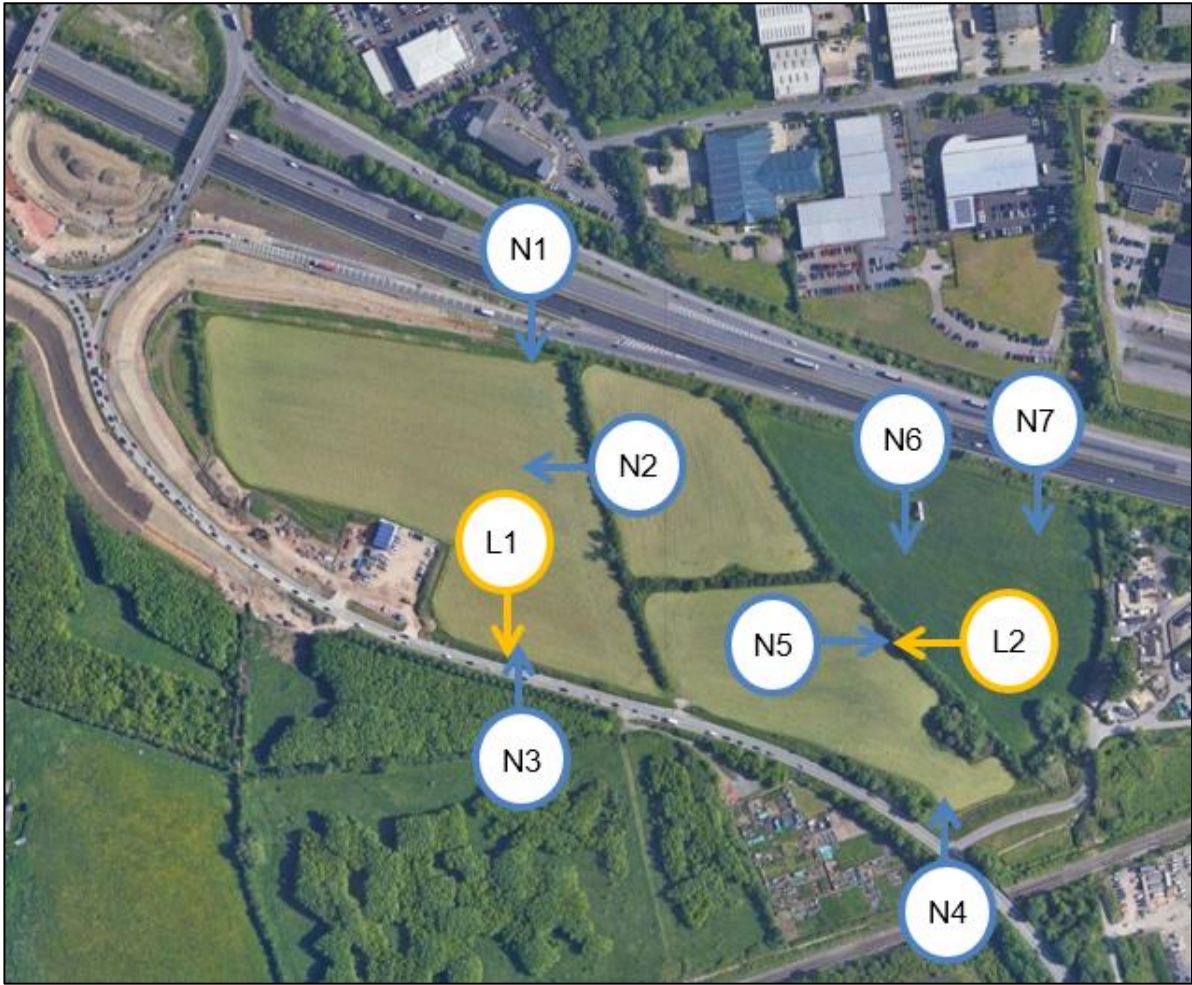
- 6.2.48 For the purposes of 3D noise modelling of construction noise, the ground and buildings surrounding the site have been assumed to be reflecting; however ground absorption has been allowed for on the site itself to account for the lack of hard surface typical whilst sites are under construction.
- 6.2.49 All significant existing noise sources (i.e. those sources that contribute to measurable/perceptible noise levels at the site) have been taken into consideration during the construction of the noise model. No other limitations were encountered in the construction of the noise model or analysis of results that would affect the outcome of the noise and vibration impact assessment.
- 6.2.50 Noise emissions from road traffic have been calculated based on the assumption that the same average vehicle speeds will be present in all time horizons.

6.3 BASELINE ENVIRONMENT

Existing baseline

- 6.3.1 A noise survey of the site and surrounding area was carried out from 9th August 2023 to 11th August 2023. The aim of the assessment was to establish the existing noise environment which may affect the proposed building design as well as to establish background noise levels at positions of nearby sensitive receptors.
- 6.3.2 The survey comprised short-term operator attended noise measurements and longer-term unattended noise monitoring at the site. Noise levels at the site were found to be dictated by road traffic on the M4 and B4005.
- 6.3.3 Figure 6.1 below shows the locations of the measurement positions with Nx representing locations at which attended measurements were carried out and Lx representing locations at which unattended noise logging equipment was deployed.

Figure 6.1. Noise Measurement Positions



6.3.4 The results of the measurements are as follows:

Table 6.7. Attended Measurement Results – 9th August 2023

Position	Time	Meas Length	LAeq,T dB	LAmix, dB	LA90, dB	Observations
N1	15:40	5 mins	71	76	67	Noise dictated by road traffic from the M4
N2	15:48	5 mins	57	62	55	Noise dictated by road traffic from M4 and B4005
N3	15:55	5 mins	71	82	54	Noise dictated by road traffic from M4 and B4005
N1	16:03	5 mins	70	77	66	Noise dictated by road traffic from the M4
N2	16:10	5 mins	55	61	53	Noise dictated by road traffic from M4 and B4005
N3	16:17	5 mins	72	81	55	Noise dictated by road traffic from M4 and B4005
N4	16:27	5 mins	59	68	52	Noise dictated by road traffic from B4005
N5	16:35	5 mins	61	65	59	Noise dictated by road traffic from M4 and B4005
N6	16:41	5 mins	61	66	58	Noise dictated by road traffic from the M4
N7	16:50	5 mins	68	72	65	Noise dictated by road traffic from the M4
N6	16:55	5 mins	67	71	65	Noise dictated by road traffic from the M4

Table 6.8. Unattended Measurement Results – 9th to 11th August 2023

Position	Daytime 0700-2300hrs		Night-time 2300-0700hrs		
	dB LAeq,16hr	dB LA90,1hr	dB LAeq,8hr	dB LA90,15mins	dB LAmix
N1	75	58	66	47	88
N2	61	58	59	52	68

Future baseline

6.3.5 The future baseline has been taken as the year 2027 as the site will be in operation at that point and any impact on local road traffic levels, plant and operational noise emissions, and building design will be fully in effect. No specific projections regarding 2027 road traffic noise emissions without the development are provided in this chapter. However, it is noted that road noise emissions in the local area are likely to increase with or without the Proposed Development. For road traffic noise emissions to change significantly (i.e., by 3 dB or more) then the number of vehicle passes per hour needs to double. This is only typically possible with major changes to the capacity of individual roads along with changes to the use requirements of those roads. As such it is unlikely that significant changes in the local road noise emissions will occur with or without the development. The potential influence of the Proposed Development on 2027 road traffic levels is discussed further in Section 6.5.6 to 6.5.7 below.

6.4 MITIGATION WITHIN THE SUBMITTED DESIGN

6.4.1 The eastern area of the site is proposed to remain clear of buildings and roads (i.e., noise generating areas of the Proposed Development) and as such provides a buffer between the receptors in the Hay Lane Travellers' Site and operations on the site. Where further mitigation may be required, this will form part of the detailed design of the Proposed Development including the building envelope and attenuators/screening to mechanical plant.

6.5 LIKELY SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE SCHEME

Construction Phase

6.5.1 As the Proposed Development is at an early stage, there is limited information regarding specific construction equipment, locations and timetabling of construction related activities. As a result, it is not possible to carry out a detailed assessment predicting construction noise levels at the nearby noise sensitive receptors. Section 6.6. sets out typical best practice construction methods and

guidance in order to reduce the potential noise impact of construction related activities to an appropriate level.

- 6.5.2 The Proposed Development is sufficiently distant from nearby noise sensitive receptors such that the distances presented in Table 6.1 are significantly exceeded and, as a result, it is anticipated that vibration impact associated with construction will be imperceptible and **Negligible** at those receptors.

Operational Phase

Operational Effects of Mechanical Plant

- 6.5.3 As the Proposed Development is at an early stage, there is limited information regarding specific mechanical plant that will be associated with the operation of the site. As a result, it is not possible to carry out a detailed assessment predicting total plant noise levels at the nearby noise sensitive receptors.
- 6.5.4 Based on the results of the site noise survey the following plant noise limits would be appropriate at the nearest noise sensitive receptors in order to achieve a negligible impact. It should be noted that, the background noise levels on the site are dictated by road traffic (particularly from the M4) and, as discussed in Sections 6.5.6 and 6.5.7 below, there is not anticipated to be any significant change in road traffic noise emissions at the time of site operations commencing (2027). As a result, these plant noise limits will remain applicable and are anticipated to be suitable for use throughout the operation of the site.

Table 6.9. Proposed Plant Noise Limits to Achieve Negligible Impact

Receptor Location	Daytime 0700-2300hrs	Night-time 2300-0700hrs
	dB LAr,Tr	dB LAr,Tr
Hay Lane Travellers' Site	58	52
Spittleborough Farm Residences	58	52
Farm House to South-west	58	52

- 6.5.5 Due to the relatively high background noise levels due to the proximity of the M4 coupled with the significant separation between the Proposed Development and the nearest noise sensitive receptors it is envisaged that these plant noise limits will be readily achieved in practice with standard mitigation measures such as silencers, enclosures and barriers.

Operational Effects of Changes in Road Traffic Noise

- 6.5.6 Based on the predicted 2027 road traffic levels (as presented in **Chapter 5: Traffic and Transport**) on the surrounding road network, the following changes to the associated noise emissions have been calculated:

Table 6.10. Changes in Road Traffic Noise Levels – Present Baseline to 2027

Road	Road Traffic Without Development	Road Traffic with Development	Additional Vehicles	Increase, dBA	Significance of Effect
B4005 (E of Site Access)	18587	18821	234	0.1	Negligible
B4005 (W of Site Access)	18587	25182	6596	1.3	Negligible
M4 Eastbound Off-slip	8882	10488	1606	0.7	Negligible
M4 Eastbound On-Slip	10200	11823	1623	0.6	Negligible
M4 Westbound Off-Slip	9884	11454	1570	0.6	Negligible
M4 Westbound On-slip	8479	10032	1553	0.7	Negligible
Swindon Road	30743	30856	114	0.0	No Change
A3102 Franklands	47746	47876	131	0.0	No Change
A3102 (N)	47472	47588	117	0.0	No Change
M4 Mainline (East of J16)	69253	69253	0	0.0	No Change
M4 Mainline (West of J16)	67173	67173	0	0.0	No Change

6.5.7 It can be seen from the above table that the change in road traffic levels on the surrounding roads are anticipated to result in no more than a **Negligible** impact and therefore are considered acceptable with no further mitigation required.

Operational Effects of Airborne Noise Affecting the Proposed Development

6.5.8 The CadnaA 3D noise model was used to establish noise levels incident on the façades of the Proposed Development. The noise model also included an allowance for vehicle movements on and around the site. Figure 6.2 below shows the results of that modelling:

Figure 6.2. 3D Noise Modelling Results – dB LAeq,T



- 6.5.9 The worst case (highest) noise levels incident on any façade of the Proposed Development was calculated to be:
- 67 dB LAeq,16hr.
- 6.5.10 Taking the design targets presented in Table 6.6 this equates to a sound insulation requirement for the building envelope of up to 22 dB in order to meet the most stringent requirement. This is a

relatively low requirement and is envisaged to be readily achievable in the finished development using standard constructions suitable to meet the thermal and structural requirements of the site.

6.5.11 It is therefore anticipated that the impact of internal noise levels within the Proposed Development will be **Negligible**.

Operational Effects of On-Site Vehicle Movements on Existing Receptors

6.5.12 The CadnaA 3D noise model was used to establish the likely change in road traffic noise levels at the position of the nearest noise sensitive receptors based on the assumptions presented in Section 6.2 above. The results of this assessment are as follows:

Table 6.11. Changes in Road Traffic Noise Levels at Existing Receptors

Receptor Location	Change in Road Traffic Noise Levels (dB)	Significant of Effect
Hay Lane Travellers' Site	0.0	No Change
Spittleborough Farm Residences	0.0	No Change
Farm House to South-west	0.0	No Change

6.5.13 In every case there is no predicted change in road traffic noise levels at any of the identified noise sensitive receptors and as a result the overall impact will be **No Change**.

6.6 ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES

Construction Phase

- 6.6.1 The following measures are considered best practice to minimise the potential noise and vibration impact from construction related activities. It is recommended that these measures are included in any Construction Environmental Management Plan going forward.
- 6.6.2 Effective management and communication with the occupants of the nearby sensitive receptors will be essential in minimising the impact of noise and vibration. Notification of commencement of significant stages of work, as well as communication throughout those stages, is likely to reduce the number of complaints arising from the works.
- 6.6.3 The following points will be adopted as far as practical:
- Siting noisy activities and plant away from sensitive receptors;
 - Use of screening or enclosures around static plant and smaller noise generating operations;

- Using ‘silenced’ plant;
- Maintaining all equipment regularly;
- Selecting electrically powered plant and equipment in favour of internal combustion powered hydraulic systems instead of pneumatic and wheeled vehicles instead of tracked;
- Switching off plant and vehicle engines when not in use and avoiding unnecessary revving of engines;
- Use of broadband ‘white noise’ type reversing alarms rather than standard tonal alarms;
- Lowering items in a controlled manner rather than dropping from a height; and
- Should any abnormally noisy activities or works outside normal working hours be anticipated then the local residents and Local Planning Authority should be notified, and operations agreed prior to commencement of work.

Operational Phase

- 6.6.4 No additional mitigation beyond that discussed above is considered necessary in the ongoing design of the Proposed Development in order to achieve no more than **Negligible** impact from the operational phase of the site.

6.7 ASSESSMENT SUMMARY AND LIKELY SIGNIFICANT RESIDUAL ENVIRONMENTAL EFFECTS

- 6.7.1 Following implementation of suitable mitigation measures as discussed above and to meet the design targets detailed, it is envisaged that any residual effects will achieve no more than **Negligible** (not significant) impact during construction and operation.

6.8 CUMULATIVE IMPACTS

- 6.8.1 By their nature, noise impacts (once properly mitigated), are very local in effect as in every case the nearest noise sensitive receptor is considered as a “worst case” and negligible impact is designed to at that location. The impacts on any more distant receptors are therefore considered negligible by extension. A review of the cumulative schemes shows that none are sufficiently close to the Proposed Development (i.e., have a direct line of sight to the site or are directly adjacent buildings or are within approximately 50m of the site) as to be likely to impact on any of the possible noise impact methods detailed above. Therefore, no significant cumulative effects are anticipated (for more information about cumulative impacts see **Chapter 11: Cumulative and Synergistic Effects**).

Table 6.19. Assessment Summary and Residual Environmental Effects

Summary description of the identified impact	Sensitivity of Receptor	Impact Magnitude	Significance and Nature of Effect	Additional Mitigation	Residual Impact Magnitude	Residual Significance and Nature of Effect	Confidence Level
Construction							
Construction noise impact	High	Unknown	Unknown	Best practice means to reduce and minimise construction related noise emissions	Negligible	Not significant	Medium
Construction vibration impact	High	Unknown	Unknown	Best practice means to reduce and minimise construction related vibration emissions	Negligible	Not significant	Medium
Operation							
Plant noise impact	High	Unknown	Unknown	Inclusion of suitable silencers, enclosures and barriers	Negligible	Not significant	High
Airborne noise affecting Proposed Development	Medium	Negligible	Not significant	Suitable building envelope design to achieve appropriate internal noise levels will be readily achievable with typical construction materials	Negligible	Not significant	High
Changes in road traffic noise emissions	High	Negligible	Not significant	None required or available	Negligible	Not significant	High
On-site vehicle movement noise emissions	High	No Change	Not significant	None required	No Change	Not significant	High

Chapter 7: Air Quality

Environmental Statement: Volume 1

784-B048803

7.0 AIR QUALITY

7.1 INTRODUCTION

- 7.1.1 This chapter reports an Air Quality Assessment that has been undertaken to assess the potential air quality impact of the Proposed Development. The assessment was carried out in accordance with relevant local and national planning policy and guidance and considers emissions of construction phase (i.e., dust and particulate matter (PM₁₀)) and operational phase (i.e., nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5})) upon nearby existing sensitive receptors.
- 7.1.2 The geographical scope of the study area focuses on areas where significant changes to pollutant concentrations are likely to occur. For the operational phase, this is defined with respect to anticipated changes in traffic flows, with reference to the Institute of Air Quality Management (IAQM) & Environmental Protection UK (EPUK) screening criteria¹. For the construction phase, an area up to 500m from the site entrance has been considered.
- 7.1.3 The site is located in an agricultural area where air quality is mainly influenced by emissions from vehicles using the adjacent M4. There are no Air Quality Management Areas (AQMA) in the vicinity of the site. The site and surroundings are described in more detail in **Chapter 3: Description of Development**.
- 7.1.4 This chapter has been authored by Hazel Swinfen, Air Quality Consultant (BSc (Hons), AMIEnvSc) and reviewed by Paul Hayward, Technical Director (MSc, BSc (Hons), MIEEnvSc, MIAQM) at Cass Allen Associates Ltd.
- 7.1.5 This chapter is supported by the following technical figure and appendices provided at **Volume 2** to this ES:
- Figure 7.1: Site Context and Dispersion Modelling Extents (shown at the end of the chapter);
 - Appendix 7.1: Operational Phase Significance Criteria;
 - Appendix 7.2: Wind Rose for Fairford (2022);
 - Appendix 7.3: Recommended Construction Phase Mitigation;
 - Appendix 7.4: Traffic Data;
 - Appendix 7.5: Dispersion Model Details; and
 - Appendix 7.6: Dispersion Model Receptors and Results.

7.2 METHODOLOGY AND SCOPE

Policy Background & Key Legislation

Legislation

- 7.2.1 The key national air quality legislation referred to in this assessment is listed below.
- Environmental Protection Act (1990)²
- 7.2.2 Section 79 of the Environmental Protection Act 1990 defines statutory nuisance relevant to dust and particles as:
- 'Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance'; and*
- 'Any accumulation or deposit which is prejudicial to health or a nuisance'.*
- 7.2.3 Furthermore, Section 80 states that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses. However, there are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist and nuisance is a subjective concept, its perception being highly dependent upon the existing conditions and the change which has occurred.
- UK Air Quality Strategy (2007)³
- 7.2.4 The Air Quality Strategy provides a framework for reducing air pollution in the UK, with the aim of meeting the requirements of European Union (EU) legislation. This has been brought into UK law via the EU (Withdrawal) Act 2018 (as amended) and is referred to as 'retained EU law'.
- 7.2.5 The air quality standards set within the Air Quality Strategy are recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO), based on current scientific knowledge regarding the effects of each pollutant on health and the environment.
- 7.2.6 The Air Quality Objectives (AQOs), in Table 7.1 below, are medium-term policy-based targets set by the government, taking into account economic efficiency, practicability, feasibility and timescales. Whilst some of the AQOs correspond with the EPAQS / WHO limits, others have a margin of tolerance, by specifying a number of permitted exceedances of the standard over a given period.
- 7.2.7 Many of the AQOs in the Air Quality Strategy have been made statutory in England via The Air Quality (England) Regulations, 2000, The Air Quality (England) Amendment Regulations, 2002 and The Air Quality Standards (Amendment) Regulations, 2016 – Statutory Instrument 2016 No. 1184.

¹ Environmental Protection UK and Institute of Air Quality Management. (2017). Land-Use Planning & Development Control: Planning for Air Quality. Version 1.2.

² UK Gov. (1990) Environmental Protection Act 1990 - Control of Dust and Particulates Associated with Construction.

³ Department for Environment, Food and Rural Affairs (Defra) and the Devolved Administrations. (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volumes 1 and 2.

Table 7.1. UK National Air Quality Objectives

Pollutant	Objective	Measured As
Nitrogen Dioxide (NO ₂)	40µg/m ³	Annual mean
	200µg/m ³ not to be exceeded more than 18 times per year	1-hour mean
Particulate Matter (PM ₁₀)	40µg/m ³	Annual mean
	50µg/m ³ not to be exceeded more than 35 times per year	24-hour mean
Particulate Matter (PM _{2.5})	20µg/m ³ (Air Quality Standards Regulations (2010) ⁴)	Annual mean

- Clean Air Strategy (2019)⁵
- 7.2.8 The UK Government’s Clean Air Strategy sets out the comprehensive actions required to improve air quality, required from all parts of government and society.
- 7.2.9 The primary focus of previous iterations of the Clean Air Strategy has been NO₂, and its principal source – road traffic. The 2019 Strategy broadens the focus into other areas, including actions on clean growth and pollutant emissions from other sources such as industry, agriculture, and domestic wood-burning stoves.
- Environment Act (2021)⁶
- 7.2.10 The Act mandates that local authorities review and document local air quality within their jurisdiction by way of staged appraisals and respond accordingly, with the aim of meeting the AQOs defined in the Regulations. There is a requirement for local authorities to identify relevant sources of emissions that are likely to be responsible for any failure to achieve the AQOs, or to identify relevant sources within neighbouring authorities’ areas. Where the objective(s) are not likely to be achieved within the relevant period(s), the authority is required to designate an AQMA. For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality, in order to work towards achieving air quality standards in the future.

- National Policy**
- National Planning Policy Framework (2021)⁷
- 7.2.11 Outline guidance for the assessment of air quality affecting new developments is given in the National Planning Policy Framework (NPPF). Relevant sections in this case are highlighted below:
- ‘105. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.’*

- ‘174. Planning policies and decisions should contribute to and enhance the natural and local environment by ... preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of ... air or noise pollution.’*
- ‘185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.’*
- ‘186. Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.’*
- ‘188. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.’*

- Local Policy**
- Wiltshire Core Strategy (2015)⁸
- 7.2.12 Core Policy 55: Air quality states that:
- ‘Development proposals, which by virtue of their scale, nature or location are likely to exacerbate existing areas of poor air quality, will need to demonstrate that measures can be taken to effectively mitigate emission levels in order to protect public health, environmental quality, and amenity. Mitigation measures should demonstrate how they will make a positive contribution to the aims of the Air Quality Strategy for Wiltshire and where relevant, the Wiltshire Air Quality Action Plan. Mitigation may include:*
- i. landscaping, bunding or separation to increase distance from highways and junctions*
 - ii. possible traffic management or highway improvements to be agreed with the local authority*
 - iii. abatement technology and incorporating site layout/separation and other conditions in site planning*

⁴ UK Gov. (2010). Air Quality Standards Regulations.
⁵ Department for Environment, Food and Rural Affairs (Defra). (2019). Clean Air Strategy 2019.
⁶ UK Gov. (2021) Environment Act 2021.

⁷ MHCLG (2023). National Planning Policy Framework. Ministry of Housing Communities and Local Government.
⁸ Wiltshire Council. (2015). Wiltshire Core Strategy.

iv. traffic routing, site management, site layout and phasing

v. where appropriate, contributions will be sought toward the mitigation of the impact a development may have on levels of air pollutants.’

- 7.2.13 The assessment methodology has complied with this policy and suggested mitigation measures have been included within the report.

Draft Air Quality Supplementary Planning Document (2023)⁹

- 7.2.14 This SPD has been used to classify the proposal into Type 1/2/3, which determines the level of air quality assessment and mitigation required. However, this draft document is still under consultation and as such, is not strictly applicable to the Proposed Development at this time.

Air Quality Strategy for Wiltshire 2019 – 2024¹⁰

- 7.2.15 According to this document, it is the responsibility of Wiltshire Council to ‘work collaboratively with sustainable transport, strategic planning, development control and economic development teams to ensure that air quality is properly considered and incorporated into decision making to maintain and improve the built environment and infrastructure.’ It also states that the council ‘will require air quality impact assessments of new ... commercial development in pursuance of core policy 55 and the objectives of this strategy.’ As such, this chapter aims to address these requirements by giving appropriate consideration to all potential air quality impacts of the Proposed Development.

Guidance

The IAQM Guidance on the assessment of dust from demolition and construction (2023)¹¹ methodology has been used to assess the potential impact of dust and PM₁₀ arising from on-site activities. As indicated within the guidance, the use of professional judgment is necessary, due to the diverse range of projects that are subject to dust impact assessment, meaning that it is not possible to be prescriptive as to how to assess the impacts.

EIA Screening and Scoping Assessment Stage

- 7.2.16 The EIA Screening exercise concluded that:

‘According to the DEFRA online Air Quality Management Areas (AQMA) interactive map the site does not sit within an AQMA. Several potential ... air quality receptors, in the form of residential properties, sit to the south and east of the site on the south side of the B4005. Owing to the site’s location, adjacent to the M4, the potential for construction phase impacts is considered to be limited. Any impacts will be mitigated through the implementation of suitable best practice measures to be detailed within Construction Environmental Management Plan (CEMP). [Based on the Transportation screening exercise] there is not anticipated to be a significant effect on vehicle numbers and flows on the M4 arising from the operation of the proposed development.

Overall, follow[ing] implementation of suitable best practice mitigation measures, it is not anticipated that there would be any significant ... air quality impacts.’

- 7.2.17 Based on the above Screening exercise, the local authority has deemed that an EIA is not required for this development, however the associated EIA Screening Matrix states that ‘a detailed Air Quality Assessment will be required’ (see **Appendix 1.2: Screening Opinion Decision Notice**).

- 7.2.18 An EIA Scoping Assessment has therefore not been undertaken, although the authors’ professional judgment, applicable guidance and experience of similar schemes has been used to define the scope of this assessment.

Assessment of Receptor Sensitivity

- 7.2.19 The sensitivity of a human receptor is related to the amount of amenity that can reasonably be expected and the time spent at a location by members of the public. The **highly sensitive** receptors assessed within this chapter are residential properties.

Impact Magnitude

- 7.2.20 Significance criteria applicable to the assessment of vehicle emissions impacts have been derived from the EPUK and IAQM ‘Land Use Planning & Development Control: Planning for Air Quality’ guidance (LUPDC)¹. Where the ‘without’ and ‘with’ development pollutant concentrations are predicted at an individual receptor, the guidance recommends expressing the magnitude of incremental change as a proportion of the Air Quality Assessment Level (normally the applicable AQO).

- 7.2.21 These criteria, along with the corresponding EIA terminology outlined in Table 2.3 of this ES, are included in **Appendix 7.1. Operational Phase Significance Criteria**.

Effect Significance

- 7.2.22 The LUPDC significance criteria applicable to the assessment of impacts at existing receptors are included in **Appendix 7.1. Operational Phase Significance Criteria**. It should be noted that, in line with LUPDC, ‘the criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement... the objective is to identify situations where there is a possibility of a significant effect on local air quality.’

Limitations of the Assessment

Model Uncertainty

- 7.2.23 Uncertainty in dispersion modelling predictions can be associated with a variety of factors, including:
- Model uncertainty - due to model limitations;
 - Data uncertainty - due to errors in input data, including emission estimates, operational procedures, land use characteristics and meteorology; and
 - Variability - randomness of measurements used.
- 7.2.24 Potential uncertainties in the model results were minimised as far as practicable and worst-case inputs used in order to provide a robust assessment. This included the following:

⁹ Wiltshire Council. (2023). Air Quality Supplementary Planning Document (SPD).

¹⁰ Wiltshire Council. (2019). Air Quality Strategy for Wiltshire 2019 – 2024.

¹¹ Institute of Air Quality Management. (2023). Guidance on the assessment of dust from demolition and construction. (Version 2.1).

- Choice of model – Atmospheric Dispersion Modelling Software (ADMS) Roads is a commonly used atmospheric dispersion model developed by Cambridge Environmental Research Consultants (CERC) and results have been verified through a number of studies to make sure predictions are as accurate as possible;
- Meteorological data - Modelling was undertaken using a 2022 meteorological dataset from an observation point in the vicinity of the Site for most representative conditions. A wind rose derived from this data is included in **Appendix 7.2: Wind Rose for Fairford (2022)**.
- Surface characteristics - The z0 and Monin-Obukhov length were determined for both the dispersion and meteorological sites based on the surrounding land uses and guidance provided by CERC;
- Emission rates - Emission rates for each road link were calculated using Defra's Emissions Factors Toolkit V11.0, which determines pollutant concentrations for a specified year, road type, vehicle speed and vehicle fleet composition;
- Variability - All model inputs are as accurate as possible and worst-case conditions were considered as necessary in order to make sure a robust assessment of potential pollutant concentrations.

7.2.25 It is considered that the use of the stated measures to reduce uncertainty and the use of worst-case assumptions when necessary has resulted in model accuracy of an acceptable level.

7.3 BASELINE ENVIRONMENT

Existing and Future baseline

7.3.1 A desktop study of air quality conditions in the vicinity of the site was undertaken, and pollutant concentrations have been reviewed to provide a baseline for consideration in the assessment. The collected data were obtained from Swindon Borough Council diffusion tubes and Defra predicted background concentrations (<https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>) and are included in Tables 7.2 and 7.3 below, respectively.

Table 7.2. Swindon Borough Council Monitored Concentrations – NO₂

ID	Location	Type	Distance to site (m)	Monitored Annual Mean (µg/m ³)				
				2018	2019	2020	2021	2022
S1	GWR Museum	Roadside	4,540	34.0	30.0	24.3	27.2	25.6
S3	S4, 8 Okus Road	Roadside	4,315	19.4	17.8	14.1	15.3	14.9
S4	186 Kingshill Road	Roadside	3,908	30.0	30.5	23.8	25.6	27.1
S6	Swindon 8 - 102 Bath Road	Roadside	4,480	34.3	32.4	28.1	29.4	26.0
S7	No. 81 Kingshill Road	Roadside	4,225	-	44.8	38.3	40.5	36.5
S11	Kingshill Road/Clifton Street	Roadside	4,308	38.4	39.3	32.4	35.1	33.0

S12	Westcott Place	Roadside	3,758	29.8	28.1	22.9	25.0	24.6
S15	102 Kingshill Road	Roadside	4,280	49.1	46.7	40.6	45.0	42.2
S16	86 Clifton Road	Roadside	4,330	26.2	25.8	21.1	21.7	21.9
S18	63 Kingshill Road	Roadside	4,165	30.4	29.5	24.4	26.7	25.2
S19	No. 85 Kingshill Road	Roadside	4,246	-	38.5	32.7	33.1	35.9
S29	Opp 101 Kingshill Road	Roadside	4,290	66.3	60.1	51.8	53.1	56.0
S30	Corner of Kingshill/ Clifton Street	Roadside	4,330	-	75.9	62.2	67.0	69.4
S40	10 Marlborough Road - Wroughton	Roadside	4,695	-	20.5	16.5	17.6	14.7
S41	No.88 High Street - Wroughton	Roadside	4,325	-	20.7	17.1	18.1	16.5

Data obtained from Swindon Borough Council Annual Status Report, 2023.

Table 7.3. Defra Mapped Background Annual Mean Concentrations at the Site (µg/m³)

OS Grid Reference	2022				2027			
	NO ₂	NO _x	PM ₁₀	PM _{2.5}	NO ₂	NO _x	PM ₁₀	PM _{2.5}
409500, 182500	9.8	12.9	13.8	8.7	8.5	11.0	13.4	8.3
410500, 182500 (Site)	14.3	19.5	15.6	9.7	12.0	16.1	15.2	9.3

Data obtained from <https://uk-air.defra.gov.uk/data/laqm-background-home>.

7.3.2 As indicated in Table 7.2, pollutant concentrations at the two closest monitors to the site, S4 and S12, were below the relevant AQOs in the five most recent monitoring years, although it should be noted that pollutant concentrations in 2020 and 2021 are likely to have been reduced as a result of COVID-19 travel restrictions. Furthermore, there is limited Wiltshire Council monitoring in the vicinity of the site and therefore, data from the neighbouring Swindon Borough Council has been used.

7.3.3 Nonetheless, Table 7.3 highlights that Defra predicted background concentrations at the site and existing receptor locations for both 2022 and 2027 are well below (defined by the IAQM as less than 75% of) the relevant AQOs.

7.4 MITIGATION WITHIN THE SUBMITTED DESIGN

Design

7.4.1 With regard to emissions mitigation inherent to the design, 40 electric charging (EV) spaces are to be provided as part of the scheme from day one, with the other spaces subject to appropriate futureproofing to meet future EV demand. The provision of EV infrastructure along with green areas will reduce the emissions associated with the operation of the development in years to come, thus lessening its local air quality impact.

7.5 LIKELY SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE SCHEME

Construction Phase

7.5.1 As sensitive receptors were identified within the relevant IAQM screening distances, the assessment progressed to Step 2, which has been summarised in the tables below.

Table 7.4. Step 2A – Dust Emission Magnitude for Construction Activities

Activity	Magnitude	Explanation
Demolition	N/A	The site is currently vacant.
Earthworks	Large	Total site area between 18,000m ² and 110,000m ² but with >10 heavy earth moving vehicles active at any one time.
Construction	Medium	Total building volume between 12,000m ³ and 75,000m ³ .
Trackout	Large	20-50 outward HDV movements per day but unpaved road length >100m.

Table 7.5. Step 2B – Sensitivity of the Area

Potential Impact	Details	Construction Activity			
		Demolition	Earthworks	Construction	Trackout
Dust Soiling	10-100 receptors within 200m of site	N/A	Low	Low	Low
Human Health	10-100 receptors within 200m of site; low background PM ₁₀ concentration	N/A	Low	Low	Low
Ecological	No designated sites within 50m	N/A	N/A	N/A	N/A

Table 7.6. Step 2C – Summary of Impact Risks to Define Site-Specific Mitigation

Potential Impact	Construction Activity			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Low Risk	Low Risk	Low Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk

7.5.2 Overall, the development is considered to be **Low Risk (minor)** for both dust soiling effects and for PM₁₀ health effects, in the absence of mitigation. Following implementation of the recommended applicable mitigation measures for **Low Risk (minor)** sites in **Appendix 7.3: Recommended Construction Phase Mitigation**, it is anticipated that the residual effect of the construction phase will be **not significant**.

7.5.3 With regard to construction traffic, the construction phase flows are not expected to exceed the IAQM criteria detailed and therefore, significant residual effects are not anticipated.

Operational Phase

7.5.4 To assess the potential air quality impacts resulting from operational phase development-generated vehicle emissions at existing receptor locations, dispersion modelling has been undertaken to quantify pollutant concentrations in both ‘without development’ and ‘with development’ scenarios. The traffic data used in the model are outlined in **Appendix 7.4: Traffic Data** and model details including inputs and verification in **Appendix 7.5: Dispersion Model Details**. The full modelling results detailed in **Appendix 7.6: Dispersion Model Receptors and Results** and a summary of the worst-case impacts is provided in Table 7.7, below.

Table 7.7. Worst-Case Predicted Operational Impacts at Existing Receptors in 2027

Pollutant	Receptor	Annual Mean Concentration (µg/m³)			Impact Descriptor
		Without	With	Change	
Highest Absolute Concentrations					
NO ₂	R4	18.0	18.8	0.8	Negligible (Neutral)
PM ₁₀	R4	16.9	17.0	0.1	Negligible (Neutral)
PM _{2.5}	R4	10.3	10.4	0.1	Negligible (Neutral)
Maximum Predicted Changes					
NO ₂	R4	18.0	18.8	0.8	Negligible (Neutral)
PM ₁₀	≤0.1 change predicted at all receptors				Negligible (Neutral)
PM _{2.5}	≤0.1 change predicted at all receptors				Negligible (Neutral)

Note: Results are reported to the nearest 0.1µg/m³. Any discrepancies in results are due to rounding.

7.5.5 No existing receptors are expected to experience pollutant concentrations in excess of the relevant annual mean AQOs. Furthermore, the impact at all receptor locations is considered **negligible (neutral)** in accordance with LUPDC. As such, the overall effect of the development is considered **not significant** with regard to air quality.

Summary

7.5.6 Based on the extent of predicted population exposure to NO₂, PM₁₀ and PM_{2.5} impacts, the overall effect of the development is considered **not significant**, with regard to air quality.

7.6 ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES

Construction Phase

7.6.1 Mitigation measures for the construction phase will be based on the highly recommended measures applicable to **Low Risk** sites listed in **Appendix 7.3: Recommended Construction Phase Mitigation**.

These will be further explained and refined within the development Construction Environmental Management Plan (CEMP) as highlighted in the **Appendix 1.2 Screening Opinion Decision Notice**.

7.7 ASSESSMENT SUMMARY AND LIKELY SIGNIFICANT RESIDUAL ENVIRONMENTAL EFFECTS

Construction Phase

- 7.7.1 Following implementation of the recommended mitigation measures for **Low Risk** sites outlined in **Appendix 7.3: Recommended Construction Phase Mitigation**, the residual construction phase air quality impacts are judged to be **negligible (neutral)**.

Operational Phase

- 7.7.2 The results of the detailed dispersion modelling assessment indicate that the operational phase air quality impacts will be **negligible (neutral)** without the implementation of mitigation measures.

7.8 CUMULATIVE IMPACTS

Construction Phase

- 7.8.1 The cumulative impact of the following local development sites (planning application references) has been considered within the construction phase assessment (see **Chapter 11: Cumulative and Synergistic Effects** for further details):
- 19/02146/FUL;
 - S/13/1524;
 - PL/2023/02129; and
 - S/OUT/20/0556.
- 7.8.2 It is not anticipated that these development sites will have a significant, cumulative, construction phase air quality impact upon the same sensitive receptors assessed within this Chapter. The closest of these sites (19/02146/FUL) is already partially developed and the remainder are located a considerable distance from the site boundary, as such are unlikely to create a cumulative effect. Furthermore, it is anticipated that these sites will also include best practice mitigation, where applicable.

Operational Phase

- 7.8.3 Traffic data provided by the Project Transport Consultant for the 2027 operational years are inclusive of all committed development in the area and as such, the results of this assessment represent a robust worst-case scenario which takes into consideration the cumulative traffic impact of future local development.

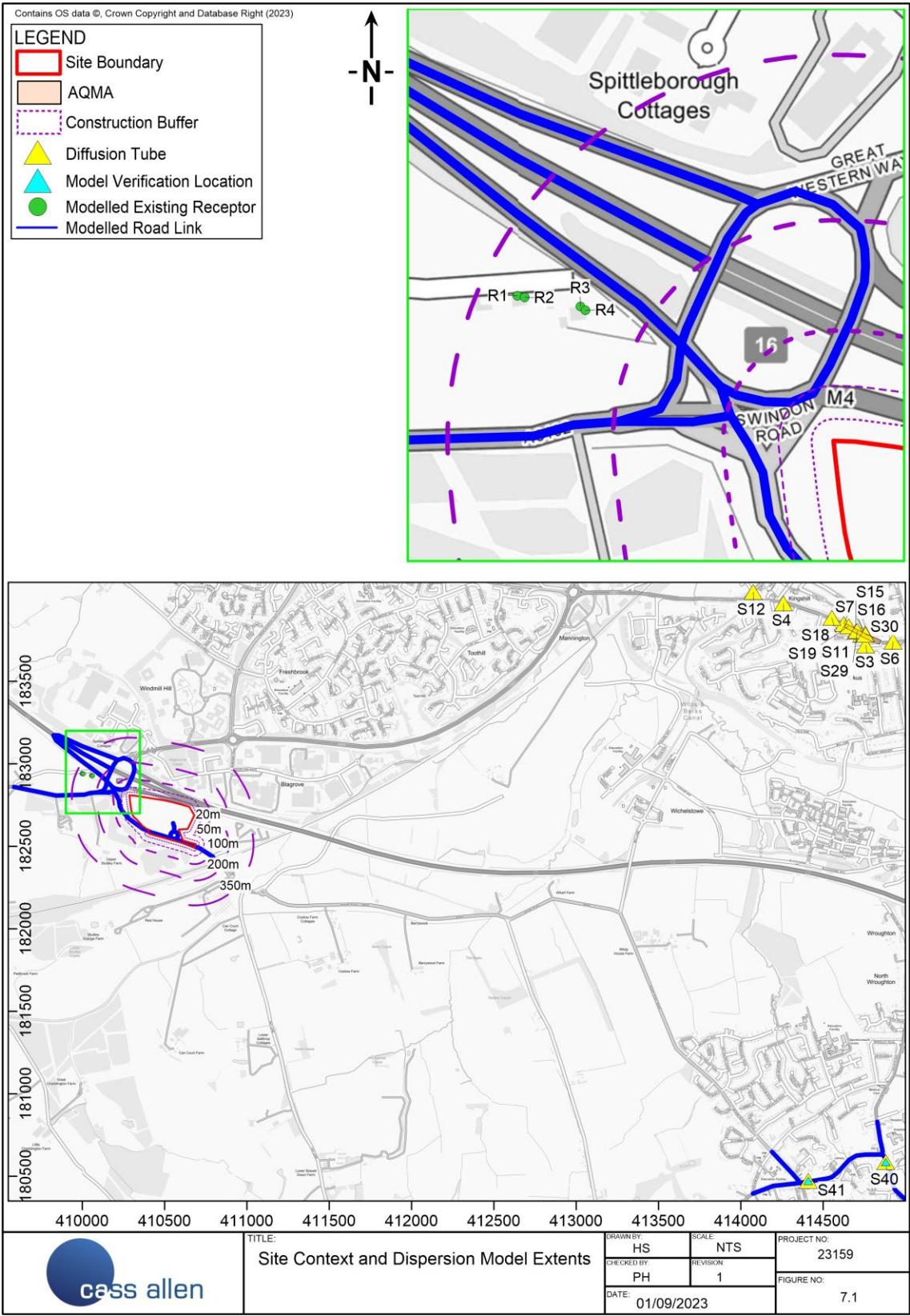
Table 7.7. Assessment Summary and Residual Environmental Effects

Summary description of the identified impact	Sensitivity of Receptor	Impact Magnitude	Significance and Nature of Effect	Additional Mitigation	Residual Impact Magnitude	Residual Significance and Nature of Effect	Confidence Level
Construction							
Earthworks	Low	Low Risk (Minor)	Not significant	•General Communication; •Site Management; •Monitoring; •Preparing and Maintaining the Site; •Operating Vehicles/Machinery and Sustainable Travel; •Operations; and •Waste Management. See Appendix 7.3: Recommended Construction Phase Mitigation for more detail.	Negligible (Neutral)	Not significant	High
Construction	Low	Low Risk (Minor)	Not significant	•General Communication; •Site Management; •Monitoring; •Preparing and Maintaining the Site; •Operating Vehicles/Machinery and Sustainable Travel; •Operations; and •Waste Management. See Appendix 7.3: Recommended Construction Phase Mitigation for more detail.	Negligible (Neutral)	Not significant	High
Trackout	Low	Low Risk (Minor)	Not significant	•General Communication; •Site Management; •Monitoring;	Negligible (Neutral)	Not significant	High

				•Preparing and Maintaining the Site; •Operating Vehicles/Machinery and Sustainable Travel; •Operations; and •Waste Management. See Appendix 7.3: Recommended Construction Phase Mitigation for more detail.			
Operation							
Vehicle emissions	High	Negligible (Neutral)	Not significant	N/A	Negligible (Neutral)	Not significant	High

TECHNICAL FIGURES

Figure 7.1. Site Context and Dispersion Modelling Extents



Chapter 8: Landscape and Visual Impact Assessment

Environmental Statement: Volume 1

784-B048803

8.0 LANDSCAPE AND VISUAL IMPACTS

8.1 INTRODUCTION

- 8.1.1 The approach within this report is derived from the Guidelines for Landscape and Visual Impact Assessment 3rd Edition¹ (GLVIA or “the Guidelines”) published by the Landscape Institute and the Institute of Environmental Management and Assessment in April 2013. The guidance states that Landscape and Visual Impact Assessment (LVIA) is:
- “a tool used to identify and assess the significance of effects of change resulting from development on both the landscape as an environmental resource in its own right and on people’s views and visual amenity”.*
- 8.1.2 This definition of LVIA establishes the distinction between the two components of LVIA where landscape and visual effects are interrelated but should be dealt with separately. Landscape results from the interplay between the physical, natural and cultural components of the land, and visual amenity is the experience of people and their interaction (views) with the landscape.
- 8.1.3 The purpose of this report as part of the ES is to carry out a detailed appraisal of the site and study area, identify landscape and visual receptors likely to be affected, and determine the extent and significance of any potential landscape and visual effects against the baseline conditions.
- 8.1.4 The site and surroundings are described in more detail in **Chapter 3: Description of Development**.
- 8.1.5 This LVIA chapter has been carried out by IDPL, a registered Landscape Institute Practice and team of chartered Landscape Architects, providing impartial judgements based on training and experience, and through clear and transparent processes outlined in the methodology.
- 8.1.6 This chapter is supported by the following appendices provided at **Volume 2** to this ES:
- Appendix 8.1: Baseline Figures and Viewpoint Photographs.
- 8.1.7 A lighting assessment has also been carried out in support of the planning application (SKR Lighting Design, September 2023), which describes the existing baseline situation in terms of glare, light spill and sky glow to enable an assessment of the degree to which the various forms of light pollution will affect both the visual amenity and landscape character. This is required by GLVIA3 (paragraph 6.12) and will be discussed later in the report.
- 8.1.8 A site visit was carried out on 9th June 2023, with the proposed viewpoint locations agreed with the landscape officer. The exact locations have been slightly modified during field survey to ensure best visibility of the site from each viewpoint. The location of each representative viewpoint is illustrated on Figure 8.4 at **Appendix 8.1: Baseline Figures and Viewpoint Photographs**, with related viewpoint photographs set out to current standards.

8.2 METHODOLOGY AND SCOPE

Policy Background

- 8.2.1 The National Planning Policy Framework (NPPF)² – updated in September 2023, sets out the Government’s planning policies for England and provides a framework within which the appropriate local council can produce local and neighbourhood plans; the NPPF is material consideration in making planning decisions.
- 8.2.2 The NPPF sets out three dimension to achieve sustainable development that are economic, social, and environmental considerations. High quality design and local character are repeating themes through the core planning principles. The NPPF also notes the importance that design ‘evolves’ in response to local issues and to the view of local communities and also sets out principles in relation to conservation and enhancement of the natural environment.
- 8.2.3 The design of the development will need to consider the existing technical constraints, but also good design principles as set out in the NPPF to respect the existing setting and avoid significant effects on the wider environment.
- 8.2.4 With relevance to this development site, Chapter 15 ‘Conserving and Enhancing the Natural Environment’ in paragraph 174 states that planning policies and decisions should contribute to and enhance the natural and local environment by:
- 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); and
 - 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.
- 8.2.5 Due to the nature of the Proposed Development and its potential effects with regards to the landscape and visual impacts of light pollution, paragraph 180 of the NPPF states:
- “Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should ‘limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.’*

Local Planning Policy

- 8.2.6 The site is located within the Unitary Authority of Wiltshire. The Wiltshire Core Strategy Development Plan Document (DPD) covers the whole of Wiltshire (excluding Swindon) and contains the following:
- Wiltshire Core Strategy adopted 2015³; and

¹Guidelines for Landscape & Visual Impact Assessment’ 3rd Edition.

² MHCLG (2023). National Planning Policy Framework. Ministry of Housing Communities and Local Government.

³ Wiltshire Council. (2015). Wiltshire Core Strategy.

- Policies Map.
- 8.2.7 The Core Strategy sets out a vision for the spatial strategy of Wiltshire up to 2026, covering Settlement, Delivery and Infrastructure as core themes. The following policies are of relevance to this chapter of the Environmental Statement:
- Core Policy 50: Biodiversity and Geodiversity;
 - Core Policy 51: Landscape; and
 - Core Policy 52: Green Infrastructure.
- 8.2.8 **Core Policy 50: Biodiversity and Geodiversity** states that:
‘Development proposals must demonstrate how they protect features of nature conservation and geological value as part of the design rationale. There is an expectation that such features shall be retained, buffered, and managed favourably in order to maintain their ecological value, connectivity and functionality in the long-term. Where it has been demonstrated that such features cannot be retained, removal or damage shall only be acceptable in circumstances where the anticipated ecological impacts have been mitigated as far as possible and appropriate compensatory measures can be secured to ensure no net loss of the local biodiversity resource, and secure the integrity of local ecological networks and provision of ecosystem services. All development proposals shall incorporate appropriate measures to avoid and reduce disturbance of sensitive wildlife species and habitats throughout the lifetime of the development.’
- 8.2.9 **Core Policy 51: Landscape** states that:
‘Development should protect, conserve and where possible enhance landscape character and must not have a harmful impact upon landscape character, while any negative impacts must be mitigated as far as possible through sensitive design and landscape measures. Proposals should be informed by and sympathetic to the distinctive character areas identified in the relevant Landscape Character Assessment(s) and any other relevant assessments and studies. In particular, proposals will need to demonstrate that the following aspects of landscape character have been conserved and where possible enhanced through sensitive design, landscape mitigation and enhancement measures:
- i. The locally distinctive pattern and species composition of natural features such as trees, hedgerows, woodland, field boundaries, watercourses and waterbodies.*
 - ii. The locally distinctive character of settlements and their landscape settings.*
 - iii. The separate identity of settlements and the transition between man-made and natural landscapes at the urban fringe.*
 - iv. Visually sensitive skylines, soils, geological and topographical features.*
 - v. Landscape features of cultural, historic and heritage value.*
 - vi. Important views and visual amenity.*
 - vii. Tranquillity and the need to protect against intrusion from light pollution, noise and motion.*
 - viii. Landscape functions including places to live, work, relax and recreate.*
 - ix. Special qualities of Areas of Outstanding Natural Beauty (AONBs) and the New Forest National Park, where great weight will be afforded to conserving and enhancing landscapes and scenic beauty*
- 8.2.10 **Core Policy 52: Green Infrastructure** states that:
Development shall make provision for the retention and enhancement of Wiltshire’s green

infrastructure network, and shall ensure that suitable links to the network are provided and maintained. Where development is permitted developers will be required to:

- i. retain and enhance existing on site green infrastructure*
 - ii. Make provision for accessible open spaces in accordance with the requirements of the adopted Wiltshire One space Standards*
 - iii. Put measures in place to ensure appropriate long-term management of any green infrastructure directly related to the development*
 - iv. Provide appropriate contributions towards the delivery of the Wiltshire Green Infrastructure Strategy*
 - v. identify and provide opportunities to enhance and improve linkages between that natural and historic landscapes of Wiltshire.*
- If damage or loss of existing green infrastructure is unavoidable, the creation of new or replacement green infrastructure equal to or above its current value and quality, that maintains the integrity and functionality of the green infrastructure network, will be required...Green infrastructure projects and initiatives that contribute to the delivery of a high quality and highly valued multi-functional green infrastructure network in accordance with the ‘Wiltshire Green Infrastructure Strategy’ will be supported.*

- 8.2.11 The Wiltshire Green Infrastructure Strategy⁴ includes 3 overall goals for achieving the long term vision; (1) Mitigation, adaptation and resilience to climate change; (2) Halting the loss of and improving biodiversity; (3) Contributing to health and wellbeing. With particular relevance to this application, are the *Delivery Themes 1 (Flooding and Water management) and 4 (Woodland and Trees)*. Within Theme 1, the Strategy states that *‘We will work with developers and planners to realise the multiple benefits of designing SUDS as both flood mitigation and local GBI for the benefit of wildlife and recreation.’* Within Theme 4, the Strategy states that *‘In line with our ambition to be carbon neutral by 2030, we will work with our partners to develop a target for increasing tree canopy cover in Wiltshire as part of our new Tree & Woodland Strategy.’*

EIA Screening and Scoping Assessment Stage

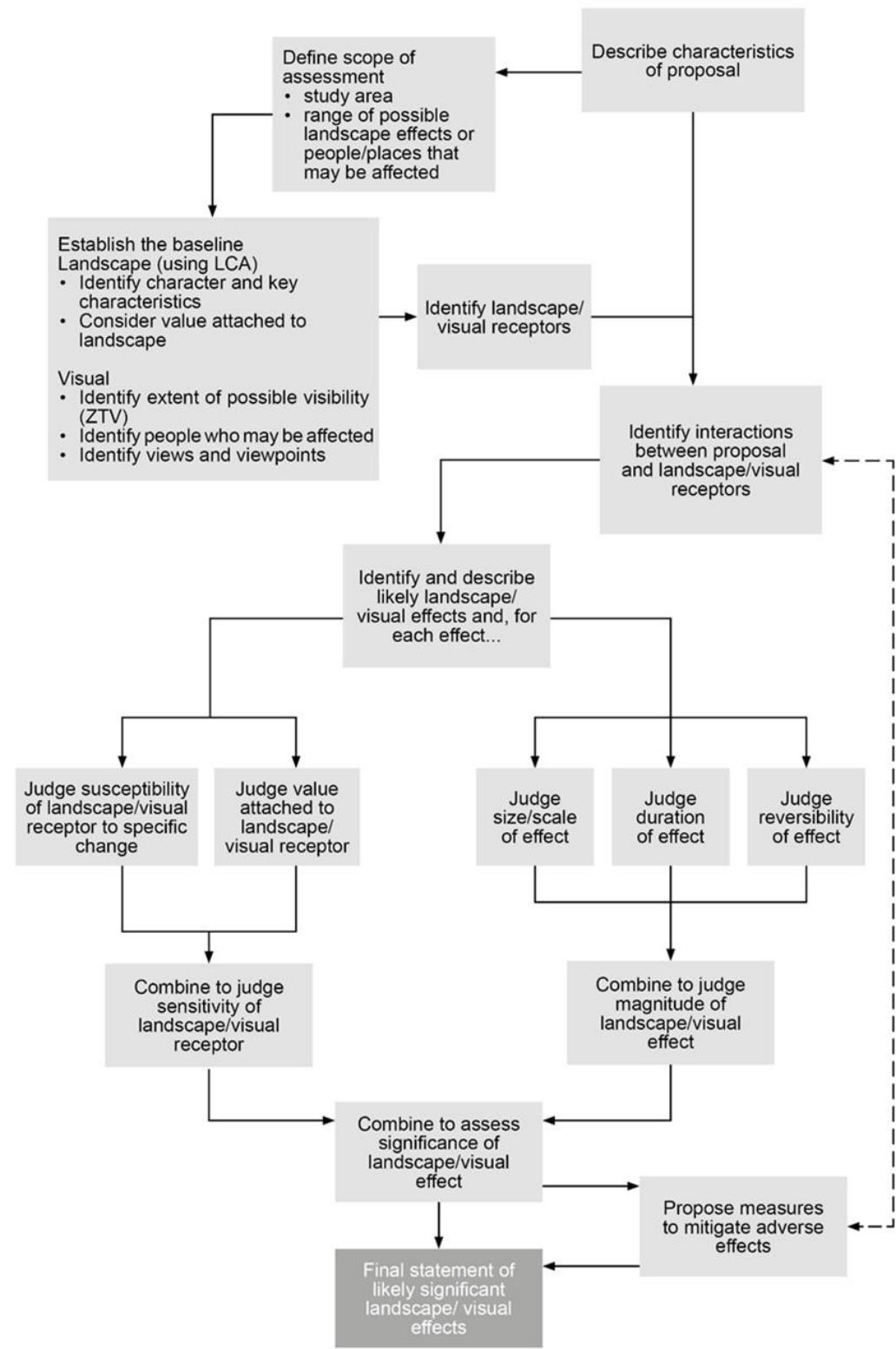
- 8.2.12 A scoping opinion has not been sought as part of the Environmental Impact Assessment. A screening opinion has been received by Wiltshire Local Authority on the 15th of August 2023, which concludes that an EIA is not required. The Screening Matrix response in the ES **Appendix 1.2: Screening Opinion Decision Notice** explains that any arising adverse landscape and visual effects are unlikely to have much potential to be assessed or considered ‘significant’ in the context of the EIA Regulations.

Assessment Methodology

- 8.2.13 The overall process within this LVIA is outlined in the following flow chart (see Figure 8.1 below) based on figures produced in the Guidelines detailing steps in the assessment of landscape effects and visual effects. The scope of the assessment has been thoroughly appraised, to ensure the process is site specific, clear and transparent, and identifies the effects necessary to make a full judgement as to the acceptability of the Proposed Development in landscape and visual terms.

⁴ Wiltshire Council (15 February 2022) A Green & Blue Infrastructure Strategy for Wiltshire.

Figure 8.1. Steps in assessing landscape/visual effects



Landscape Baseline

8.2.14 Baseline studies require a mix of desk study and fieldwork to identify and record the character of the landscape, as well as the elements, features and aesthetic and perceptual factors which contribute

to it. For landscape effects, the study area covers the proposed project site and the wider landscape context within which the proposals may influence landscape character and the full extent of any neighbouring features of special value (e.g. designated areas including AONBs, Historic Parks, Conservation Areas etc.) to reflect the setting of that feature.

8.2.15 The Wiltshire Core Strategy and the Wiltshire Landscape Character Assessment⁵ have formed the basis of the desk study, followed by the site-specific assessment to identify landscape receptors. The process involves the assessment of a combination of physical (e.g., landform, vegetation, buildings), aesthetic/perceptual (e.g., scale, appearance, tranquillity) and cultural/social (e.g., human interaction, land-use, heritage) aspects which together make up the character of the area and its value. An assessment is also made as to the quality, or condition, of the landscape, which involves consideration of the physical state of the landscape and of the features and elements which make up landscape character.

Landscape Value

8.2.16 Value is attached to different landscapes by society, bearing in mind that a landscape may be valued by different stakeholders for a whole variety of reasons. Landscapes or their component parts may be valued at community, local, national, or international levels. A review of existing landscape designations is the starting point in understanding value, but the value attached to undesignated landscapes will be carefully considered and individual elements of the landscape - such as trees, buildings, or hedgerows – may also be of value.

8.2.17 The landscape value has been evaluated using the factors identified in Table 8.1. that are generally agreed to influence value, based on Box 5.1 in the Guidelines.

Table 8.1. Factors that influence landscape value

Factor	Description of Value
Landscape Quality (Condition)	A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Scenic Quality	The term used to describe landscapes that appeal primarily to the senses (primarily but not wholly the visual senses).
Rarity	The presence of rare elements or features in the landscape or the presence of a rare Landscape Character Type.
Representativeness	Whether the landscape contains a particular character and/or features or elements which are considered particularly important examples.

⁵ Wiltshire Council (December 2005) Wiltshire Landscape Character Assessment.

Conservation Interests	The presence of features of wildlife, earth science or archaeological or historical and cultural interest can add to the value of the landscape as well as having value in their own right.
Recreation Value	Evidence that the landscape is valued for recreational activity where experience of the landscape is important.
Perceptual Aspects	A landscape may be valued for its perceptual qualities, notably wildness and/or tranquillity.
Associations	Some landscapes are associated with particular people, such as artists or writers, or events in history that contribute to perceptions of the natural beauty of the area

- 8.2.18 Bearing in mind the above factors, the following elements (which are not intended to be prescriptive) provide an indication of the range of attributes that would need to be considered within the assessment⁶. These should be assessed as to how they contribute or detract from the overall character and quality of the landscape to help identify what should be conserved or protected and what should be enhanced, and provides the basis to consider the sensitivity of the landscape to change as a result of the proposed project.
- Natural features and elements. Examples would include:
 - landform (e.g. ridge lines);
 - trees and woodland (e.g. mature hilltop copse, scrub, or isolated trees);
 - any other natural vegetation (e.g. heathland);
 - water features (e.g. lakes, streams and ditches); and
 - rock formations.
 - Built features and elements. Examples would include:
 - prominent buildings or other landmarks (e.g., a church spire or bridge);
 - settlements and built form (e.g., urban areas, villages, farms or houses);
 - settlement pattern and density (e.g., clustered, isolated or randomly dispersed); and
 - style and characteristics of the built landscape (e.g. old or modern, use of local vernacular materials such as stone or thatch).
 - Historic features and elements. Examples would include:
 - visible ancient monuments (e.g., earthworks, burial mounds and standing stones);
 - visible historic features remaining from past farming and land management systems (e.g., ridge and furrow); and
 - historic buildings, bridges and other structures (e.g., memorials).
 - Features and elements of the managed landscape. Examples would include:
 - hedgerow form or other boundary treatment (e.g., dry stone walling);

- land use (e.g., arable, pasture, urban); and
 - Infrastructure features and elements (e.g., roads, canals, railways).
- Any discordant or intrusive features and elements, such as a conspicuous line of pylons or an area of derelict land.
 - Less tangible aesthetic and perceptual characteristics concerned with how the landscape is experienced and why, including professional judgment on tranquillity, wildness, intimacy, sense of place, scenic quality and other responses or impressions.

Visual Baseline

- 8.2.19 The baseline studies for visual effects have established the geographic area in which the Proposed Development may be visible from, and the different groups of people (receptors) who may experience views of the development. These receptors have been illustrated through several specific/representative viewpoints that are reasonable and proportional to the scale and nature of the Proposed Development. The locations of these photographs have been provided for comment with the Local Authority and this communication has been recorded.
- 8.2.20 The visual baseline has been informed by a Zone of Theoretical Visibility (ZTV) map to provide information on where, theoretically, the proposal is visible from, and this has been refined by fieldwork to confirm which visual receptors will be identified. The ZTV is calculated utilising a digital terrain model (DTM such as NEXTMAP 25) identifying the ‘bare ground’ results which therefore do not take account of local conditions and any above-ground features which can significantly reduce the actual extent of visibility. Therefore, a second stage ZTV is produced to include visual barriers such as woodland and settlements using a digital surface model (DSM such as NEXTMAP 25) to provide a better representation of actual visibility.
- 8.2.21 Likely visual receptors who will be affected by the changes in views and visual amenity include users of open access land, public rights of way (PRoW), the public highway or other transport routes, local residents, and those at work. Views and viewpoints to represent these receptors have been recorded with panoramic images produced in line with the Technical Guidance Note on ‘Visual Representation of Development Proposals’⁷. Data such as the camera, the field of view and weather conditions have been recorded for clarity of information and are shown on the Viewpoint Figures 8.7 to 8.32 within the **Appendix 8.1: Baseline Figures and Viewpoint Photographs**.
- Value of views**
- 8.2.22 The nature, composition and characteristics of the existing views experienced at each viewpoint have been recorded as well as an assessment of value attached to that view. Recognition of the value attached to particular views has taken into account the presence of heritage assets or planning designations, appearance in guidebooks or maps, provision of facilities for their enjoyment (viewpoints, benches, information boards), or specific references in literature/art.
- 8.2.23 The visual receptors most susceptible to change are generally likely to include:
- “Residents at home;

⁶ Taken from Advice Note on LVIA ‘IAN 135/10’ (Highways England).

⁷ Landscape Institute Technical Guidance Note 06/19 17th September 2019.

- People engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focused on the landscape or particular views;
 - Visitors to heritage assets or other attractions, where views of surroundings are an important contributor to the experience;
 - Communities where views contribute to the landscape setting enjoyed by residents in the area.”
- Travellers on road, rail or other transport routes tend to fall into an intermediate category of susceptibility to change. Where travel involves recognised scenic routes awareness of views is likely to be particularly high.”⁸
- 8.2.24 Visual receptors likely to be less susceptible to change include:
- “People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape.
 - People at their place of work whose attention may be focused on their work or activity, not on their surroundings.”⁹

Assessment of Effects

- 8.2.25 The project description outlines the siting, layout, components and other characteristics of the development that are likely to be relevant to the landscape and visual effects. This also includes the primary landscape measures that have been developed through the iterative design process and have become integrated or embedded into the project design. Having established the baseline receptors for both landscape and visual aspects and their value, it is necessary to predict what interactions there will be between these receptors and the Proposed Development. This will follow these stages:
- Evaluate the sensitivity of the receptor through combining judgements on the value attached to the receptor and the susceptibility to change arising from the specific type of development.
 - Identify the magnitude of change through judgements on size/scale, extent, and duration.
 - Combine judgements on sensitivity and magnitude to establish the significance of the effects.
- 8.2.26 Determining the significance of effects is a requirement of the LVIA process through an evidence-based process combined with professional judgement. Under the EIA Regulations the LVIA process must consider the direct effects and any indirect, secondary, cumulative, short-, medium- and long-term, permanent, and temporary, as well as positive and negative effects of the development.
- 8.2.27 In deciding whether effects are positive (beneficial) or negative (adverse), an informed professional judgement has been made, using clearly stated criteria used in reaching the judgement. It is considered that well-designed new development can make a positive contribution to the landscape and need not always be hidden or screened. It is also possible for effects to be neutral in their consequences.

⁸ GLVIA3 paragraph 6.33.
⁹ GLVIA3 paragraph 6.34.

Receptor Sensitivity Landscape Effects

- 8.2.28 The sensitivity of the landscape receptor has been identified by combining judgements of the susceptibility to the type of change or development proposed with the value attached to the landscape as established in the baseline study.
- 8.2.29 Susceptibility is the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular landscape type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the Proposed Development without undue consequences for the maintenance of the baseline situation¹⁰.
- 8.2.30 The overall landscape sensitivity for each receptor has then been categorised balancing the judgements made on the value attached to the receptor and the susceptibility to the type of change arising from the specific proposal. These are categorised into Very High, High, Medium and Low as defined in Table 8.2.

Table 8.2. Landscape Sensitivity Category Definition

Landscape Sensitivity	Definition
Very High	A landscape with very high susceptibility (vulnerability) to change where the type of development would cause large-scale loss to the characteristics of the area. Areas have high landscape value with limited potential for substitution. Likely to be designated at national or regional level and/or rare or high-quality elements or features may be present outside designated areas, especially at a local scale.
High	A landscape with high susceptibility (vulnerability) to change where the type of development would cause some disruption or loss to the characteristics of the area. Areas have medium landscape value with some potential for substitution. Likely to be designated at district or local level and/or medium quality elements or features that are more commonplace but worthy of retention.
Medium	A landscape with medium susceptibility (vulnerability) to change, where the type of development would be consistent with the characteristics of the area. Areas have low landscape value and scope to mitigate for the loss of individual elements/ features. Likely to be non-designated areas where landscape is discordant, derelict or in decline with little or no sense of place.
Low	A landscape of very low importance and prevalence at a local scale where landscape is heavily discordant or derelict and/or poor-quality elements and features that are

¹⁰ GLVIA3 paragraph 5.40.

commonplace.

Receptor Sensitivity: Visual Effects

8.2.31 Each visual receptor has been assessed in terms of their susceptibility to change in views and visual amenity, and the value attached to those views established in the baseline study. The susceptibility varies depending on the occupation or activity of the receptor (people) experiencing the view at particular locations, and the extent to which their attention is focused on the views and the visual amenity they experience from that viewpoint. The visual sensitivity is categorised as Very High, High, Medium and Low as defined in Table 8.3., although in reality there will be some gradation between.

Table 8.3. Visual Sensitivity Category Definition

Visual Sensitivity	Definition
Very High	People at locations where the appreciation of their surroundings is an integral part of the experience. Includes people engaged in recreational use of public land, on National Trails and PRowS, and in designated or high value landscapes. Visitors to recognised heritage assets or other areas of special interest.
High	People at locations where the appreciation of their surroundings is an important contributor to the experience. Includes people engaged in recreational use of public land or PRowS in higher value landscapes, visitors to heritage assets or other attractions, travellers on recognised scenic routes, and residents at home.
Medium	People at locations where the appreciation of their surroundings is evident but not fundamental to the experience. Includes people engaged in recreational use of public land or PRowS in medium value landscapes, those on transport routes, and residents at home with secondary views.
Low	People at locations where their focus is likely to be on their activity and less on their surroundings. Includes people engaged in outdoor and indoor sport, people in private gardens and those on transport routes as well as people in low value landscapes, at their place of work, at school, or travelling along main infrastructure routes.

Magnitude: Landscape Change

8.2.32 The magnitude of change on the landscape resource has been assessed in terms of its size/scale, the geographical extent of the area influenced, and its duration and reversibility¹¹

- **Size or Scale:** the extent and importance of existing landscape elements that will be lost, and the degree to which aesthetic or perceptual aspects are altered either by removal of existing

components or by addition of new ones, and whether this loss is critical to its distinctive character;

- **Geographical extent:** the physical area to which landscape effects will be felt, whether at site level within the development site itself, in the immediate setting of the site, or at a scale of the landscape type or character area;
- **Duration and reversibility:** the duration of the effect whether short, medium or long term, and if the effects are permanent or could be reversed such as some renewable energy developments.

8.2.33 These factors are considered against the baseline conditions and a judgement has been made as to the likely magnitude of effect of the proposals on the landscape resource. This is categorised as Substantial, Moderate, Slight and Negligible as defined in Table 8.4.

Table 8.4. Landscape Magnitude of Change Category Definition

Landscape Magnitude of Change	Definition
Substantial	Substantial or total loss/damage/alteration of key characteristics or features within the landscape, or introduction of new uncharacteristic elements, having a marked and defining effect on the receptor.
Moderate	Moderate scale loss/ damage/alteration of key characteristics or features within the landscape, or introduction of new elements, having a noticeable but not defining effect on the receptor.
Slight	Slight or Minor scale loss/ damage/alteration of key characteristics or features within the landscape, or introduction of new elements, having a limited effect on the receptor.
Negligible	A negligible perceptible change or very limited loss/ damage/alteration of key characteristics or features within the landscape, or introduction of characteristic new elements, having a slight or undetectable effect on the receptor.

Magnitude: Visual Change

8.2.34 Each visual receptor and their sensitivity have been assessed against the magnitude of change in terms of its size or scale, the geographical extent of the area influenced, and its duration and reversibility. The magnitude will be categorised as Substantial, Moderate, Slight and Negligible as defined in Table 8.5.

- **Size or Scale:** the loss or addition of features in the view and changes in its composition including the proportion of the view occupied by the change, the degree of contrast in terms of form, scale and mass, line, height, colour and texture, and the nature of the view whether full, partial or glimpsed;

¹¹ GLVIA3 paragraph 5.48.

- **Geographical extent:** the angle of view in relation to the main activity of the receptor, the distance away from the Proposed Development, and the extent of the area over which the changes are visible;
- **Duration and reversibility:** the duration of the effect whether short, medium or long term, and if the effects are permanent or could be reversed such as some renewable energy developments.

Table 8.5. Visual Magnitude of Change Category Definition

Visual Magnitude of Change	Definition
Substantial	The proposal forms a dominant and uncharacteristic new component in the view with a substantial loss/alteration to key elements, having a marked and defining effect on the amenity of the visual receptor.
Moderate	The proposal may form a perceptible and uncharacteristic component in the view with a moderate alteration to key elements, having a distinct but not defining effect on the amenity of the visual receptor.
Slight	The proposal forms a minor and small-scale component of the view with a minor alteration to key elements, having a noticeable effect on the amenity of the visual receptor.
Negligible	The proposal forms a slight perceptible change or no change in the view, due to distance or intervening topography, buildings or landscape elements.

Effect Significance

- 8.2.35 There is a difference between an ‘appraisal’ which seeks to identify and describe the likely landscape and visual effects, and a formal Landscape and Visual Impact Assessment (LVIA) that will assess the likely significance of the effects identified. The scope of this assessment has been determined through discussions with the Local Authority and will form part of an Environmental Statement.
- 8.2.36 For both a landscape appraisal and an LVIA, the landscape and visual effects have been described and judged whether they are adverse or beneficial, and the likely significance of those effects is the next step within an LVIA. This has been categorised using a sliding scale and followed by a final statement summarising those which are ‘major’ effects, and whether they can be mitigated.
- 8.2.37 Following this example, categories for the level of significance range from Major, Intermediate, Minor and Neutral as defined in Table 8.6.

Table 8.6. Effect Significance Category Definition

Significance	Definition
Major	The proposal would cause a considerable loss or fundamentally change the characteristics and perceptible qualities of the landscape resource or visual amenity. Likely to be a determining issue in its own right. <i>Beneficial</i> – greatly enhance the character/view and create a sense of place <i>Adverse</i> – completely discordant with the character/view and damage to sense of place
Intermediate	The proposal would cause a discernible loss or change to the characteristics and perceptible qualities of the landscape resource or visual amenity. Could be considered a determining issue when combined with other effects. <i>Beneficial</i> – improvement to the character/view and restoration of a sense of place <i>Adverse</i> – conflict with the character/view and some damage to sense of place
Minor	The proposal would cause a minor loss or localised change to the characteristics and perceptible qualities of the landscape resource or visual amenity. Of little consequence in the decision-making process. <i>Beneficial</i> – minor improvement to the character/view and sense of place <i>Adverse</i> – some disparity with the character/view and diminished sense of place
Neutral	The proposal would cause a neutral or negligible change in the landscape resource or visual amenity. Not considered material in the decision-making process. <i>Beneficial</i> – complements the character/view and retains sense of place <i>Adverse</i> – little or no alteration to the character/view and slight loss of sense of place

- 8.2.38 In judging the overall significance of the effects, it is considered that ‘Major’ and ‘Intermediate’ are significant effects as required in the regulations. This approach has been guided by the consistency required in this Environmental Statement.

Mitigation / Enhancement

- 8.2.39 Mitigation measures are proposed to prevent, reduce and where possible offset any significant adverse landscape and visual effects. Enhancement includes any proposals that seek to improve the landscape and/or visual amenity of the Proposed Development site and its wider setting beyond its baseline condition.
- 8.2.40 Mitigation measures generally fall into three categories¹²:

¹² GLVIA3 paragraph 4.21.

- 1. primary measures, developed through the iterative design process, which have become integrated or embedded into the project design;
 - 2. standard construction and operational management practices for avoiding and reducing environmental effects; and
 - 3. secondary measures, designed to address any residual adverse effects remaining after primary measures and standard construction practices have been incorporated into the scheme.
- 8.2.41 Proposed mitigation measures have been well related to local landscape distinctiveness and are also effective in mitigating adverse ecological effects through the appropriateness of the species used.
- 8.2.42 Mitigation measures, especially planting schemes, are not always immediately effective. Where planting is intended to provide a visual filter/screen for the development it is necessary to assess the effects for different seasons and periods of time as agreed with the Local Authority (for example, at year 0, representing the start of the operational stage, year 5 and year 15). Therefore, the significance of effect has been weighed against the baseline conditions and the category reviewed where appropriate to establish any residual effects.

Assessing Cumulative Effects

- 8.2.43 GLVIA3 provides information on assessing cumulative landscape and visual effects. Cumulative landscape and visual effects are usually considered in LVIA when it is carried out as part of EIA. These effects may be caused by a Proposed Development in conjunction with other similar proposed developments or as the combined effect of a set of developments taken together. Cumulative landscape effects are on the physical fabric or character of the landscape or any special values attached to it. Cumulative visual effects can arise where two or more developments are visible from one viewpoint and/or from a sequence of views.¹³
- 8.2.44 The scope of cumulative effects has been agreed at the outset to establish what schemes are relevant to the assessment, and what planning stage is appropriate.
- 8.2.45 The cumulative schemes that are considered relevant for this project are set out in **Chapter 11: Cumulative and In-combination Effects** of the Environmental Statement. Not all of these are relevant to landscape and visual effects as they lie outside of the relevant study area, so a summary of the sites and their relevance is set out in Table 8.7. below.

Table 8.7. Cumulative Schemes

App Ref.	Location	Brief Description	Relevance to LVIA
19/02146/FUL	580m south of Proposed Development	Redevelopment of Garden Centre including demolition and erection of buildings for a family leisure attraction	Will feature in the periphery of Viewpoint 6 only and is development of an existing commercial site with large buildings currently in use

¹³ GLVIA3 paragraph 7.3.

S/13/1524	1.4km to the north east of Proposed Development	Southern town expansion to Swindon of 4500 dwellings	N/A. Enclosed by urban fringe of Swindon and M4 Motorway
PL/2023/02129	1.9km to the south west of the Proposed Development	Outline planning for 410 dwellings and associated infrastructure	N/A. Enclosed by intervening topography and tree belts
S/OUT/20/0556	4.3km to the east of the Proposed Development	Erection of 104 dwellings including highways and access works	N/A. Outside of the study area for Landscape and Visual effects

Limitations of the Assessment

- 8.2.46 Due to the timing and programme for the submission of the Environmental Impact Assessment, The Viewpoint photographs were taken during the summer months with trees in full leaf. This therefore results in a ‘best-case’ scenario in terms of visual screening.

8.3 LANDSCAPE AND VISUAL BASELINE

Site Location and Context

- 8.3.1 The site is located immediately to the south-east side of the M4 Motorway at Junction 16. Comprising approximately 4.5 hectares of primarily agricultural land, the B4005 borders the southern edge of the site, which is approximately 5.1 Kilometres to the south-west of Swindon town centre. The site is bordered by field boundary vegetation to the east and west, with further agricultural field pattern to the east and a strong woodland block to the south of the B4005. A mainline railway is situated within 200m to the east, meaning that the site is within a modest land area bordered by major transport infrastructure.
- 8.3.2 The site is accessible from the B4005 and there is an area of hardstanding where a highways construction compound and materials storage area has historically been located. There is a gated access to the farmland from immediately adjacent to the south-east corner of the site boundary.
- 8.3.3 A significant woodland block borders the southern side of the B4005, directly opposite the site boundary, which continues with further green infrastructure to the east and west through road and rail side buffer planting and trees.
- 8.3.4 Immediately adjacent to the west of the site is the planted motorway junction embankment and to the east are three further agricultural fields of modest size, with hedgerow and trees to the boundary. A solar farm is located within 500m of the site to the west.
- 8.3.5 Beyond the immediate vicinity of the site area to the north of the M4, is an industrial area that forms the edge of Swindon. The landscape to the south, east and west is made up of agricultural land,

commercial premises and farm settlements. There is also evidence of historic surface quarries and open scrub land as well as 3 solar farms within 2km of the site boundary.

Landscape Character Review

- 8.3.6 The local landscape character is identified through a desk-based study and fieldwork to identify and record the characteristic elements, features and the aesthetic and perceptual factors which contribute to it (receptors). The starting point is the hierarchy of published assessments providing more detailed analysis.
- 8.3.7 Natural England is responsible for National Character Area (NCA)¹⁴ profiles to provide environmental evidence and information for England. This identifies that the site lies within NCA 108 – Upper Thames Clay Vale. The assessment offers the following summary description of the site area:
‘...is a broad belt of open, gently undulating lowland farmland on predominantly Jurassic and Cretaceous clays...there is little woodland cover (around 3per cent) but hedgerows and mature field and hedgerow trees are a feature.’
- 8.3.8 The Wiltshire Landscape Character Assessment (LCA) has identified the landscape character area of the site as 11A: Calne Rolling Clay Lowland. This is described in more detail within the assessment as follows:
‘The Swindon-Calne Rolling Clay Lowland is a mix of arable and pasture with the former more prominent to the north above Swindon. The arable fields tend to be large scale and rectangular with a mix of medium sized irregular fields and small regular strips to the south. Fields are bounded by hedgerows although these have been replaced by fences in some areas and hedgerow trees are sparse. The hedges, scattered small woodland blocks (some ancient) and riparian vegetation particularly willows, give a more enclosed and rural feel to the landscape in some sections... Around Swindon large scale buildings on the outskirts dominate immediate views but the area to the north which is very sparsely settled retains a rural remote feel. To the south views of the modern built edges of Calne influence the surrounding landscape, although this is mitigated to some extent by woodland cover. Elsewhere there is little settlement and rural roads criss-cross the area giving access to the uplands to east and west.’
- 8.3.9 The Key Characteristics of Lathe Landscape Character Calne Rolling Clay Lowland include:
- Gently rolling lowland based on clay;
 - Mixed field pattern with network of full hedgerows and mature hedgerow trees;
 - Presence of streams marked by lines of willows and crossed by modest bridges;
 - Woodland blocks including some ancient woodland and wet woodland of high ecological value plus scattered mature trees;
 - Small number of meadows of neutral and unimproved grassland;
 - Scattered settlement of towns, small villages and farmsteads, many using vernacular materials of brick, half timber, stone, tiles and thatch;
 - Roads largely minor and rural with a few trunk roads and sections of motorway;

- Views vary from semi-enclosed by intact hedgerows, riparian vegetation and woodland blocks to more open with views to the rising scarps of the chalk uplands; and,
- A largely peaceful, rural landscape.

8.3.10 The Assessment also identified the valuable landscape attributes, which include:

- Largely rural, tranquil landscape;
- Strong pattern of hedgerows and mature hedgerow trees;
- Many streams with rich riparian vegetation;
- Woodland blocks of high ecological value;
- Small scattered villages of traditional pattern and vernacular materials; and,
- Views to Chalk scarps and Limestone ridge.

8.3.11 There is a list of ‘Forces for change’ highlighted within the assessment, which give an indication of priorities with regards to landscape conservation and restoration. With relevance to this assessment, they include:

- Agricultural intensification and introduction of arable rotation threatens the remaining medieval field patterns and traditional pastoral landscape;
- Hedgerow trees are generally mature with few new trees to replace them;
- Elm loss of 1970’s; and,
- Need for sustainable woodland management including traditional maintenance techniques where appropriate to maintain ancient woodlands and particularly areas of coppice and wood pasture.

8.3.12 In terms of landscape condition, the assessment states that overall, is of **good** condition, due to the intact hedgerows, some woodland and hay meadows of high ecological value and villages of vernacular materials. However, there are elements of poorer condition such as hedgerow trees, with few replacement young trees.

8.3.13 The Strength of Character is judged as **moderate**, due to the influence of prominent urban edges and transport corridors including noise and light pollution. The varied land use of mixed arable and pastoral farming along with the coniferous planting affecting historic woodlands have also been factors in determining a moderate rating.

8.3.14 The Landscape Strategy for the *Rolling Clay Lowland* is to conserve the peaceful rural landscape with its hedgerow network, rich riparian vegetation, remnant meadows, ancient woodlands and pattern of small villages and scattered farmsteads and to strengthen its character through measures to improve the woodlands and farmlands by encouraging management to retain or enhance their biodiversity and historic character.

8.3.15 The Broad Management objectives have been set out in the LCA, highlighted in bold are of particular note for this assessment:

- **Retain and manage the dense hedgerow network and nurture new hedgerow trees;**

¹⁴ Natural England National Character Area Profile 108. Upper Thames Clay Vales.

- Promote appropriate management of arable land including retaining areas of fallow land and maintaining an unploughed margin around fields to encourage wildlife, particularly farmland birds;
- Retain and manage hay meadows;
- Introduce new tree planting along watercourses using typical riparian species such as alder and willow;
- Encourage sustainable woodland management of the varied woodlands using traditional techniques such as coppicing where appropriate to maintain the special historic character and ecological interest;
- **Encourage new woodland edge planting of native deciduous broadleaved to reduce the visual and ecological impact of the coniferous plantations;**
- **Enhance woodland, cattle and horse pasture for bats;**
- Minimise small scale incremental change such as signage, fencing or improvements to the road network which could change the rural peaceful character of the landscape;
- Ensure that landscape is at the foundation of decisions about growth of settlements and that landscape is used to provide a strong framework within which changes can happen in a sustainable way;
- **Consider strengthening the enclosed character of the landscape and screening views to intrusive urban edges through nurturing existing and planting new woodland; and**
- Consider developing guidance for built development to ensure both future construction and changes to existing buildings are designed to integrate with the existing character and structure of settlements.

Physical Landscape Resources

- 8.3.16 The following section describes the individual components of the physical landscape that are present in the site and wider Study Area. These have been reviewed in order to establish an understanding of the specific landscape baseline, including individual elements and more distinctive features which together contribute to local landscape character.
- 8.3.17 **Topography and Landform:** The site is located on a gently undulating landform ranging from 105M AOD to 110m AOD. The lowest part of the site is situated to the south east corner adjacent to the existing hedgerow and access point. The highest part of the site lies to the north west corner adjacent to the Motorway embankment and junction interchange infrastructure. In the wider context, the undulating topography is evident, largely between 100 and 120m AOD, with a steeper rise to levels beyond 150M AOD to the south where the North Wessex Downs AONB begins, approximately 2.5km from the site. This is consistent with the LCA description and the variation in local topography offers a degree of physical and visual containment.
- 8.3.18 **Hydrology and water features:** There are no water feature ponds or ditches on site. According to the Ecological Phase 1 Habitat Survey, two ponds exist within 500m of the site to the east, located within small copses of trees, near to residential development. There is a pond located immediately outside the boundary to the west, between the site and the Junction 16 embankment.

- 8.3.19 **Land Use:** the site comprises agricultural land, grass ley – cropped for haylage. The field pattern is characterised by the M4 Motorway to the north and the highways road B4005 to the south, creating a ‘wedge’ shaped site, with the Motorway junction at the sharp end of the wedge to the west. Around the site, and within the site study area are a variety of land uses that include the southern urban edge of Swindon to the north, Royal Wootton Bassett to the west, the Blagrove Industrial Estate (immediately adjacent to the site on the north side of the M4), Hay Lane permanent Traveller Site (within 500m of the site to the east), commercial premises including visitor attractions, scattered Solar Farms, two County Wildlife Sites, public open spaces and other local informal fields.
- 8.3.20 **Vegetation:** The site is enclosed by hedgerow on its east and west sides with some mature trees forming part of the boundary. Pockets of mixed scrub are present along the south boundary interface with the B4005 and a contained area of neutral grassland wraps around the south, west and north edges of the site. The majority of the site is arable land.
- 8.3.21 **Public Access:** There is no public access to the site. In the immediate context, the local area is reasonably well served by a network of PRoW. The closest to the site is LTRE 6 which runs adjacent to the site boundary at its south east corner having crossed the B4005. This path continues to the west through woodland and Upper Studley Farm, before continuing back over farmland to intersect with Junction 10 of the M4. To the west, the footpath terminates at Hays Lane residential site. Footpaths LTRE 5 and LTRE 59 are also within 500m of the site running generally in an east-west direction.
- 8.3.22 **Development and Transport:** The site is located on the southern edge of Swindon, with only the M4 separating Blagrove Industrial Estate from the site. The landscape here is heavily influenced by the motorway infrastructure and other urban elements such as residential areas, industrial estates, large commercial premises, major highways lighting columns, and electricity pylons.

Landscape Character Summary

- 8.3.23 At the county and local level, the site is characterised by a backdrop of highways infrastructure and urban fringe industrial and commercial buildings, with associated tree buffer planting. In accordance with the Local Character attributes of the site, there is also a strong influence from field boundary hedgerows, some trees and woodland blocks or belts. The extent of vegetation coverage combines with that of gently undulating topography and Motorway embankment to increase the level of physical and visual containment.
- 8.3.24 Given that the site only occupies a very small area of the local landscape, and the extent of containment described above, any change in the physical landscape resources of the site will mainly impact upon the character of the site and its immediate context. Therefore, only the 11A Calne Rolling Clay Lowland is assessed for potential impact upon the local landscape character.
- 8.3.25 As shown on Figure 8.2 within the **Appendix 8.1: Baseline Figures and Viewpoint Photographs**, the 11A Calne Rolling Clay Lowland LCA comprises a varied landscape including large areas of urban Swindon, the M4 corridor, open spaces, various farmsteads, a mix of arable and pasture fields, contained woodlands and part of the North Wessex Downs AONB. Both the ZTV (Figure 8.5 within the **Appendix 8.1: Baseline Figures and Viewpoint Photographs**) and the field survey have confirmed that the site is well contained both physically and visually. The extent of potential influence upon local landscape is mainly to the area within 500m of the site boundary to the south and east.

8.3.26 Considering the features and qualities identified, the local landscape within 11A Character Area are judged to be of **Medium** value overall. The site itself is also considered to be of **Medium** value due to its proximity to open countryside and AONB, but the relatively moderate quality of landscape present on the site and the adjacent Major highways infrastructure.

Visual Baseline

8.3.27 This section provides a description of the nature and extent of existing views from, towards and between the site and surrounding areas. It also includes reference to specific locations that will potentially be subject to impacts due to the Proposed Development. This has been informed by the Zone of Theoretical Visibility (ZTV) shown on Figure 8.5 within the **Appendix 8.1: Baseline Figures and Viewpoint Photographs**, which establishes where, theoretically the proposals may be visible from, and has been refined by desktop work to identify the various visual receptors. The ZTV has utilised a digital terrain model (DTM) such as OS Terrain 5 data with visual barriers included such as woodland and settlements using a digital surface model (DSM) such as NEXTMAP 25.

8.3.28 **Visual Context:** In general, the site is well contained by the mature vegetation along its east and west boundaries. The site is open and visible from the B4005 which is immediately south of the site boundary, but adjacent to this road on the south, a mature woodland block screens the majority of views from areas further south. Some glimpsed views may be possible through natural breaks in the woodland. The M4 Motorway and industrial southern edge of Swindon contain the site to the north. Overall, views into the site are limited to the very close proximity, mainly from the adjacent PRoW and adjacent roads B4005 and Hay Lane. The PRoW adjacent to the site appears little used.

8.3.29 **Visual Sensitivity:** The most sensitive visual receptors are those that use the local landscape and visitors to the local heritage assets, County Wildlife Sites (via public footpaths) and the North Wessex Downs AONB (the edge of which is just within the 3km study area). These are of **Very High** sensitivity to change.

8.3.30 Rural roads, settlements and public rights of way within the wider designated landscape are likely to be of **High to Medium** sensitivity. Views from roads, footpaths and settlements outside designated areas are likely to be of **Medium to Low** sensitivity.

8.3.31 **Night-Time Visual Sensitivity:** With any new development in the countryside, the level and intensity of lighting should be appropriate to the locality and unnecessary light spillage should be minimised. The location of the site immediately adjacent to a major Motorway and lit junction provides a lessening in the level of sensitivity and the **visual effects** the proposals might have.

8.3.32 **Viewpoints and Visual Receptors:** The following table describes the characteristics of each selected Viewpoint as well as a summary of the Visual Receptors and distance from the site.

Table 8.8. Viewpoint Summary and Sensitivity

Viewpoint	Characteristics of View	Visual Receptor	Distance from Site	Sensitivity
VP 1	Representative view looking north into the site from the B4005 that runs adjacent to the site's southern boundary and on a similar AOD to the site.	Road Users	10M	Medium
VP 2	Representative View from M4 Junction 16 exit slip road onto the B4005 southbound. Due to the elevated nature of the junction above the M4, the site is easily visible below to the east with only partial screening offered by the existing hedgerow and hedgerow trees.	Road Users	50M	Low to Medium
VP 3	Representative View from A3102 eastbound on approach to the M4 Junction 16 interchange roundabout. Due to the distance of the Viewpoint from site and the lower level of the site, the highway infrastructure blocks most of the view. Some of the taller trees and background hedgerows are glimpsed.	Road Users	200M	Low to Medium
VP 4	View from B4005 heading west towards the site having crossed the rail line. Due to the elevated position of the viewpoint, the eastern boundary of the site is clearly visible, though the majority of the site itself is screened by the hedgerow and trees along this boundary.	Road Users	75M	Medium
VP 5	View from the PROW 'LTRE 6' passing through the field adjacent to the site in the east. The hedgerow and mature trees along the eastern boundary of the site provide screening into the site.	Recreational users of PROW	75M	Medium to High
VP 6	Representative View from the B4005 roundabout interchange with Wichel Way. A newly completed roundabout, the view looks	Road Users	200M	Medium

	west towards the site but due to the intervening rail line embankments, the site is not visible.			
VP 7	Representative View from Wichel Way on the southern side of the M4 just before it crosses the Motorway. A newly completed road, the view looks west towards the site but due to the intervening rail line embankments, the site is not visible.	Road Users	250M	Medium
VP 8	View from PROW LTRE 59 looking north towards the site. Due to the rail embankment in the foreground of the view, the site is not visible.	Recreational users of PROW	600M	Medium to High
VP 9	View from Pedestrian footpath alongside the A3102 west bound where it meets the entrance to Lydiard Fields Industrial and commercial estate. View is outside the Costa Coffee and Drive Thru. View of the site is not possible due to mature tree buffer and commercial / industrial buildings alongside the M4 in the Blagrove development area.	Recreational visitors to Lydiard Fields commercial premises	200M	Low
VP 10	View from PROW LTRE10 as it crosses the M4 on a raised walkway approximately 1km west of Junction 16.	Recreational users of PROW	1KM	Low to Medium
VP 11	View from PROW LTRE9 looking east from within a solar farm field. The solar farm in the foreground and the intervening woodland block mean that the site is not visible.	Recreational users of PROW	1.2KM	Medium
VP 12	View from Hay Lane, within the North Wessex Downs AONB. The view is on the northbound road looking down towards the lower levels of the Calne Rolling Clay Lowland landscape with Swindon visible beyond. Due to the road side trees and vegetation on the west side of Hay Lane, the site is not visible.	Road Users	2.8KM	High

VP 13	View from the White Horse Trail Long Distance Path as it passes by Bicknoll Castle. The Trail runs along the boundary of the North Wessex Downs AONB and due to the heightened elevation gives views to the north over undulating countryside to the site location. Whilst just outside the study area of 3KM, the view is included due to the importance of the Receptor.	Recreational users of PROW	3.2KM	High
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Future baseline

8.3.33 A future baseline scenario has not been considered in this assessment.

8.4 MITIGATION WITHIN THE SUBMITTED DESIGN

8.4.1 This section considers the type of development proposed and draws the landscape and visual baseline information together to summarise the key constraints and opportunities in the existing landscape. It outlines the key landscape strategies and design principles that form the mitigation and enhancement measures to minimise any adverse effects and optimise the integration of the Proposed Development into its setting.

Design and Landscape Strategy

8.4.2 The full description of the Proposed Development is included in **Chapter 3: Description of Development**.

8.4.3 **Siting and Built Form:** The proposed built form will be sited toward the east of the site, adjacent to a mature hedgerow and trees that run the length of the eastern boundary. This is the existing lower area of the site at between 105m and 106m AOD. The Proposed Development will be pulled away from the site edges to maximise retention of boundary vegetation, maintaining the current visual containment.

8.4.4 The proposed building heights are within the parameters of 109m and 121.5m AOD, with the larger building being the main amenity building. The roofs and fenestration detailing will be designed to reflect the character of this nature of development and submitted as part of a Reserved Matters Application.

8.4.5 **Boundary Treatment:** The existing baseline condition along the B4005 will be altered slightly because of incorporating a new access roundabout for the site. The Access route will require removal of the existing landscape boundary in the southeast along the B4005 for approximately 115m.

8.4.6 There will be enhancement work to the B4005 south boundary with supplementary tree and scrub planting, strengthening the landscape edge. This buffer will be a minimum of 10m, widening to 20m at its eastern end and will incorporate Sustainable Drainage planting.

- 8.4.7 Existing vegetation along the east boundary, in the form of hedgerow and trees, will be retained and reinforced with additional tree and mixed scrub planting. The built form is offset from this boundary by a minimum of 15m, allowing sufficient space for root protection areas. This robust landscape buffer will help minimise the visual impact on receptors to the east of the site as well as provide important habitat creation and enhanced wildlife corridors.
- 8.4.8 Along the northern boundary, existing vegetation will be enhanced from neutral grassland to mixed scrub, which creates a continuous landscape condition that wraps around the development area. The landscape along this northern edge of the site interfaces with the M4 Motorway embankment landscape to create a larger unified habitat area.
- 8.4.9 The western edge of the site will provide an enhanced visual buffer from vehicles on the Junction 16 roundabout looking east. The hedgerow will be retained and protected with mixed scrub planting to integrate with the Junction 16 embankment and wetland area. This area will develop to form an established landscape buffer contributing to physical and visual containment and a soft edge between the site and the Junction 16 infrastructure.
- 8.4.10 The inclusion of a Biodiversity Enhancement Area in the adjacent field to the east of the Development area will provide Biodiversity Net Gain and introduce valuable and targeted habitat creation, which will be managed into the future. This strategy provides a robust mitigation for the loss of agricultural grassland required for the Development.

Construction

- 8.4.11 Construction work will be managed in accordance with a Construction and Environmental Management Plan (CEMP), setting out how environmental issues would be managed in compliance with any particular requirements imposed by the planning authority, as well as in compliance with relevant legislation, regulations and best practice guidance.
- 8.4.12 To ensure adverse impacts associated with the Proposed Development are minimised, mitigation measures would be implemented as outlined in ES Chapter 3, with the following of relevance to the LVIA:
- Minimise construction area and contractor's temporary work area to avoid unnecessary impacts to landscape resources and to minimise visual intrusion;
 - Site hoarding should be designed sensitively in both colour and size, to screen views to the construction work but not form a prominent feature;
 - Follow operational time restrictions to limit after dark works and lighting – the security lighting would be kept to a minimum level needed for visual and security protection; and
 - Existing trees, shrubs, scrub and structural planting would be retained as part of the Proposed Development and appropriate fencing to British Standards erected to protect Root Protection Areas and canopies of planting or trees.

Operation

- 8.4.13 The proposed planting strategy will continue to provide mitigation through the operation of the Proposed Development as it matures and integrates with existing green infrastructure. This will give mitigation for both landscape and visual impacts.
- 8.4.14 The design of the buildings and architecture will be developed sensitively to minimize the visual impact of the Proposed Development. Roof forms and heights of the various built forms will be sympathetic to the location, and coherently designed in relation to each other.
- 8.4.15 Green roofs are proposed to the majority of the buildings to soften the visual impact, reduce glare and provide habitat areas.
- 8.4.16 The **Lighting Strategy** (a separate document that has been produced in support of the planning application) includes mitigation design to reduce the visual impact of external lighting on the landscape and visual amenity of the site and its surrounding area. These are summarized as follows:
- The B4005 access road will be unlit either side of the proposed roundabout to the east and west. This will limit light spill into the adjacent wooded area and hedgerow
 - Light blocking baffles will be used on the 8m column luminaires to limit light spill into the adjacent undergrowth and hedgerows on all sides of the Proposed Development
 - A lighting control system is proposed for the forecourt canopies to ensure lighting levels are sensitive and adjust to the time of day.
 - Bollard lighting will be provided to primary pedestrian paths only and will include downlight baffles to minimize light spill.

8.5 LIKELY SIGNIFICANT LANDSCAPE EFFECTS OF THE SCHEME

Construction Phase

- 8.5.1 The temporary construction works which may give rise to effects on the landscape receptors are considered minimal. The majority of the vegetation to be removed is internal arable grassland and not focused on the site periphery where the visible and more habitat rich landscape typologies are located. The proposed access road is likely to have an immediate effect on the B4005 and vehicles using this road, in terms of site vehicles and construction traffic to build the roundabout itself and then within the application site during the construction phase. Other typical construction activities such as workers accommodation, material stockpiles, lighting of compounds, stripped topsoil and temporary boundary fencing are likely to take place.

Operational Phase

- 8.5.2 The agricultural grassland that currently exists within the site will be replaced with hard landscape areas for vehicles and pedestrians as well as soft landscape features such as trees, swales and buffer scrub planting. Despite the development of the site, the boundary planting and existing trees will be largely retained, with removal required only for a limited distance to provide a maintenance access route into the adjacent field.

Significance of Effects

- 8.5.3 During the baseline assessment the site as a receptor was recorded as being of medium value, whilst some features were noted as being reflective of the Local Character Area key characteristics, the site does not stand out as distinct in terms of character or individual merit.
- 8.5.4 In combining those judgements and the overall characteristics of the site and its boundaries, the sensitivity of the receptor is considered to be **Medium**.
- 8.5.5 The Character Area consists of a varied landscape including large areas of urban Swindon, the M4 corridor, open spaces, various farmsteads, a mix of arable and pasture fields, contained woodlands and part of the North Wessex Downs AONB. There is a network of Public Rights of Way around the site and throughout the Character Area.
- 8.5.6 Due to the central location of the site within the 11A Character Area, it is considered that the other LCA's are too far detached to be affected. The 11A Character Area is noted as having a **Medium** value during the baseline assessment. In terms of landscape sensitivity, it is considered that this receptor is of **Medium** sensitivity overall.
- 8.5.7 The largest scale of effects on landscape character are likely to occur within the site itself. The Proposed Development of vehicular parking, re-fuelling stations and amenity building will replace the agricultural grassland.
- 8.5.8 During the construction stage, the addition of the hoarding, buildings, highways works, large vehicles and workers, storage of materials and other associated activities would be a marked change to the characteristics of the site. The changes along the eastern boundary, where slight gaps in the vegetation are required, and the larger built form is sited, will be most obvious. Due to the temporary nature of the construction stage, the changes are considered to be of **Substantial** magnitude and of **Intermediate** and **Adverse** Significance.
- 8.5.9 When in operation, the proposals would permanently change the site's characteristics with the loss of existing grassland vegetation. Therefore, it is considered adverse in character terms. However, the retention and enhancement of peripheral trees, hedgerows and scrub will help assimilate the Development over time. The magnitude of change is considered **Moderate**, as the development is a notable alteration to the site character, but considering the landscape mitigation measures and retained vegetation there should not be a defining effect on the receptor. The significance of effect will therefore be **Minor** and **Adverse**.
- 8.5.10 Beyond the site boundary during construction, the scale of effect would be diminished as the changes to the site would have less prominence and therefore less influence on defining landscape character. Up to 300m from the site, namely the PRow and rail line to the east, the construction of the Development would have a notable effect on the landscape character. The large plant and machinery and other more prominent activities will have a temporary disruptive effect, though the setting adjacent to a major motorway is not currently tranquil. Beyond 300m from the site, the effects will reduce to negligible. Therefore, it is considered that there will be a **Minor** and **Adverse** significance of effects on the 11A character area overall.

When considering the longer time frame of the Development and the maturation of proposed planting within the scheme, the proposals would be perceived as a slight alteration to the 11A Character Area as the sense of transition between urban, industrial fringe, highways infrastructure and open countryside is softened with mature green infrastructure.

Table 8.9. Landscape Effects Summary

Landscape Receptor	Main Characteristics	Sensitivity	Likely Landscape Impacts	Magnitude of Change	Significance of Effect
The site and its boundary	The site is located immediately to the south-east side of the M4 Motorway at Junction 16. Comprising approximately 4.5 hectares of primarily agricultural land, the B4005 borders the southern edge of the site, which is approximately 5.1 Kilometres to the south-west of Swindon town centre. The site is bordered by field boundary vegetation to the east and west, with further agricultural field pattern to the east and a strong woodland block to the south of the B4005. A mainline railway is situated within 200m to the east, meaning that the site is within a modest land area bordered by major transport infrastructure.	Medium	Construction – disruptive works for the duration of the construction phase will cause a marked change to the existing characteristics of the site. This will be most evident from the new access off the B4005 adjacent to the southern boundary and the M4 junction 16, which has an elevated view over the site.	Substantial	Intermediate <i>Adverse</i>
			Operation – the Proposed Development and associated infrastructure will permanently change the characteristics of the site from agricultural grassland. The retention of boundary planting, hedgerows and trees, supplemented by enhanced planting and targeted habitat creation will help integrate the site over time.	Moderate	Minor <i>Adverse</i>
Landscape Character Area 11A: Calne Rolling Clay Lowland	The character area is a mix of arable and pasture with the former more prominent to the north above Swindon. The arable fields tend to be large scale and rectangular with a mix of medium sized irregular fields and small regular strips to the south. Fields are bounded by hedgerows although these have been replaced by fences in some areas and hedgerow trees are sparse. The hedges, scattered small woodland blocks (some ancient) and riparian vegetation particularly willows, give a more enclosed and rural feel to the landscape in some sections. Around Swindon large scale buildings on the outskirts dominate immediate views but the area to the north which is very sparsely settled retains a rural remote feel. To the south views of the modern built edges of Calne influence the surrounding landscape, although this is mitigated to some extent by woodland cover.	Medium	Construction – temporary works may have a minor and adverse indirect impact on landscape character at a localised level due to additional traffic and noise etc.	Moderate (up to 300m from site) Slight (300m+ from site)	Minor <i>Adverse</i>
			Operation – Due to its proximity to the M4 motorway and large scale development on the south side of Swindon, along with the landscape mitigation strategy maturing over time, the impacts on the wider Local Character Area will be lessened from Construction stage.	Slight	Neutral
Physical Landscape Resource and	The Site's physical landscape and habitat is comprised predominantly of modified grassland. There are isolated pockets of bramble and mixed scrub as well as hedgerows and trees along the eastern and western borders. Neutral	Low-Medium	Construction – The temporary construction works will impact the existing grassland areas, due to their removal. The small isolated pocket of scrub in the south east will require removal and two minor access points will be needed through the hedgerow on the eastern	Substantial	Intermediate <i>Adverse</i>

Habitat	grassland makes up the remainder of the habitat type where the road embankments are located.		boundary. The presence of heavy machinery and the regular movement of construction traffic will have an adverse effect on the habitat resource of the Site.		
			Operation – The permanent works will impact the existing grassland areas, due to their removal. The small isolated pocket of scrub in the south east will require removal and two minor access points will be needed through the hedgerow on the eastern boundary. New planting and varied landscape typologies will be implemented, including biodiversity enhancement, which will have a beneficial effect on the habitat resource of the Site.	Moderate	Minor <i>Adverse</i>

8.6 LIKELY SIGNIFICANT VISUAL EFFECTS OF THE SCHEME

Construction Phase

- 8.6.1 The Proposed Development will result in significant changes to the visual environment during the construction stage. These changes will be mainly focused around the vehicular routes along the B4005 and the M4 Junction 16 overpass. The primary visual envelope is within 300m of the site, to the west, south and east. The M4 motorway to the north acts as a visual barrier, as does the rail line embankment to the south and east. Plantation woodland to the south and west also restrict longer range views, though this landscape feature cannot be relied upon in the future as the woodland is likely to be on a crop rotation cycle.
- 8.6.2 During construction, views of the site will be characterised by boundary hoarding, movement of construction and delivery vehicles, construction plant, workers, welfare facilities and ancillary compound buildings. The greatest visual effects are most likely to occur from the M4 Junction overpass, looking down on, and across, the site. Residents of properties nearby the site will likely notice a change in traffic, delivery vehicles and general construction works during this period.
- 8.6.3 Glimpsed views of the activity on site from further away than the 300m envelope may be possible, particularly when larger construction machinery and plant equipment are on site. The height of this construction equipment and the overall building upper parameter height are above the majority of the existing hedgerows and so therefore will be visible from certain locations.

Operational Phase

- 8.6.4 Once operational, the character of the site will have changed and will comprise less vegetation within the main site area, but enhanced vegetation to the periphery. From local roads the visual effects are likely to be varied depending on the proximity and available direct views to the site between the varying forms of transport infrastructure, woodland and hedgerows, and undulating topography.
- 8.6.5 A Service Station development will be in keeping with the character of much of the surroundings, including larger scale commercial premises and attractions, Motorway and associated highways, and retail premises that are synonymous with transport services. Therefore, receptors will not be significantly affected.

Significance of Effects

- 8.6.6 The visual receptors are represented by panoramic photographs of each viewpoint, illustrating the landscape context and annotated for ease of reference. These are shown on Figures 8.7 to 8.32 within the **Appendix 8.1: Baseline Figures and Viewpoint Photographs**, with separate figures also showing single frame photographs taken from each panorama.
- 8.6.7 The Viewpoints have been summarised and described in Table 8.8.
- 8.6.8 The most visual effects are on the immediate vicinity of the site from the M4 Junction 16 overpass and the B4005 adjacent to the site. Both of these views are medium sensitivity due to them being views for road users rather than residents or leisure activities. The public footpath in the adjacent

field to the east will also incur a visual effect, though the existing hedgerow and trees will offer some screening and softening to this view.

- 8.6.9 Once the development is completed the landscape mitigation and design strategy will help to soften the development and the visual impact on the Viewpoints most affected will lessen as the planting and trees grow.
- 8.6.10 For the wider viewpoints that are within the Zone of Theoretical Visibility to the south of the site, the backdrop to these views (if available) will be the southern part of Swindon where existing large scale development is located, albeit with green infrastructure to soften the views.

Table 8.10. Visual Effects Summary

Visual Receptor	Main Characteristics	Sensitivity	Magnitude of Change	Significance of Effect
Viewpoint 1: Looking north into the site from adjacent B4005	Open and direct views over the entire site. Boundary vegetation visible with the site levels lower than the viewpoint.	Medium	Construction: Substantial	Intermediate <i>Adverse</i>
			Operation: Moderate	Minor <i>Adverse</i>
Viewpoint 2: From adjacent M4 Junction 16 overpass looking east	An elevated viewpoint that provides open and direct views over the entire site. Boundary vegetation in the foreground clearly visible and gives some limited visual screening.	Low-Medium	Construction: Substantial	Intermediate <i>Adverse</i>
			Operation: Moderate	Minor <i>Adverse</i>
Viewpoint 3: From A3102 approach to Junction 16 looking east	Limited views of the site due to dominant road infrastructure in the foreground and the site being substantially lower beyond.	Low-Medium	Construction: Slight	Minor <i>Adverse</i>
			Operation: Slight	Minor <i>Adverse</i>
Viewpoint 4: From B4005 looking west having just crossed the rail line	Open view towards the site eastern boundary, with hedgerow and trees prominent on the boundary and providing reasonable screening. Site level is slightly lower than Viewpoint. Road and mature trees frame the left of the view and pylons are clearly visible to the right of the view.	Medium	Construction: Moderate	Intermediate <i>Adverse</i>
			Operation: Slight	Minor <i>Adverse</i>
Viewpoint 5: From PRoW LTRE6 passing through field adjacent to east boundary of site	Open view from footpath in agricultural field adjacent to site. Hedgerow and trees on eastern boundary provide significant screening, particularly to the right of the view. Site level is similar to Viewpoint. Glimpses of B4005 to the left of the view possible.	Medium-High	Construction: Moderate	Minor <i>Adverse</i>
			Operation: Slight	Minor <i>Adverse</i>

Viewpoint 6: From B4005 roundabout interchange with Wichel Way looking west	Due to the elevated Railway embankment, there are no views to the site.	Low-Medium	Construction: Negligible	Neutral
			Operation: Negligible	Neutral
Viewpoint 7: From Wichel Way adjacent to M4 motorway looking west	Due to the elevated Railway embankment, there are no views to the site.	Low	Construction: Negligible	Neutral
			Operation: Negligible	Neutral
Viewpoint 8: From PRoW LTRE59 on south side of railway embankment, looking north	The Viewpoint is elevated above the Rail line. A large, mature woodland block in the mid-ground screens views to the site. Pylons are visible above the treeline in the distance. If the plantation woodland is cropped, this may open views to the Proposed Development, but currently no view is possible.	Medium-High	Construction: Negligible	Neutral
			Operation: Negligible	Neutral
Viewpoint 9: From pedestrian footpath adjacent to A3102 (north of M4) looking south west	Due to intervening commercial buildings and M4 green infrastructure buffer planting, no views to the site are possible. Winter views may provide glimpsed or partially screened activity on site.	Low	Construction: Negligible	Neutral
			Operation: Negligible	Neutral
Viewpoint 10: From PRoW LTRE10 overpass bridge of the M4, 1km west of Junction 16, looking east	View at 1km distance from site. M4 motorway dominates view with embankments and green infrastructure planting providing softening and screening. Minor glimpsed views of the site may be possible and would be more apparent in winter.	Low-Medium	Construction: Slight	Neutral
			Operation: Slight	Neutral
Viewpoint 11: From PRoW LTRE9 as it passes through a solar farm field, looking east	View at 1km distance from site. Undulating topography, field hedgerows and mature trees, and farm buildings in mid-ground block views to the site. Glimpsed views may be possible in winter.	Medium-High	Construction: Slight	Neutral
			Operation: Slight	Neutral

Viewpoint 12: View from Hay Lane within North Wessex Downs AONB, looking north	View at 3km from site within North Wessex Downs AONB looking over LCA 11A Calne Rolling Clay Lowland. Roadside trees and hedgerows restrict views to site.	Medium-High	Construction: Slight	Minor
			Operation: Slight	Minor
Viewpoint 13: View from white Horse Trail PRow Long Distance Path within North Wessex Downs AONB, looking north	View at 3.2km from site on the White Horse Trail Long Distance Path, as it passes Bicknoll Castle, within North Wessex Downs AON. The heightened elevation of the viewpoint gives a vista over gently undulating countryside, with the site location nestled into the field pattern of hedgerows and trees.	High	Construction: Slight	Minor <i>Adverse</i>
			Operation: Negligible	Neutral

8.7 ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES

8.7.1 There are no additional mitigation, compensation or enhancement measures.

8.8 ASSESSMENT SUMMARY AND LIKELY SIGNIFICANT RESIDUAL ENVIRONMENTAL EFFECTS

- 8.8.1 As described in the Methodology section of this Chapter, Major effects are considered to be significant and material to decision making with Intermediate effects having the potential to be material to decision making. Based on the findings of this LVIA, it is considered that, in the long term, the Proposed Development accords with the landscape and visual requirement of planning policies and guidelines and can be accommodated without giving rise to significant landscape and visual effects.
- 8.8.2 The inclusion, in the Proposed Development, of a Biodiversity Enhancement Area within the eastern field of the site will provide targeted and valuable habitat creation to achieve Net Gain, mitigating the loss of landscape required in the Development Area.
- 8.8.3 There are direct, short distance views of the site from the vehicular routes immediately adjacent to the site and from a PRoW that crosses the road next to the site to the east. Other than this, views of the site and Proposed Development are partial, filtered or heavily filtered from surrounding properties or Public Rights of Way in the middle distance. From the long-distance receptors, views of the site are very limited or not possible due to intervening vegetation or topography.
- 8.8.4 The potential impact upon the physical landscape resources is considered to be **Beneficial** due to: the establishment of new scrub, hedgerow and tree planting; incorporation of existing landscape components into green infrastructure; incorporation of SuDS and the specific Biodiversity Enhancement Area.
- 8.8.5 Landscape and Visual effects have been assessed for construction and completion – assuming the establishment of mitigation.

- 8.8.6 Landscape effects at the construction stage have been assessed to be **Temporary Intermediate Adverse** at the site level and **Temporary Minor Adverse** at the Character Area level. There would be **Temporary Minor** to **Intermediate Adverse** effects upon the visual receptors of **Low** to **Medium** sensitivity in close proximity to the site.
- 8.8.7 Operational effects would be improved due to the implementation of the landscape proposals. Landscape effects at the site level have been assessed to be **Minor Beneficial** and **Intermediate Beneficial** for the physical habitat resource. The Visual effects have been assessed as either Neutral or **Minor Adverse**.

Table 7.8.19. Assessment Summary and Residual Environmental Effects

Summary description of the identified impact	Sensitivity of Receptor	Impact Magnitude	Significance and Nature of Effect	Additional Mitigation	Residual Impact Magnitude	Residual Significance and Nature of Effect	Confidence Level
Construction							
1. Site area change from the existing landscape typology of agricultural grassland to hoarded site with construction compound, vehicular routes and plant machinery	Medium	Substantial	Intermediate Adverse	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area.	Moderate	Minor Adverse	Medium
2. Change to Landscape Character Area 11A: Calne Rolling Clay Lowland – replacement of arable farmland with construction site	Medium	Slight to Moderate	Minor Adverse	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area.	Slight	Neutral	High
3. Physical Landscape Resource and Habitat	Low-Medium	Substantial	Intermediate Adverse	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area.	Moderate	Minor Adverse	Medium
4. Viewpoint 1: Representative view for road users looking north into the Site from the B4005 that runs adjacent to the Site's southern boundary and on a similar AOD to the site. Site hoarding and construction compound, machinery and equipment clearly visible.	Medium	Substantial	Intermediate Adverse	Minimise construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	Moderate	Minor Adverse	Medium
5. Viewpoint 2: Representative View for road users from M4 Junction 16 exit slip road onto the B4005 southbound. Due to the elevated nature of the junction above the M4, the construction site is easily visible below to the east with only partial screening offered by the existing hedgerow and hedgerow trees.	Low-Medium	Substantial	Intermediate-Major Adverse	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	Moderate	Intermediate Adverse	Medium
6. Viewpoint 3: Representative View for road users from A3102 eastbound on approach to the M4 Junction 16 interchange roundabout. Due to the distance of the Viewpoint from site and the lower level of the site, the highway infrastructure blocks most of the view. Some of the taller trees and background hedgerows are glimpsed.	Low-Medium	Slight	Minor Adverse	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	Negligible	Neutral	High
7. Viewpoint 4: View for road users from B4005 heading west towards the Site having crossed the rail line. Due to the elevated position of the viewpoint, the eastern boundary of the Site is clearly visible, though the majority of the Site itself is screened by the hedgerow and trees along this boundary.	Medium	Moderate	Intermediate Adverse	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	Slight	Minor Adverse	Medium
8. Viewpoint 5: Open view from PRoW in agricultural field adjacent to Site. Hedgerow and trees on eastern boundary provide significant screening, particularly to the right of the view. Site level is similar to Viewpoint. Glimpses of B4005 to the left of the view possible.	Medium-High	Moderate	Minor Adverse	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	Slight	Neutral	Medium - Low

9. Viewpoint 6: Representative View for road users from the B4005 roundabout interchange with Wichel Way. A newly completed roundabout, the view looks west towards the site but due to the intervening rail line embankments, the site is not visible.	Low-Medium	Negligible	Neutral		Negligible	Neutral	High
10. Viewpoint 7: Representative View for road users from Wichel Way on the southern side of the M4 just before it crosses the Motorway. A newly completed road, the view looks west towards the Site but due to the intervening rail line embankments, the Site is not visible.	Medium	Negligible	Neutral		Negligible	Neutral	High
11. Viewpoint 8: The Viewpoint is elevated above the Rail line. A large, mature woodland block in the mid-ground screens views to the site. Pylons are visible above the treeline in the distance. If the plantation woodland is cropped, this may open views to the Proposed Development, but currently no view is possible.	Medium-High	Negligible	Neutral		Negligible	Neutral	Medium
12. Viewpoint 9: Due to intervening commercial buildings and M4 green infrastructure buffer planting, no views to the site are possible. Winter views may provide glimpsed or partially screened activity on site.	Low	Negligible	Neutral		Negligible	Neutral	Medium
13. Viewpoint 10: View at 1km distance from site for pedestrians crossing motorway on bridge path. M4 motorway dominates view with embankments and green infrastructure planting providing softening and screening. Minor glimpsed views of the site may be possible and would be more apparent in winter	Low-Medium	Slight	Minor <i>Adverse</i>	Minimise construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	Negligible	Neutral	Medium
14. Viewpoint 11: View at 1km distance from site for users of a PRow. Undulating topography, field hedgerows and mature trees, and farm buildings in mid-ground block views to the site. Glimpsed views may be possible in winter.	Medium - High	Slight	Neutral		Negligible	Neutral	Medium
15. Viewpoint 12: View from Hay Lane, within the North Wessex Downs AONB. The view is on the northbound road looking down towards the lower levels of the Calne Rolling Clay Lowland landscape with Swindon visible beyond. The Site is visible in the distance to the far left of the view.	Medium-High	Slight	Minor <i>Adverse</i>	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	Negligible	Neutral	Medium
16. Viewpoint 13: View at 3.2km from site on the White Horse Trail Long Distance Path, as it passes Bicknoll Castle, within North Wessex Downs AON. The heightened elevation of the viewpoint gives a vista over gently undulating countryside, with the site location nestled into the field pattern of hedgerows and trees.	High	Slight	Minor <i>Adverse</i>	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	Negligible	Neutral	Medium

Operation

1. Site area change from the existing landscape typology of	Medium	Substantial	Intermediate	Retain existing field boundaries and hedgerows.	Moderate	Minor <i>Beneficial</i>	Medium
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agricultural grassland to hard paved parking areas, associated services buildings and landscape.			Adverse	Enhancement of habitat and landscape periphery with tree and scrub planting. New habitat creation provided in east field.			
2. Change to Landscape Character Area 11A: Calne Rolling Clay Lowland – replacement of arable farmland with commercial premises.	Medium	Slight	Neutral	Retain existing field boundaries and hedgerows. Enhancement of habitat and landscape periphery with tree and scrub planting. New habitat creation provided in east field.	Negligible	Neutral	Medium
3. Physical Landscape Resource and Habitat	Low-Medium	Moderate	Intermediate	A biodiversity enhancement area will be created as part of the Proposed Development in the eastern field, which is enclosed by hedgerow and trees. A habitat creation management plan, designed by qualified ecologists, will be implemented and its longevity assured. Significant Biodiversity Net Gain will be achieved.	Moderate	Intermediate <i>Beneficial</i>	High
4. Viewpoint 1: Representative view for road users looking north into the Site from the B4005 that runs adjacent to the Site's southern boundary and on a similar AOD to the site. Site buildings and vehicular parking are visible, but landscape peripheral planting and internal planting soften the view and screen substantial areas	Medium	Moderate	Minor to Intermediate <i>Adverse</i>	Green roofs on buildings, SuDs landscape planting and trees / hedgerows in internal site areas further soften views of the vehicular parking and buildings. Controlled lighting systems and baffled fittings ensure lighting at night is muted and sympathetic.	Slight	Minor <i>Adverse</i>	High
5. Viewpoint 2: Representative View for road users from M4 Junction 16 exit slip road onto the B4005 southbound. Due to the elevated nature of the junction above the M4, the site is easily visible below to the east with softening and some screening offered by the existing hedgerow and hedgerow trees along with enhanced landscape planting.	Low-Medium	Moderate	Minor to Intermediate <i>Adverse</i>	Green roofs on buildings, SuDs landscape planting and trees / hedgerows in internal site areas further soften views of the vehicular parking and buildings. Controlled lighting systems and baffled fittings ensure lighting at night is muted and sympathetic.	Moderate	Minor <i>Adverse</i>	Medium
6. Viewpoint 3: Representative View for road users from A3102 eastbound on approach to the M4 Junction 16 interchange roundabout. Due to the distance of the Viewpoint from site and the lower level of the site, the highway infrastructure blocks most of the view. Landscape planting softens the glimpsed view.	Low-Medium	Slight	Minor <i>Adverse</i>	Green roofs on buildings, SuDs landscape planting and trees / hedgerows in internal site areas further soften views of the vehicular parking and buildings. Controlled lighting systems and baffled fittings ensure lighting at night is muted and sympathetic.	Negligible	Neutral	High
7. Viewpoint 4: View for road users from B4005 heading west towards the Site having crossed the rail line. Due to the elevated position of the viewpoint, the eastern boundary of the Site is clearly visible, though the majority of the Site itself is screened by the hedgerow and trees along this boundary. Enhanced planting along the east boundary and on access roundabout provides screening	Medium	Moderate	Intermediate <i>Adverse</i>	Green roofs on buildings, SuDs landscape planting and trees / hedgerows in internal site areas further soften views of the vehicular parking and buildings. Controlled lighting systems and baffled fittings ensure lighting at night is muted and sympathetic.	Slight	Minor <i>Adverse</i>	Medium
8. Viewpoint 5: Open view from PRow in agricultural field adjacent to Site. Hedgerow and trees on eastern boundary provide significant screening, particularly to the right of the view. Site level is similar to Viewpoint. Glimpses of B4005 to the left of the view possible. Perimeter landscape screens majority	Medium - High	Slight	Minor <i>Adverse</i>	Green roofs on buildings, SuDs landscape planting and trees / hedgerows in internal site areas further soften views of the vehicular parking and buildings. Controlled lighting systems and baffled fittings ensure lighting at night is muted and sympathetic.	Negligible	Neutral	Medium

of site elements.							
9. Viewpoint 6: Representative View for road users from the B4005 roundabout interchange with Wichel Way. A newly completed roundabout, the view looks west towards the site but due to the intervening rail line embankments, the site is not visible.	Low - Medium	Negligible	Neutral		Negligible	Neutral	High
10. Viewpoint 7: Representative View for road users from Wichel Way on the southern side of the M4 just before it crosses the Motorway. A newly completed road, the view looks west towards the Site but due to the intervening rail line embankments, the Site is not visible.	Medium	Negligible	Neutral		Negligible	Neutral	High
11. Viewpoint 8: The Viewpoint is elevated above the Rail line. A large, mature woodland block in the mid-ground screens views to the site. Pylons are visible above the treeline in the distance. If the plantation woodland is cropped, this may open views to the Proposed Development, but currently no view is possible.	Medium-High	Negligible	Neutral		Negligible	Neutral	Medium
12. Viewpoint 9: Due to intervening commercial buildings and M4 green infrastructure buffer planting, no views to the site are possible. Winter views may provide glimpsed or partially screened activity on site.	Low	Negligible	Neutral	Landscape trees and scrub to the site periphery provide additional softening and screening.	Negligible	Neutral	High
13. Viewpoint 10: View at 1km distance from site for pedestrians crossing motorway on bridge path. M4 motorway dominates view with embankments and green infrastructure planting providing softening and screening. Minor glimpsed views of the site may be possible and would be more apparent in winter	Low-Medium	Slight	Neutral	Green roofs to buildings and enhanced landscape periphery provide softening and screening	Negligible	Neutral	High
14. Viewpoint 11: View at 1km distance from site for users of a PRoW. Undulating topography, field hedgerows and mature trees, and farm buildings in mid-ground block views to the site. Glimpsed views may be possible in winter.	Medium - High	Slight	Neutral	Green roofs to buildings and enhanced landscape periphery provide softening and screening	Negligible	Neutral	Medium
15. Viewpoint 12: View from Hay Lane, within the North Wessex Downs AONB. The view is on the northbound road looking down towards the lower levels of the Calne Rolling Clay Lowland landscape with Swindon visible beyond. The Site is visible in the distance to the far left of the view.	Medium-High	Slight	Minor Adverse	Green roofs on buildings, SuDs landscape planting and trees / hedgerows in internal site areas further soften views of the vehicular parking and buildings. Controlled lighting systems and baffled fittings ensure lighting at night is muted and sympathetic.	Negligible	Neutral	Medium
16. Viewpoint 13: View at 3.2km from site on the White Horse Trail Long Distance Path, as it passes Bicknoll Castle, within North Wessex Downs AON. The heightened elevation of the viewpoint gives a vista over gently undulating countryside, with the site location nestled into the field pattern of hedgerows and trees.	High	Negligible	Neutral	Green roofs on buildings, SuDs landscape planting and trees / hedgerows in internal site areas further soften views of the vehicular parking and buildings. Controlled lighting systems and baffled fittings ensure lighting at night is muted and sympathetic.	Negligible	Neutral	Medium

Chapter 9: Hydrology, Flood Risk and Water

Environmental Statement: Volume 1

784-B048803

9.0 HYDROLOGY, FLOOD RISK AND WATER

9.1 INTRODUCTION

- 9.1.1 This chapter presents the approach and findings of the assessment of the effects of hydrology and flooding of the Proposed Development. The chapter sets out the methodology followed in undertaking the assessment and provides a review of the baseline features and resources of the Proposed Development site and surrounding area. The chapter presents the results of the impact assessment of the Proposed Development on the baseline features and resources in order to determine the magnitude of impact and significance of effects. Mitigation measures are proposed, where necessary, to minimise the impacts of the Proposed Development during both the construction and operation phase of the scheme. The expected residual effects of the proposals are then stated.
- 9.1.2 The hydrology and flood risk ES Chapter assesses the following potential impacts identified:
- Impact of flooding on local residents;
 - Impact on groundwater resources from pollution;
 - Impact on surface water bodies from contamination;
 - Impacts on existing flood zones; and
 - Impact on public drainage infrastructure.
- 9.1.3 This chapter is supported by the following appendices provided at **Volume 2** to this ES:
- Appendix 9.1: Flood Risk Assessment; and
 - Appendix 9.2: Sustainable Drainage Report.
- 9.1.4 A detailed description of the Proposed Development can be found in **Chapter 3: Description of Development**.
- 9.1.5 This ES Chapter has been prepared by Pell Frischmann. The Chapter has been prepared by Thomas Sturtridge BSc (Hons) MSc PIEMA and reviewed by Daniel Allum-Rooney BSc (Hons) MSc Drainage & Flood Risk Technical Director who are both experienced and competent in producing this assessment.

¹ UK Government (1990) Environmental Protection Act.

² UK Government (1991) Water Resources Act.

³ UK Government (1991) Water Industry Act.

⁴ UK Government. (1994). Land Drainage Act.

⁵ UK Government. (1995). The Environment Act.

9.2 METHODOLOGY AND SCOPE

Policy Background

- 9.2.1 In preparing this section of the ES, relevant national and local legislation and policy guidance documents have been consulted and presented. An overview of the applicable legislative framework is summarised as follows:
- Environmental Protection Act 1990¹ – Part IIA of the Act describes a regulatory role for local authorities in managing contaminated land and as of 2008, makes provision for improved control of pollution arising from certain industrial and other processes, re-enacting the provisions of the Control of Pollution Act 1974;
 - Water Resources Act 1991² – The Act sets out the regulatory restrictions on abstraction and compounding of water;
 - Water Industry Act 1991³ – Reinforces enactments regarding water supply and sewerage services;
 - Land Drainage Act 1994 (as amended)⁴ – The Act consolidates enactments where duties are placed on the IDB and local authorities regarding land drainage and includes additional environmental duties to the previous Land Drainage Act 1991;
 - The Environment Act 1995 (as amended)⁵ – The Act sets new standards for environmental management and presents the responsibilities of the Environment Agency pertaining to water pollution, flood defence and resource management;
 - The Water Framework Directive 2000/60/EC (was transposed into English law through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003), which were replaced in 2017 – those regulations are now retained EU law⁶. The WFD is designed to improve and integrate the way water bodies are managed. It effectively incorporates and/or supersedes all water related legislation that drives the existing consenting framework;
 - Water Act 2003 (as amended)⁷ – Formalises the Government’s commitment to the sustainable management and use of water resources and sets out measures for flood defence work in England and Wales;
 - Flood and Water Management Act 2010⁸ – This legislation responds to pressure to address the threats of flooding and water scarcity, which are both expected to increase with climate change. It recommends that Sustainable Drainage Systems (SuDS) should be the first choice for drainage for all new developments, and that the SuDS Approval Body within the LLFA have a duty to adopt SuDS (subject to approval);
 - Environment Act 2021⁹ – It make provisions about targets, plans and polices for improving the natural environment including water, wastewater, nature, and biodiversity.

⁶ European Union. (2000/60/EEC). Water Framework Directive – UK Government. (2017). Water Environment (England and Wales) Regulations.

⁷ UK Government. (2003). Water Act.

⁸ UK Government (2010) Flood and Water Management Act.

⁹ UK Government. (2021). Environment Act.

National Planning Policy Framework (NPPF)¹⁰

- 9.2.2 The revised NPPF was updated in September 2023 and outlines the Government’s planning policies for England.
- 9.2.3 Section 2 introduces the NPPF as a guideline which is a presumption in favour of sustainable development (Paragraph 11). In the context of flood risk and drainage, the Framework states that the planning system should aim to minimise vulnerability and deliver resilience to effects arising from climate change, such as increased flood risk and coastal change.
- 9.2.4 Therefore, it should seek to:
- Avoid inappropriate development in areas at high risk of flooding or where development is necessary, provide measures to minimise the flood risk;
 - Reduce risk from coastal change by avoiding development in vulnerable areas or adding to the impacts of physical change to the coast; and
 - Consider the long-term implications for flood risk, coastal change, and water supply.
- 9.2.5 Section 14 of the NPPF further covers how planning policy should meet the challenges of climate change, flooding, and coastal change.

Planning Practice Guidance (PPG)¹¹

- 9.2.6 Last updated in August 2022, the online-based PPG was introduced to support the NPPF. This guidance provides specific mention to flood risk and coastal change issues. Table 1 of the PPG defines Flood Zones whilst referring to the Environment Agency’s Flood Map for Planning.
- 9.2.7 Table 2 of the PPG defines the flood risk vulnerability classification of different land uses. Further guidance is also provided regarding appropriate allowances for climate change and ways to manage residual flood risk.

Local Planning Policy

Local Plan

- 9.2.8 The Wiltshire County Council Local Plan Core Strategy was adopted in January 2015¹², setting out the Council’s vision, aims, and objectives which will determine the future pattern of development within the council’s boundary.
- 9.2.9 Specifically, Chapter 1.10 which provides the overarching theme for the Local Plan including helping ‘build and protect resilient communities’ through aims including ‘tackling the causes and effects of climate change’.
- 9.2.10 The following lists provides a summary of the key policies related to the Water Environment;
- Core Policy 19: Spatial Strategy – Royal Wootton Bassett and Cricklade Community Area – This relates to enabling the delivery of sustainable developments within the borough, including the

requirement to assess and address the impact of climate change through mitigation and/or adaptation measures.

- Core Policy 52: Green Infrastructure – This policy relates to the requirement to retain and enhance existing on-site green infrastructure, provide management of green infrastructure and how the implementation of SuDS is encouraged within new and existing developments.
- Core Policy 67: Flood Risk – This policy is related to the requirement for development not to have a detrimental impact on the water environment including surface water, fluvial flooding, and groundwater. Furthermore, ensuring that all developments do not increase flood risk off-site and suitable mitigation measures are proposed within developments.
- Core Policy 68: Water Resources – This policy relates to the requirement for all new developments not to adversely impact the water environment within the County. Including the introduction of water efficiency within non-residential developments, and requirements to not prejudice the delivery of the actions and targets of the River Basin Management Plan or Catchment Flood Management Plan.

Wiltshire Council Strategic Flood Risk Assessment¹³

- 9.2.11 A Strategic Flood Risk Assessment (SFRA) for Wiltshire Council was published in May 2019, as appropriate supporting evidence for the draft Wiltshire Local Plan. The SFRA is to be used in decision making and to inform suitability of future development when considering policies for the long-term management of flood risk.
- 9.2.12 The SFRA provides a summary of flood risk within the area and provides an assessment for the sequential test for the suitability of development. This can be used to inform risk posed to the site from flooding.

Wiltshire Council Preliminary Flood Risk Assessment¹⁴

- 9.2.13 The Wiltshire Council Preliminary Flood Risk Assessment (PFRA), published in June 2011 provides a high-level overview of flood risk across the council boundary. It considers past flooding incidents, best available information, and possible future flood risk from local sources. These include surface water runoff, groundwater, ordinary watercourses and flooding from canals and small waterbodies.
- 9.2.14 The PFRA is prepared to meet the duties required of Wiltshire Council as Lead Local Flood Authority as per the Flood Risk Regulations (2009).
- 9.2.15 It provides valuable information on historic flood events and local flood risk issues to inform the risk to the site as well as impacts it may have elsewhere.

Wiltshire Local Flood Risk Management Strategy¹⁵

- 9.2.16 The Wiltshire Local Flood Risk Management Strategy (LFRMS) was produced in November 2014 to meet the requirements placed on Wiltshire Council as the Lead Local Flood Authority to comply with Section 9 of the Flood and Water Management Act 2010 and provides a framework for meeting their

¹⁰ MHCLG (2023). National Planning Policy Framework. Ministry of Housing Communities and Local Government.

¹¹ UK Government. (2022). Planning Practice Guidance.

¹² Wiltshire County Council. (2015). Local Plan.

¹³ Wiltshire County Council. (2019). Strategic Flood Risk Assessment.

¹⁴ Wiltshire County Council. (2011). Preliminary Flood Risk Assessment.

¹⁵ Wiltshire County Council. (2014). Local Flood Risk Management Strategy.

requirements to develop, maintain, apply, and monitor a local strategy for flood risk management and how the council aims to achieve this.

Wiltshire Surface Water Management Plan¹⁶

- 9.2.17 The Wiltshire Surface Water Management Plan (SWMP) was published in November 2011 to understand the flood risks that can arise from local flooding, identifying where flood risk issues are, what impact they have, how they can be managed, as well as providing a full history of the plan area. This will provide a baseline for Wiltshire Council to aim to manage and improve surface water flood risks within the council area.

Swindon Surface Water Drainage Strategy Guidance¹⁷

- 9.2.18 The Swindon Surface Water Drainage Strategy Guidance was published to provide a concise list of requirements for surface water management within Swindon Borough. It includes information on which storm events SuDS features are required to be designed to, along with the preference for SuDS to be incorporated within developments.

Thames Catchment Flood Management Plan¹⁸

- 9.2.19 The Thames Catchment Flood Management Plan (CFMP) was published in December 2009 by the Environment Agency. The CFMP aims to help the Environment Agency and local councils to understand the scale and extent of flooding now and in the future, whilst also setting policies for managing flood risk within the catchment.
- 9.2.20 The CFMP should be used to inform planning and decision making by key stakeholders including; the Environment Agency, local authorities, IDB's, water companies and utility providers, landowners, and the general public. The CFMP also aims to promote more sustainable approaches to managing flood risk.

Thames River Basin Management Plan¹⁹

- 9.2.21 The Thames River Basin District Flood Risk Management Plan (RBPM) was prepared by the Environment Agency and published in December 2022. The purpose of this RBPM is to provide a framework for protecting and enhancing the benefits provided by the water environment.

EIA Screening and Scoping Assessment Stage

- 9.2.22 A scoping opinion was not sought; however, an EIA screening opinion was received, which is provided in **Appendix 1.2: Screening Opinion Decision Notice**.
- 9.2.23 In relation to hydrology and flooding the EIA screening opinion states that as the site is larger than 1ha, a Flood Risk Assessment (FRA) is required to be produced, alongside a drainage strategy that focuses on the use of SuDS throughout the development. The mitigation measures provided within the FRA and drainage strategy should ensure that there will be no significant impacts associated with hydrology and flood risk.

Assessment Methodology

Study Area

- 9.2.24 Several unnamed Ordinary Watercourses are found along the northern, eastern, and southern boundaries of the site, as confirmed by mapping. A watercourse map is included as part of the accompanying **Appendix 9.1: Flood Risk Assessment**.
- 9.2.25 By their nature, any impact on these watercourses would extend as far as their overall catchment as indirect effects may be encountered both upstream and downstream. The study area will also extend to the receiving Sewage Treatment Works (STW) as foul flows from the Proposed Development could indirectly affect the operation, discharge etc. from this infrastructure.
- 9.2.26 The assessment covers impacts on surface water bodies, groundwater, flood risk, surface and foul water disposal and potable water supply.

Receptor Sensitivity

- 9.2.27 A FRA (provided in **Appendix 9.1**) has been carried out in accordance with the guidance of the National Planning Policy Framework and associated Planning Practice Guidance. It also includes reference to updated guidance published by the Environment Agency on climate change allowances²⁰ that should be used as part of an FRA.
- 9.2.28 Overarching guidance related to surface water drainage includes the Non-Statutory Technical Standard for Sustainable Drainage Systems, Swindon Borough Council Surface Water Drainage Strategy Guidance, and the CIRIA SuDS Manual C753²¹.
- 9.2.29 As the surface water from the site is likely to be discharged via the watercourses surrounding the site which drain into the wider network within Swindon Borough Council, and Wiltshire County Council not having documentation/guidance on surface water drainage, guidance has been considered on surface water drainage from Swindon Borough Council.
- 9.2.30 With reference to this ES, the significance of each potential impact identified will be measured through a qualitative assessment, combining the sensitivity of each receptor and the magnitude of each impact in a matrix.
- 9.2.31 Where possible, quantitative measures of a resource or receptor have been used to inform the receptor sensitivity classification, otherwise expert judgment, observations, and available information have been used to make an informed decision.
- 9.2.32 The sensitivity classifications being used are summarised in Table 9.1.

¹⁶ Wiltshire County Council. (2011). Surface Water Management Plan.

¹⁷ Swindon Borough Council. (n.d.). Surface Water Drainage Strategy Guidance.

¹⁸ Environmental Agency. (2009). Thames Catchment Flood Management Plan (CEMP).

¹⁹ Environment Agency. (2022). Thames River Basin Management Plan.

²⁰ Environment Agency (2022) Flood Risk Assessment; Climate Change Allowances.

²¹ CIRIA. (2015). The SuDS Manual CIRIA Report C753.

Table 9.1. Receptor Sensitivity Definitions

Sensitivity	Description	Quantitative Measures
Very High	Very high importance and rarity, receptor is defined on an international scale or importance with very little opportunity for substitution	High overall WFD classification Principal Aquifer Source Protection Zone I Flood Zone 3b Local Population
High	Receptor defined on a national scale or having national importance, with limited potential for substitution	Good overall WDF classification Secondary A Aquifer including Groundwater. Bathing Water Source Protection Zone II Flood Zone 3a Existing Residential Properties
Medium	Medium importance and/or rarity, defined as having a regional importance with some potential for substitution or replication.	Moderate overall WFD classification Secondary B Aquifer Source Protection Zone III Flood Zone 2 Existing Commercial/Retail Property
Low	Low rarity and importance defined on a local scale, or a receptor that could be substituted without concern.	Poor or Bad overall WFD classification Unproductive Aquifer Source Protection Zone of Special Interest Undeveloped land
Negligible	Receptor of very low importance or rarity that may not require substitution.	Flood Zone 1

Effect Magnitude

9.2.33 Each impact identified as part of the technical assessment can be quantified in terms of its magnitude of impact as per the definitions in Table 9.2. It should be noted that the magnitude of impact can be either beneficial or adverse.

Table 9.2. Magnitude of Impact Definitions

Magnitude	Description
Major	Substantial change in defining characteristics of resources, including quality and/or extent. Impacts are measurable and likely to change the integrity, viability, or operation of a resource.
Moderate	Measurable change in at least one key feature or defining element of a resource, such as change to quality or scale. Impacts may have potential to affect the overall integrity of the resource.
Minor	Measurable change to an attribute that may not affect the overall classification or definition of the feature. Impacts are unlikely to affect the overall integrity or nature of the resource.
Negligible	Small change to a key characteristic may be predicted but unlikely to be observed or result in measurable change to the quality or extent of the resource, or no discernable change.

Effect Significance

9.2.34 The receptor sensitivity and impact magnitude are then combined within the significance matrix to define the significance of effect as per Table 9.3.

Table 9.3. Significance Matrix

		Impact Magnitude			
		Major	Moderate	Minor	Negligible
Receptor Sensitivity	Very High	Substantial	Substantial	Moderate	Minor
	High	Substantial	Moderate	Moderate	Minor
	Medium	Moderate	Moderate	Minor	Minor
	Low	Minor	Minor	Minor	Neutral
	Negligible	Neutral	Neutral	Neutral	Neutral

9.2.35 Potential impacts and significant effects will be considered as either positive or negative. In the context of this ES chapter, a ‘significant effect’ is considered one that is assessed as having ‘substantial’ or ‘moderate’ significance, as defined in Table 9.4.

Table 9.4. Definitions of Significance

Significance	Description
Substantial	These effects are usually associated with significant changes to resources of an international importance or attributed to large-scale impacts on a nationally significant resource.
Moderate	These effects may be important and require mitigation and may be key in the decision-making process. The cumulative impact of several effects of this significance on a receptor may influence decision-making if they lead to an increase in the overall impact.
Minor	These effects may be raised as important on a local scale but are unlikely to be critical in the decision-making process but may be important factors in enhancing the subsequent design and mitigation of the project.
Neutral	No discernible effects, or those the scale of which can't be accurately measured. Impacts likely to be within the normal limits of variation or within the margin of error of assessment methods.

9.2.36 In accordance with the completed identified potential impacts, Table 9.5, provides a summary of the receptors identified as part of the scope of this Chapter and their sensitivity as per the definitions above.

Table 9.5. Summary of Receptors & Their Sensitivity

Receptor	Sensitivity
Local Residents	Very High
Plant Equipment	Medium
Swindon Sewage Treatment Works	Low
Existing Undeveloped Land	Low
Downstream Developments	Low
Groundwater Resources	Low
Surface Water Bodies	Low
Flood Zones	Negligible
Public Drainage Infrastructure	Medium

Limitations of the Assessment

- 9.2.37 The scope of the assessment has been based upon a review of available information within the study area to identify the baseline conditions and development receptors. This has been supported by detailed assessments where necessary and is based on the best data available at the time of production.
- 9.2.38 The Applicant has submitted a pre-development enquiry to Thames Water in respect of a strategic solution to accommodate foul water disposal from the Proposed Development. It is likely that a viable solution is deliverable. If capacity is not available within the existing network, any improvement works carried out will meet with Thames Water’s obligations under the Water Industry Act (1991) to provide such a service, within any environmental permitted limits, thus negating any impact on the wider water environment. As part of this pre-development enquiry, Thames Water have confirmed there is sufficient capacity within their fresh water supply network to serve the Proposed Development.
- 9.2.39 Furthermore, whilst the principles of the drainage strategy prepared for each element of the site are compliant with current best practice and guidance, the nature of an outline application means that these strategies may be subject to change during detailed design at reserved matters to reflect any updated design requirements.

Consultation

- 9.2.40 Consultation has been ongoing with key stakeholders since project inception regarding various matters related to flood risk, drainage, hydrology, and water resources. A summary of the consultation is provided within Table 9.6. It should be noted that when referencing the Lead Local Flood Authority, this is Wiltshire County Council.

Table 9.6. Water Environment Consultation Log

Consultee	Type of Consultation	Consultee Response
Environment Agency	Request for Information	Site is wholly within Flood Zone 1
Lead Local Flood Authority	Request for Information	Provided information on how to access flood risk data, and information on pre-application services.
Thames Water	Pre-Development Enquiry	Water supply response received, confirming capacity within system for development. Foul water response not received as of 08/09/2023

9.3 BASELINE ENVIRONMENT**Existing baseline and Identification of Key Receptors**

- 9.3.1 This section provides a breakdown of the baseline conditions currently found at the site, including receptors and how these receptors interact with the site and the resultant drainage and flood risk constraints. Some of the key receptor are as follows;
- Swindon STW;
 - Local Residents;
 - Construction Plant & Equipment;
 - Surface Water Bodies;
 - Downstream Developments;
 - Flood Zones;
 - Local Sewers;
 - Groundwater Resources;
 - Public Drainage Infrastructure; and
 - Unnamed Watercourses.

Existing Conditions

- 9.3.2 The Application site is predominantly given over to open agricultural land. There are no large watercourses within the site boundary.
- 9.3.3 Around the site boundary, there are several unnamed watercourses and drains, these are likely to serve a land drainage function.
- 9.3.4 As the majority of the site contains no obvious areas of hardstanding, it is considered that the site is not being currently served by existing positive drainage infrastructure, and as such, the entire area is subject to a natural regime of surface water runoff, evapotranspiration, and infiltration where ground conditions permit.

Groundwater Receptors

- 9.3.5 Aquifer designations within the superficial deposits covering the development site are categorised as unproductive aquifers. The bedrock geology is also designated as an Unproductive aquifer. The site does not fall within a Source Protection Zone (SPZ) with the closest located approximately 1.6km to the west of the Site.
- 9.3.6 DEFRA's MagicMap is unable to provide information on the groundwater vulnerability to pollution due to area of the site having both the bedrock and superficial aquifer designations classified as Unproductive.
- 9.3.7 The site falls within an area shown to have a medium priority for phosphate issues under the Countryside Stewardship Agreements as part of the England Rural Development programme. This aims to help improve water quality in areas identified to meet WFD targets.
- 9.3.8 The site does not fall within the boundary of the nearby 'Corallian Limestone (Calne to Swindon)' ground water body as part of the Corallian Limestone – Calne to Swindon Operational Catchment.
- 9.3.9 Due to the Unproductive nature of the bedrock and superficial geology aquifers, along with being removed from a SPZ, and ground water bodies, groundwater is considered to be a low sensitivity receptor. It's deep presence and limited potential to be connected to wider aquifers and watercourses means that any impact on this receptor is likely to remain localised.

Flood Extents

- 9.3.10 The Flood Map for Planning is a resource prepared by the Environment Agency to identify areas that are at risk of flooding from rivers and the sea. This mapping shows the Site to be wholly within Flood Zone 1 (Low Probability), and so at low risk of flooding from fluvial and tidal sources.
- 9.3.11 The nearest extent of Flood Zone 2 and 3 (Medium and High Probability) is found approximately 1.2km east of the site.
- 9.3.12 Further assessment of the flood risks from other sources is discussed within the Flood Risk Assessment provided as **Appendix 9.1**.
- 9.3.13 The site does not fall within a Critical Drainage Area (CDA).
- 9.3.14 Therefore, the associated flood extents are considered to be a low sensitivity receptor.

WFD Water Bodies

- 9.3.15 The unnamed watercourse found surrounding the site boundary falls within the ‘Ray (Wiltshire) source to Lydiard Brook Water Body’, with topographies showing these watercourses likely outfall to the River Ray downstream.
- 9.3.16 The River Ray is found approximately 3.2km to the east of the site. This Main River forms the main outfall location for the Swindon STW proposed to treat foul flows from the development.
- 9.3.17 The WFD applies to all designated Main Rivers including tributaries and waterways. The outfall for treated effluent from the STW is understood to discharge into the River Ray, and so would outfall into the ‘Ray (Wiltshire) source to Lydiard Brook’ water body (waterbody ID: GB106039023320). This water body has a current ecological status of ‘Moderate’.
- 9.3.18 One of the major reasons for not achieving good (RNAG) status for this water body including both intermittent and continuous sewage discharge from wastewater treatment.
- 9.3.19 A summary of the relevant information from the Catchment Data Explorer is provided within Table 9.7.

Table 9.7. Local Watercourses Status Classifications

Watercourse	Overall Status					
	2013	2014	2015	2016	2019	2022
Ray (Wiltshire) source to Lydiard Brook - Overall	Poor	Poor	Poor	Poor	Poor	Moderate
<i>Ecological</i>	Poor	Poor	Poor	Poor	Poor	Moderate
<i>Chemical</i>	Fail	Fail	Good	Good	Fail	Does not require assessment

Sewerage Infrastructure

- 9.3.20 It is understood the site falls immediately outside of the currently defined catchment of the Swindon STW; it is likely the site can be absorbed into the operational catchment of the STW if capacity is found.
- 9.3.21 A pre-development enquiry has been submitted to Thames Water to ascertain capacity within the existing public sewage network to convey and treat anticipated flows from the new development.

Water Supply

- 9.3.22 Potable water supply in this area is provided by Thames Water with the majority of the supply coming from groundwater abstraction in the Cotswold’s (supported by a series of large banded storage reservoirs around Oxford).

- 9.3.23 Within Swindon and the Southwest Oxford region, Thames Water are predicting a small water supply demand surplus under dry conditions but has predicted a supply demand deficit under peak week conditions.

- 9.3.24 As a result of a pre-development enquiry, Thames Water have confirmed suitable capacity within their clean water supply network, to supply water to the Proposed Development.

Future baseline

- 9.3.25 The future baseline considers how potential flood risk and river dynamics will be affected by climate change impacts on rainfall intensity, peak river flow, and sea level change as determined in the NPPF. As the FRA and included information considers the impact of climate change, it is typically considered a long-term future baseline potentially occurring throughout the anticipated design life of the development.
- 9.3.26 In a broader context, the future baseline scenario should consider other changes to the water environment such as changes to water quality, foul sewerage infrastructure and water supply demand. Under the current legal framework, all water companies have a legal duty to provide and maintain a standard of drainage fit-for-purpose to include future changes in demand, water usage etc. and therefore the future baseline would operate on a similar scenario to the current situation.

9.4 MITIGATION WITHIN THE SUBMITTED DESIGN**Design**

- 9.4.1 As part of developing the masterplan for the scheme, there are several embedded mitigation measures related to flood risk and drainage that were secured through early involvement by Pell Frischmann.
- 9.4.2 Flood Zones and climate change floodplain extents were identified and confirmed the site is generally at low risk of flooding from fluvial, tidal, and pluvial sources. As such, the Proposed Development is sequentially preferable, avoiding development within areas prone to flooding. All development is placed within Flood Zone 1.
- 9.4.3 As such, this is considered inherent mitigation for the risk of flooding posed to the area.
- 9.4.4 The Sustainable Drainage Report (**Appendix 9.2**) has, from project inception identified a suitable strategy for the management of surface water for the Proposed Development. It sought to outline existing surface watersheds and retain these where possible to avoid localised issues with catchment transfer.
- 9.4.5 From these catchments, a suitable method of surface water disposal was identified, comprising a positive outfall to an appropriate receptor, together with a suitable maximum allowable discharge.
- 9.4.6 Any restricted discharge rates are equivalent to the pre-development greenfield QBAR rate and will be used to restrict runoff for all storm events, including appropriate increases in rainfall intensity to allow for the impact of climate change.
- 9.4.7 Within the submitted scheme, suitable space has been allocated to allow for the accommodation of strategic sustainable drainage features, such as ponds, basins and swales that will accommodate the

- additional runoff generated by the Proposed Development, while discharging via outfall to nearby watercourses at the previously mentioned low rate.
- 9.4.8 Thames Water has been engaged throughout the project to ensure suitable foul water drainage from the Proposed Development. Engineers from Pell Frischmann have worked with Thames Water to identify appropriate points of connection to the public sewerage network. A final response to the consultation regarding capacity and in-principal agreement to points of connection remains outstanding.
- 9.4.9 However, Thames Water are required to provide upgrades to their system and to the receiving STW to provide sufficient capacity for the anticipated flows from the development. With this in place, a suitable solution will be provided to ensure no adverse environmental impacts associated with the Proposed Development.
- 9.4.10 The inclusion of a sustainable foul and surface water drainage strategy within the parameters of the Proposed Development is considered embedded mitigation and therefore the potential effects are assessed with this in place.
- 9.4.11 It is anticipated that as part of the construction process a Construction Environment Management Plan (CEMP) will be produced in accordance with the relevant guidelines to manage and mitigate any environmental impacts the development might have as part of the construction and operation phases.
- 9.4.12 A CEMP should be developed to demonstrate the proposed environmental management practice that will be required of contractors employed to undertake the construction work. This will be controlled by planning conditions. The CEMP should include several key elements as set out below.

9.5 LIKELY SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE SCHEME

Construction Phase

Changes to Natural Drainage Regime

- 9.5.1 During the construction phase, heavy machinery will be used across the development site, potentially resulting in the compaction of soil. This can reduce infiltration rates and has the potential to increase both the volume and rate of runoff into the local watercourses and sewers. This may result in short term changes to flow patterns and subsequently, increase flood risk further downstream. The movement of heavy plant, machinery and site vehicles should be managed as part of the CEMP.
- 9.5.2 Uncontrolled increases in the rate and volume of surface water runoff from the development site could be considered a minor adverse impact due to its potential to locally alter flood risk. There are few receptors immediately downstream that may be affected by an increase in runoff, namely the existing floodplains in the area and immediately neighbouring land. Most of the land is agricultural and open green space and therefore the receptors (existing undeveloped land) would be of **‘Low’ sensitivity**. The resulting effect would therefore be of **minor adverse** significance on undeveloped land. This effect would be considered indirect, would occur over the long term and be temporary.

- 9.5.3 Changes to flow regime of smaller watercourses in the area is considered to be a negligible impact these are largely agricultural and serve land drainage functions and as such likely experience substantial fluctuations in flow rates throughout the year, often experiencing periods of high flows in wetter periods and periods of drying. A **negligible impact** on **low sensitivity** receptors (local watercourses) would be considered a **neutral** significance effect which is not significant in EIA terms. The effect would be direct, occur over the long term and be temporary in nature.

Pollution Risk

- 9.5.4 The CEMP will be in place to guide contractors to follow best practice principles. To mitigate the potential pollution risks during the construction phase, simple measures can be employed on site and adopted as part of the site procedures and CEMP.
- 9.5.5 According to the CIRIA guidance on Control of Water Pollution, the most common instance of water pollution from construction sites is from suspended solids. Possible sources of suspended solids from the construction of the Proposed Development include:
- Earthworks and excavations;
 - Exposed ground, including material stockpiles;
 - Plant and wheel washing;
 - Build-up of dust and mud on haul roads;
 - Pumping of contaminated surface waters or groundwaters accumulate on the development site; and
 - Disturbance of riverbeds and/or banks.
- 9.5.6 Construction activity will also likely include the removal of topsoil and moving and storing earth within the development site boundary, resulting in volumes of unconsolidated material at the surface. Surface water runoff can erode these stockpiles and transport the sediment to the local watercourses. Indirect impacts may occur further downstream depending on the volume of sediment released, although its likely to magnitude would diminish further away from the development site.
- 9.5.7 Other instances of water pollution can occur from concrete and cement products, hydrocarbons, sewage, metals and other pollutants and hazardous materials generated during construction. These substances can enter the water environment through intrusive earthworks, leaks or spills and routine operations including vehicle and plant washing. The potentially hazardous nature of these types of pollutants means that their impact magnitude can be defined as **moderate adverse**.
- 9.5.8 Further pollutant hazards may come from the uncontrolled release of substances as general waste, solvents, cleaning agents, paints, and other chemicals. However, it is unlikely that bulk quantities of these substances would be present on the construction site, thus reducing the effect of their release.
- 9.5.9 The local watercourses are considered to have a **low sensitivity** to potential changes, therefore prior to mitigation, any of the potential pollutants described above that may enter them would be defined as having **minor adverse** effects without mitigation. The effect would be direct, occur in the short term and be permanent in nature due to the long-term impacts arising from watercourse pollution.

- 9.5.10 In the event that pollutants or contaminants enter the groundwater supply via leaching through the ground, then there would be a **moderate adverse** impact on the **low sensitivity** receptor, and therefore be classified as a **minor adverse** effect which is not significance in EIA terms. The effect would be direct, occurring the short term and be temporary in nature.
- 9.5.11 A pollution incident response plan should be prepared as part of the CEMP to detail measures taken in the event of leaks or spills of any pollutant stored on site.

Flood Risk Impacts

- 9.5.12 The development site is entirely within Flood Zone 1 and so the site is at low risk from flooding both rivers and the sea. All other sources of flood risk assessed as part of the FRA are all concluded to pose a low risk to the site.
- 9.5.13 Without mitigation, there is likely to be a **minor adverse** impact on **medium sensitivity** receptors such as the construction plant, machinery, and temporary buildings, resulting an effect of **minor adverse** significance which is not significant in EIA terms. This effect would be direct, short-term and temporary in nature.

Operational Phase

- 9.5.14 During the operational phase of the development, the major impact will be an increase in surface water runoff due to the large areas of roofing and hard standing within the Proposed Development compared to its existing greenfield runoff.

Impact on Runoff Quantity

- 9.5.15 As part of master planning the Proposed Development, embedded mitigation is incorporated within the design through the inclusion of various SuDS components, including strategic attenuation features in line with the recommendations set out in the Sustainable Drainage Report (**Appendix 9.2**).
- 9.5.16 The overarching aim of the surface water drainage strategy set out for the Proposed Development is to adhere to the 4 pillars of good SuDS design set out in the CIRIA SuDS Manual. Discharge from the Proposed Development will be restricted to a low-rate equivalent to the pre-development greenfield QBAR rate. This restricted rate will apply for all storm events up to and including the 100-year storm, with a 40% increase in rainfall intensity to all for the predicted future effects of climate change.
- 9.5.17 The strategy has followed the hierarchy of discharge laid out in multiple guidance documents, including policy from Wiltshire Council within the Local Plan, and surface water drainage guidance from Swindon Borough Council. As noted, before, infiltration is unlikely to be possible and so a positive connection to nearby watercourses is proposed, with a restricted discharge rate.
- 9.5.18 These embedded mitigation measures will ensure no adverse flood risk impacts downstream resulting from a greater rate and volume of water entering the watercourse and may provide a beneficial impact by controlling runoff from substantial areas of the catchments. Whilst it cannot prevent flooding entirely, it may contribute to a **minor beneficial** impact on a **low sensitivity** receptor of downstream developments. The effect would be indirect, occur in the long-term and be permanent in nature.

Impact on Runoff Quality

- 9.5.19 A second pillar of good SuDS design includes improving water quality. Using measures like the ones proposed, including swales, basins and ponds allowing for the deposition and trapping of sediment and particulate matter form urban runoff, with the periods of attenuation allowing for biological and natural breakdown of hydrocarbons and other soluble pollutants.
- 9.5.20 A lorry park, motorway service station and refuelling facility, such as the one proposed, is classified as having a ‘High’ pollution hazard level in the CIRIA SuDS Manual, with high indices for total suspended solids, metals and hydrocarbons, and therefore runoff from these areas will require suitable treatment prior to discharge.
- 9.5.21 The parking areas are proposed to comprise permeable paving across all areas, that will act to manage and intercept runoff from these areas, allowing it to percolate through the surface into the sub-base before being transferred by a swale network towards detention basins. The basins will store the additional volume of runoff prior to discharge at the agreed low rate.
- 9.5.22 In accordance with the SuDS Manual Simple Index Approach for assessing pollution prevention, the mitigation index for each pollutant has been summarised in Table 9.8 below, including the factored index for secondary and tertiary treatment stages. To meet the requirements of the simple index approach, the total mitigation index should exceed the pollution index for each measure.

Table 9.8. SuDS Mitigation Indices (from CIRIA SuDS Manual)

SuDS Component	Mitigation Indices		
	Total Suspended Solids	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7
Swales	0.5	0.6	0.6
Detention Basin	0.5	0.5	0.5
SuDS Mitigation Calculation	0.7 + 0.5(0.5) + 0.5(0.5)	0.6 + 0.6(0.5) + 0.5(0.5)	0.7 + 0.5(0.5) + 0.5(0.5)
SuDS Mitigation Index	>0.95	>0.95	>0.95
Land Use Pollution Index	0.8	0.8	0.8

- 9.5.23 This demonstrates that the site has sufficient levels of treatment available for the uses proposed, although a separate solution will likely be provided for the refuelling area, which can be isolated and shut-off in the event on a leak or spillage.
- 9.5.24 Furthermore, the site in its current condition has agricultural uses, which likely result in the use and potential release of fertilisers and other nutrient-rich runoff into the local watercourses. Cessation of

this activity as a result of development would lead to the reduction of such nutrients entering the water environment.

- 9.5.25 Overall, the Proposed Development would be considered to have a **minor beneficial** impact on a **low sensitivity** receptor. This equates to a **minor beneficial** effect that would be direct, occur in the medium-term and be permanent in nature.

Flood Risk Impacts

- 9.5.26 The development site is within Flood Zone 1, with areas of Flood Zones 2 and 3 found to the northwest and southwest far removed from the site boundary, and so the site is considered at low risk of flooding from fluvial and tidal sources.

- 9.5.27 The risk of flooding from surface water for the site is considered to be low. Whilst mapping shows several isolated areas of low risk within the site boundary, these are associated with localised topographical depressions and as such there is a **negligible impact** on a **low sensitivity** receptor, equating to an effect of **neutral significance** which is not significant in EIA terms. This effect would be direct, occurring in the long term and be permanent in nature. As such, the risk is considered negligible once development starts.

Foul Sewerage

- 9.5.28 The development site is located within the foul drainage catchment of Swindon Sewage Treatment Works, owned, and operated by Thames Water. Swindon STW discharges treated effluent via the River Ray.
- 9.5.29 Operating under normal conditions and within permitted limits for quality of effluent, the STW would be considered of **low sensitivity** for foul flows and the **moderate adverse** impact of conveying additional flow to it would equate to a **minor adverse** effect which is not significant in EIA terms. This would be indirect, occur in the medium term and be permanent in nature.

Water Supply

- 9.5.30 During the operation phase, the Proposed Development will generate a water supply demand for the HGV park and motorway service station aspect. As previously mentioned, overall Thames Water supply water to the area and currently anticipate a surplus within the region within the catchment area. Much of their supply is derived from groundwater abstraction. A small deficit has been predicted as part of Peak Week Calculations.
- 9.5.31 Network reinforcements may be required to supply infrastructure in the area, but it is anticipated that supply can be accommodated in a sustainable way.
- 9.5.32 Therefore, it is considered a **minor adverse** impact on a **low sensitivity** receptor, resulting in a **minor adverse effect** which is not significant in EIA terms. Any effect would be indirect, occur in the long term and be permanent.

9.6 ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES

Construction Phase

Changes to Natural Drainage Regime

- 9.6.1 To reduce the potential for large machinery to compact soil in an uncontrolled manner across the construction site resulting in an increase in the rate and volume of surface water, the movements of heavy plant, machinery and site vehicles should be managed as part of the CEMP, for which the principal contractor will be responsible. Creating designated pathways and haul roads along high-trafficked routes will minimise the impact on soil compaction and surface disturbance and reduce the overall area affected.
- 9.6.2 To prevent localised flooding during the construction phase, a temporary surface water management system should be put in place and enforced by the CEMP at the outset of construction activity. This would include swales and basins around any compounds to provide temporary on-site attenuation. This enabling works package should also priorities formation of the drainage features so these are installed and operation as early as possible.

Pollution Risk

- 9.6.3 The CEMP will be in place to guide contractors to follow best practice principles. To mitigate the potential pollution risks during the construction phase, simple measures can be employed on site and adopted as part of the site procedures and CEMP.
- 9.6.4 During construction of the enabling infrastructure, the haul roads will be kept clear of mud deposits and pedestrian routes will be set up and maintained. Haul roads should be damped down during dry and windy periods to minimise dust. A road sweeper will also be employed at regular intervals to keep the adjacent public roads clear of mud.
- 9.6.5 To reduce the potential impact of leaks and spills of oil, fuel and other contaminants from plant and machinery, machines should be checked for signs of wear and tear on a regular basis. Vehicle washdown areas should be bunded and runoff routed through interceptors. If oils or fuels are to be stored in bulk quantities on the Proposed Development site, the storage facilities will comply with the Environment Agency's Pollution Prevention Guidance Note 2²².
- 9.6.6 Refuelling facilities will comply with Pollution Prevention Guidance Note 7, with regular testing of the storage tanks and pipes and all refuelling activities taking place over an impermeable area which will drain off through an oil separator.
- 9.6.7 Any wastewater from the washing down of ready-mix concrete lorries or from the production of concrete on site will be carried out in a designated area where wastewater is unable to enter and surface water environment without being treated first.

Flood Risk Impacts

- 9.6.8 As discussed, the Development Site is generally at low risk of flooding from rivers and watercourses. Localised flood risk issues may occur near the watercourses, so it is recommended that construction

²² DEFRA. (2016). Pollution Prevention Guidance Note 2.

compounds, material stockpiles, car parks, site offices and other structures are positioned away from the banks of watercourses wherever possible.

9.6.9 The CEMP should use this data to prepare suitable emergency and contingency procedures that will be engaged if flooding is predicted, expected, or occurring. The principle aim would be to protect human health and safety by ensuring no activity is taking place in areas where water is collected on the surface at depth, including trenches and excavated areas. Subsequent measures should look to protect property (plant, machinery, and materials) to prevent damage and pollution of the water environment through the uncontrolled release of contaminants.

9.6.10 As part of site inductions and training, construction staff should be advised on how to react during a flood event and be aware of the elevated risk of groundwater emergence so they can plan and prepare accordingly.

Operational Phase

Impact on Runoff Quantity and Quality

9.6.11 The potential environmental impacts on the water environment from runoff during the operational phase have been addressed via the embedded mitigation of the surface water drainage strategy and therefore no further mitigation is necessary. The mitigation will be secured through implementation of detailed design in accordance with relevant parameter plans.

Flood Risk Impacts

9.6.12 The surface water drainage strategy will also provide some management and control of flows within the watercourses around the site boundary, reducing the potential flood risk from these sources. Any new culverts, crossings or other structures should be designed in such a way as to minimise the risk of blockage and offer a design that provides ease of maintenance. For all new structures, an appropriate body should be identified for the ownership and maintenance of these assets to ensure ongoing suitable maintenance activities.

9.6.13 There is no specific flood risk mitigation identified as part of the FRA, beyond best practice regarding the management of overland flows. The mitigation will be secured through appropriate planning conditions related to compliance with the recommendations of the FRA at the detailed design stage.

Foul Sewerage

9.6.14 Thames Water are currently actively engaged in an appraisal process to identify the most effective way of ensuring adequate wastewater treatment capacity to serve the Proposed Development.

9.6.15 Any strategic solution for wastewater treatment implemented by Thames Water will be done in such a way so that it manages, and where possible reduces the impact of treated effluent discharge on the receiving waterbodies and will need to be completed in line with the sewerage undertaker's obligations as set out in the Water Industry Act 1991.

9.7 ASSESSMENT SUMMARY AND LIKELY SIGNIFICANT RESIDUAL ENVIRONMENTAL EFFECTS

9.7.1 Table 9.9 below provides an overview of the identified impacts, the sensitivity of the receptor, impact magnitude and significance of the impact of the proposed development, along with the nature of the impact identified. Additionally, this table provides an overview of the residual impact and significance after identified mitigation measures have been included.

Construction Phase

9.7.2 Suitable construction management processes would ensure the potential impact on changes to the natural drainage regime during the construction phase are limited to impacts of negligible magnitude, that would result in **minor adverse (not significant)** effects on flood risk and water quality of the surrounding water bodies.

9.7.3 With suitable pollution prevention measures in place across the Proposed Development, the potential impact magnitude arising from the pollution risk would be considered a negligible impact due to the control of pollution risks, limiting the sources of contamination. The residual effect would therefore be **minor adverse (not significant)**.

9.7.4 With suitable measures in place to address any localised risk on the proposed construction site, the residual impact magnitude will be lowered to a negligible risk, resulting in a **neutral effect (not significant)**.

Operational Phase

9.7.5 The residual effects during operation are largely beneficial, comprising sustainable management of surface water across the Proposed Development, that will result in localised reductions in flood risk, improvements to water quality.

9.7.6 Therefore, these impacts are considered to have a moderate beneficial impact, resulting in a **minor beneficial effect (not significant)**.

9.7.7 The completion of an appropriate on-site foul drainage network coupled with necessary improvements and reinforcement works to the wider foul drainage network and STW would ensure that the residual effect in respect of foul drainage would be considered **neutral (not significant)**. Any improvement works carried out by Thames Water to improve the level of treatment afforded at Swindon STW would seek to reduce this impact further.

9.8 CUMULATIVE IMPACTS

Design, Construction and Operation Phases

9.8.1 The embedded mitigation and the mitigation measures proposed as part of the FRA, the Sustainable Drainage Report and the Wiltshire Surface Water Management Plan provide adequate mitigation of the potential flood and drainage risk posed to the site. Therefore, there are no inherent cumulative impacts that will remain.

- 9.8.2 As a result of the aforementioned mitigation and management measures, the development will not cause any significant adverse environmental impacts to the site, the wider area, and will not increase flood risk outside of the site. The measures suggested aim to provide a betterment to the catchment and will not influence the flood risk to other developments in the area.
- 9.8.3 It is considered that there will be no adverse cumulative impacts associated with any development within the area from a flood risk and drainage perspective. All developments should adhere to the same principles outlined in the NPPF with regard to reducing flood risk and limiting surface water runoff.
- 9.8.4 The only cumulative impacts in terms of flood risk and surface water may be beneficial in terms of further attenuating and restricting surface water runoff into the nearby watercourses, and improvements in water quality from appropriate SuDS design (see **Chapter 11: Cumulative and Synergistic Effects** for further details).

Table 9.9. Assessment Summary and Residual Environmental Effects

Summary description of the identified impact	Sensitivity of Receptor	Impact Magnitude	Significance and Nature of Effect	Additional Mitigation	Residual Impact Magnitude	Residual Significance and Nature of Effect	Confidence Level
Construction							
Increase in runoff rate and volume	Low	Minor	Minor Adverse Indirect – Long-Term – Temporary	Construction Phase Drainage System put in place	Negligible	Neutral	High
Changes to flow regime of smaller watercourses	Low	Negligible	Neutral Direct – Long-Term – Temporary	None	Neutral	Neutral	High
Pollution of local watercourses	Low	Moderate	Minor Adverse Direct – Short-Term – Permanent	Introduction of CEMP Road sweeping	Minor Adverse	Minor Adverse	High
Pollution of Groundwater	Low	Moderate	Minor Adverse Direct – Short-Term – Temporary	Introduction of CEMP Following of EA Policy	Minor Adverse	Minor Adverse	High
Flood Risk to Plant Equipment	Medium	Minor	Minor Adverse Direct – Short-Term – Temporary	Introduction of CEMP	Negligible	Neutral	High
Operation							
Impact on Runoff Quantity	Low	Minor	Minor Beneficial Indirect – Long-Term - Permanent	None	Minor Beneficial	Minor Beneficial	High
Impact on Runoff Quality	Low	Minor	Minor Beneficial Direct – Medium-Term - Permanent	None	Minor Beneficial	Minor Beneficial	High
Flood Risk Impacts	Low	Negligible	Neutral	None	Negligible	Neutral	High
Increase in foul flows to STW	Low	Moderate	Minor Adverse Indirect – Medium-Term – Permanent	Pre-Development Enquiry	Negligible	Neutral	Medium
Increase in Water Demand	Low	Minor	Minor Adverse Indirect – Long-Term – Permanent	Pre-Development Enquiry	Negligible	Neutral	High

Chapter 10: Ecology

Environmental Statement: Volume 1

784-B048803

10.0 ECOLOGY

10.1 INTRODUCTION

- 10.1.1 This Ecology Chapter has been prepared by Ecology by Design to assess the likely significant effects of the proposals on the environment in respect of biodiversity and ecology. It assesses impacts on the Proposed Development site and its biodiversity enhancement area.
- 10.1.2 The scope of the study includes an assessment of:
- The site and its biodiversity enhancement area for assessment of impacts on habitats and protected and priority species;
 - Great crested newts within waterbodies within 250 m of the site; and
 - Designated sites; internationally designated site of nature conservation importance within 7 km, nationally designated sites of nature conservation importance within 5 km and non-statutory sites within 2 km of the site.
- 10.1.3 **Chapter 3: Description of Development** includes a detailed description of the proposals, and site. The site is 7.3 ha in extent, comprising modified grassland, other neutral grassland (with tall ruderal species), bramble scrub, mixed scrub and two hedgerows with trees. The site is bordered by the M4 motorway to the north, and the B4005 borders the southern and southwestern edges of the site.
- 10.1.4 This chapter is supported by the following appendices provided at **Volume 2** to this ES:
- Appendix 10.1: Planning Policy and Legislation;
 - Appendix 10.2: UKHabs Habitat Survey;
 - Appendix 10.3: Survey for Bats;
 - Appendix 10.4: Survey for Great Crested Newts; and
 - Appendix 10.5: Survey for Wintering and Breeding Birds.
- 10.1.5 These reports have been used to define the baseline conditions in relation to ecology in addition to an Arboriculture Report (Patrick Stileman Ltd Arboricultural Consultancy) and Exterior Lighting Survey, Design & Calculation Report (SKR Lighting Design) produced in support of the planning application.

10.2 METHODOLOGY AND SCOPE

Policy Background and Key Legislation

- 10.2.1 There are a number of national, regional and local planning policies and guidance documents that seek to protect nature conservation and ecology and hence are relevant when considering the

effects of the proposals. The residual effects of the Proposed Development, once mitigation and compensation measures have been included, have been considered with reference to these policies and guidance with the objective of determining whether or not the development will result in any significant effects (in planning terms). Consideration has also been given to the legislative requirements that apply to certain sites, species and habitats.

- 10.2.2 The main relevant legislation and national, regional and local planning policies are listed below.
- National Policy Planning Framework (2021 as amended)¹;
 - Wiltshire Core Strategy Development Plan (2015)²;
 - The Natural Environment and Rural Communities (NERC) Act (2006)³;
 - The Conservation of Habitats and Species Regulations (2017, as amended)⁴; and
 - The Wildlife and Countryside Act (1981, as amended)⁵.
- 10.2.3 Local Planning Policy (WBC, 2015) indicates that all development shall ‘ensure no net loss of the local biodiversity resource, and secure the integrity of local ecological networks and provision of ecosystem services’ and Government policy as set out in the NPPF (2021) states that ‘planning policies and decisions should contribute to and enhance the natural and local environment’ by methods including ‘minimising impacts on and providing net gains in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures’ (paragraph 170). Paragraph 174 builds on the broad elements of sustainable development highlighted in paragraph 170 stating that plans should ‘identify and pursue opportunities for securing measurable net gains for biodiversity’.
- 10.2.4 Where relevant, this chapter refers to Habitats and Species of Principal Importance (HPIs and SPIs); these are listed in response to the Natural Environment and Rural Communities (NERC) Act 2006. This list is used to guide decision-makers such as public bodies, including local authorities in implementing their duty to have regard to the conservation of biodiversity, when carrying out their normal functions, including development control and planning.
- 10.2.5 In addition, Government Standing Advice (Gov.uk) provides guidance and information regarding planning and the environment including biodiversity to those involved in decision making on planning and development. Gov.uk advises that planning authorities are required to use Natural England’s standing advice to review applications that may affect protected species and to take the standing advice into account when making this decision. Gov.uk also provides advice on protected species surveys, how they may use the site and mitigation requirements. Standing advice is a material consideration in the determination of the planning application in the same way as any advice received from a statutory consultee.
- 10.2.6 Further details are provided in **Appendix 10.1: Planning Policy and Legislation** of **ES Volume 2**.

¹ MHCLG (2023). National Planning Policy Framework. Ministry of Housing Communities and Local Government.

² Wiltshire Borough Council (2015). Wiltshire Core Strategy Development Plan (Adopted January 2015).

³ Anon (2006). Natural Environment and Rural Communities (NERC) Act 2006. HMSO, London.

⁴ Anon (2017). Conservation of Habitats and Species Regulations 2017. HMSO, London.

⁵ Anon (1983). Wildlife and Countryside Act 1981 (as amended). HMSO, London.

EIA Screening and Scoping Assessment Stage

- 10.2.7 The scope of the surveys and assessments were determined following completion of a desk study and extended habitat survey completed in August 2022. An EIA screening opinion was received (see **Appendix 1.2: Screening Opinion Decision Notice of ES Volume 1**) which indicated that an Ecological Impact Assessment, Biodiversity Impact Assessment and future Landscape and Ecological Management Plan would be required.

Assessment Methodology**Site Surveys**

- 10.2.8 The following surveys and assessments of the site have been undertaken with reference to industry standard guidance⁶:
- Desk study in August 2022 including use of MAGIC and interpreting records within 2km of the site provided by Wiltshire and Swindon Biological Records Centre;
 - UKHabs Habitat survey conducted in August 2022, updated in July 2023⁷;
 - Ground level tree assessment for bats⁸ conducted in August 2022;
 - Habitat Suitability Index⁹ of accessible ponds within 250m of the site;
 - eDNA survey¹⁰ of three ditches and three ponds within 250m of the site;
 - Bat activity surveys (Collins, 2016; walked transects, once per month May and July) and automated detectors once per month June and July); and
 - Biodiversity Impact Assessment¹¹ adopting Defra 4.0 metric.

Assessment Criteria

- 10.2.9 **Chapter 2: EIA Approach and Methodology** identifies the approach to assessment for receptors for the site. In this chapter the term ‘feature’ will be used in place of ‘receptor’ given it is a more ecologically appropriate term.
- 10.2.10 The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this assessment:
- International (European);
 - United Kingdom;
 - National (England);
 - Regional/County (Wiltshire);

- District (Wiltshire Council);
- Local (south-west Swindon and surrounding area);
- Site (the red line boundary for the M4 Junction 16; and
- Negligible (not of ecological importance).

- 10.2.11 Features, including those at the Local and Site levels, are included in the assessment taking into account the CIEEM (2019)¹² guidance with respect to the importance and significance of ecological features. In addition to designated sites, the CIEEM (2019) EclA guidance (Paragraph 4.3 and Box 14) advises that important ecological features can include:

- Habitats and species of principal importance for the conservation of biodiversity listed on Country Biodiversity Lists (Listed under S42 of the Natural Environment and Rural Communities Act 2006);
- UK and Local Biodiversity Action Plan Habitats and Species; and,
- Red Listed, Rare and Legally Protected Species.

- 10.2.12 The CIEEM (2019) guidance (Paragraph 5.25) advises in respect of significance that:

“A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise the project: it can influence whether permission is given or refused and, if given, whether the effect is important enough to warrant conditions, restrictions or further requirements such as monitoring. A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission.”

- 10.2.13 Therefore ecological features, including at the Local and Site Levels, are included in the assessment where their importance fits within that set out in the CIEEM (2019) guidance and their significance is such that their assessment allows the decision maker to be adequately informed of environmental consequences, either positive or negative, of the Proposed Development.

Receptor Sensitivity

- 10.2.14 A first step in ES chapter is determination of which ecological features (habitats, species, ecosystems and their functions/processes), are important. Important features should then be subject to detailed assessment if they are likely to be affected by the Proposed Development. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project effects, such that there is no risk to their viability.
- 10.2.15 The ecological features considered included:

⁶ BSI Standards Limited (2013). BS42020:2013 Biodiversity: Code of practice for planning and development: A guide for Local Planning Authorities. The British Standards Institution. Ltd., London.

⁷ Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020). UK Habitat Classification– Habitat Definitions V1.1. at <http://ukhab.org>.

⁸ Collins, J. (ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edn). The Bat Conservation Trust, London.

⁹ Natural England (2020). GCN Method Statement WML-A14-2 (Version April 2020) the Conservation of Habitats and Species Regulations 2017 (as amended) Method Statement to support application for licence under Regulation 55(2)(e) in respect of great crested newts Triturus cristatus. Natural England, Worcester.

¹⁰ Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, RA., Foster, J., Wilkinson, J., Arnett, A., Williams, P., and Dunn, F. (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

¹¹ Natural England and other parties (2023). Biodiversity Metric 4.0 – Technical Annex 1: Condition Assessment Sheets and Methodology. Natural England Joint Publication JP039. Natural England.

¹² CIEEM (2019). Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. Version 1.1 Updated September 2019. Chartered Institute of Ecology and Environmental Management, Winchester.

- Designated sites (such as SSSI's, SINC's and LNR's);
- Habitats (such as Habitats of Principal Importance in England); and
- Species (such as European Protected Species, Species of Principle Importance in England and species of conservation concern).

10.2.16 Ecological features can be important for a variety of reasons and the rationale used to identify these is explained below. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline.

10.2.17 Professional judgement is required to define the sensitivity of each feature using up to date research and data along with best practice guidelines. Based on this the sensitivity of each feature can be classified as high, medium or low:

- Low sensitivity is assigned to habitats and species known to be comparatively insensitive and resilient to the effects of development;
- Medium sensitivity is assigned to habitats or species known to be moderately sensitive to the effects of development; and
- High sensitivity is assigned to habitats or species known to be very sensitive and susceptible to the effects of development.

Effect Magnitude

10.2.18 For clarity, CIEEM's definition will be used with this ES chapter. Impact: *"Actions resulting in changes to an ecological feature. For example, the construction activities of a development removing a hedgerow."*

10.2.19 According to CIEEM's guidance *"Magnitude refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population."*

10.2.20 Taking into account the CIEEM's guidance, features of less than 'Local' importance are generally considered unlikely to trigger a mitigation or policy response in terms of the ecological assessment. However, where it is helpful to characterise and evaluate features within the site, this assessment also uses the term "site importance". This includes features which are assessed to be of value only in the context of the site. Features of site importance are typically unlikely to require further assessment for the reasons set out above.

Identifying Impacts

10.2.21 The impact assessment process involves:

- Identifying and characterising impacts;
- Incorporating measures to avoid and reduce (mitigate) these impacts;
- Assessing the significance of any residual effects after mitigation;
- Identifying appropriate compensation measures to address significant residual effects; and

- Identifying opportunities for ecological enhancement.

10.2.22 It is only necessary to assess and report significant residual effects (those that remain after mitigation measures have been taken into account). However, it is good practice to make clear both the potential significant effects without mitigation and the residual significant effects following mitigation (CIEEM, 2019). This process of assessment without mitigation helps to identify necessary and relevant mitigation measures that are proportionate to the size, nature and scale of anticipated impacts.

10.2.23 The assessment only needs to describe those characteristics of impacts that are relevant to understanding the ecological effect and determining the significance. It should consider, as appropriate: direct, indirect, secondary and cumulative impacts and whether the impacts and their effects are short, medium, long-term, permanent, temporary, reversible, and/or irreversible. In this chapter, positive effects are referred to as beneficial; negative effects as adverse. The assessment of impacts then takes into account the baseline conditions to describe:

- How the baseline conditions will change as a result of the project and associated activities; and
- Cumulative impacts of the proposal and those arising from other developments.

Effect Significance

10.2.24 For clarity, CIEEM's definition will be used with this ES chapter. Effect: *"Outcome to an ecological feature from an impact. For example, the effects on a dormouse population from loss of a hedgerow."*

10.2.25 CIEEM defines the nature of effects as follows:

- Positive (Beneficial): *"a change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality. This may also include halting or slowing an existing decline in the quality of the environment."*
- Negative (Adverse): *"a change which reduces the quality of the environment e.g. destruction of habitat, removal of foraging habitat, habitat fragmentation, pollution."*

10.2.26 Significant effects are qualified with reference to an appropriate geographic scale, and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

10.2.27 The nature of the identified effects on each assessed feature is characterised. This is considered, along with available research, professional judgement about the sensitivity of the feature affected, and professional judgement about how the impact is likely to affect the site, habitat, or population's structure and continued function. Where it is concluded that an effect would be likely to reduce the importance of an assessed feature, it is described as significant. The degree of significance of the effect takes into account the geographic context of the feature's importance and the degree to which its interest is judged to be affected.

10.2.28 CIEEM defines a significant effect as "An effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'" and that "significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)".

- 10.2.29 A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project: it can influence whether permission is given or refused and, if given, whether the effect is important enough to warrant conditions, restrictions or further requirements such as monitoring. A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects have been lawfully permitted following EIA procedures.
- 10.2.30 For designated sites, the assessment takes into consideration the impact of the Proposed Development on the qualifying factors for the site's designation and the impact on the conservation status of the designated site.
- 10.2.31 In relation to habitats, "conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area" according to CIEEM's guidelines.
- 10.2.32 While in terms of species, under CIEEM's guidelines, "conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area".
- 10.2.33 In this chapter 'Duration' is defined in the context of ecological characteristics, such as species lifecycles. Short-term activities such as disturbance during construction can have impacts in the long-term if for example species reproductive cycles are affected. In this chapter, duration will be described as short, medium or long-term and permanent or temporary. Effects that result from the completion and operational phase of the Proposed Development are classed as 'permanent' or 'long-term' effects. Those resulting from construction and demolition phases and lasting for a set time period are classed as 'temporary' and 'short-term' or 'medium-term'.
- 10.2.34 The effects resulting from the Proposed Development may be direct or indirect, e.g. the loss of a Habitat of Principle Importance or destruction of an active birds' nests are direct effects on ecological features while the installation of lighting may have an indirect effect on light averse species, such as bats, leading to alterations in behaviour. The effect may also be reversible or irreversible.
- 10.2.35 Utilising CIEEM guidance the following criteria for significance has been interpreted and implemented within this chapter. The effects are considered in relation to scale and nature in order to determine significance.

Table 10.1. Criteria for Determining Significance

Criteria	Scale	Nature	Significance
Positive effect on the status of ecological features of interest from international to regional level.	Major	Beneficial	Significant
Positive effect on the status of ecological features of interest from county to borough level.	Moderate		
Positive effect on the status of ecological features of interest at site to local level.	Minor	Beneficial	Not Significant
No noticeable effect on the status of ecological features of interest.	Negligible	N/A	
Negative effect on the status of ecological features of interest at site to local level.	Minor	Adverse	
Negative effect on the status of ecological features of interest at county to borough level.	Moderate	Adverse	Significant
Negative effect on the status of ecological features of interest international to regional level.	Major		

Limitations of the Assessment

- 10.2.36 Although records secured through the desk study and supplied by third parties provide useful background information and contextual information to inform the ecological baseline, they can include individual records supplied by members of the public or be the result of ad hoc surveys. The information can therefore help to inform the likelihood of a particular species being present in the area, but should not be relied upon to definitively or conclusively determine the status (presence or absence) of individual species.
- 10.2.37 The limitations or assumptions for each survey or assessment type are detailed within Technical **Appendices 10.2-10.5**.

10.3 BASELINE ENVIRONMENT

Existing baseline

Designated Sites

- 10.3.1 One nationally designated site is located within 5km of the site and nine locally designated sites occur within 1km of the site. No international designated sites were located within 7km of the site. See Table 10.2 for details of designated sites.

Table 10.2. Records of Statutory and Non-statutory Designated Sites (7km for International, 5km for National Designations and 2km for Local Designations)

Site Name and Designation *	Distance and Direction	Interest
Hagbourne Copse (LWS/ WWTR)	0.16km N	2.08ha; Of interest for small managed broadleaved woodland with abundant bluebell population.
Morningside Farm (LWS)	1.34km SW	25.8ha; Of interest for species rich meadows of neutral grassland running parallel to canal.
Chaddington Lane Verge (PRV)	1.34km SW	1.65ha; Reason for interest not stated.
Lydiard Country Park (LWS)	1.36km N	35.12ha; An area of parkland containing grassland, plantations and semi-natural woodland.
Letterage Copse (LWS)	1.67km NW	1.26ha; Of interest for small ancient semi-natural broadleaved woodland.
Goldborough Farm Meadows (1000852) (SSSI)	2.66km SW	10.26ha; notified for traditionally managed hay meadows, as well as hedgerows, ditches and ponds on site. This site is of botanical and entomological interest.
Wootton Bassett Mud Spring (1006477) (SSSI)	2.74km WSW	0.78ha; notified for lowland bog with vents within a small coppice. This site is of hydrological interest.
Bincknoll Dip Woods (1000824) (SSSI)	2.85km S	5.54ha; notified for rare bryophytes present on the site, as well as the overall woodland habitat.
Rushey Platt Canalside Park (1460495) (LNR)	3.10km ENE	2.17ha; notified for wetland habitats. Water voles noted to be present. This site is of ornithological and botanical interest.
Jubilee Lake (1452118) (LNR)	3.25km WNW	3.95ha; notified for wetland, ancient woodland and grassland habitats. This site is of ornithological interests as it supports a diverse number of bird species.
Restrop Farm and Brockhurst Wood (1000774) (SSSI)	4.12km NW	52.86ha; notified for unimproved hay meadows and permanent pastures, as well as mature hedgerows, scrub and ancient woodland. This site is of ornithological interest.

Clout's Wood (1000841) (SSSI)	4.13km SE	12.62ha; notified for woodland and diversity in floral species. Lies within the North Wessex Downs Area of Outstanding Natural Beauty (AONB). The site is of botanical interest.
Radnor Street Cemetery (1421577) (LNR)	4.14km ENE	4.27ha; notified for semi-natural woodland with some areas managed, and meadows. Bechstein's bat breed on the site. The site is of botanical, and entomological interest.
Quarry Wildlife Garden (1460493) (LNR)	4.55km E	0.57ha; notified for the presence of a pond that supports frogs and dragonflies, and badgers dwelling in the corners of the site as well.

* Where: LNR = Local Nature Reserve; SSSI = Site of Special Scientific Interest; LWS = Local Wildlife Site; WWTR = Wiltshire Wildlife Trust Reserve; and PRV = Protected Road Verge

Habitats

10.3.2 The following habitats were recorded on site. Further details of the habitats, including representative photographs and maps are included within the UKHabs Habitat Report (Technical **Appendix 10.2: UKHabs Habitat Survey**):

- Modified grassland;
- Other neutral grassland;
- Bramble scrub;
- Mixed scrub; and
- Hedgerow with trees.

Modified grassland

10.3.3 Modified grassland dominated by perennial ryegrass (*Lolium perenne*) spans much of the site with occasional cock's-foot (*Dactylis glomerata*), dandelion (*Taraxacum sp.*), broad-leaved dock (*Rumex obtusifolius*) and creeping buttercup (*Ranunculus repens*) within the sward.

10.3.4 Within the biodiversity enhancement area, the grassland was dominated by perennial ryegrass, with Yorkshire fog (*Holcus lanatus*), soft brome (*Bromus hordeaceus*), meadow foxtail (*Alopecurus pratensis*), couch (*Elymus repens*), false oat grass (*Arrhenatherum elatius*), creeping bent (*Agrostis stolonifera*) and Italian ryegrass (*Lolium multiflorum*) present rarely. Herbs were present rarely comprising wood dock (*Rumex sanguineus*) and creeping buttercup (*Ranunculus repens*).

10.3.5 The habitat is of limited intrinsic interest or benefit to fauna owing to its lack of management resulting in poor species and structural diversity. This habitat is considered to be of Negligible value as this habitat is common and widespread within the local context.

Other neutral grassland

10.3.6 Along the northern and western boundaries and southwest corner of the site other neutral grassland is present, with tall herb species present throughout the sward. Species present include false oat

grass (*Arrhenatherum elatius*), tufted hair grass (*Deschampsia caespitosa*), Italian rye grass (*Lolium multiflorum*), creeping thistle (*Cirsium arvense*), vetch (*Vicia sp.*), prickly sow thistle (*Sonchus asper*), bristly ox-tongue (*Helminthotheca echioides*), bittersweet (*Solanum dulcamara*), mugwort (*Artemisia vulgaris*), hogweed (*Heracleum sphondylium*), ragwort (*Jacobaea vulgaris*), spear thistle (*Cirsium vulgare*), wild carrot (*Daucus carota*), colt's-foot (*Tussilago farfara*), field bindweed (*Convolvulus arvensis*) and dove's-foot cranesbill (*Geranium molle*). In damper areas of grassland to the west of the site patches of locally dominant areas of rush (*Juncus sp.*) were present within a narrow drainage ditch.

- 10.3.7 The habitat enhances the wildlife value of the site by providing structural diversity, a nectar resource and shelter for a variety of fauna. They are considered to be of value in the Local context due to the paucity of such features within the highly urbanised local area.

Bramble scrub

- 10.3.8 An area of scrub, dominated by bramble (*Rubus fruticosus agg.*) is present to the north of the site. Other species throughout this scrub include tall herb species as present in the tall ruderal.
- 10.3.9 The habitat is of limited intrinsic interest or benefit to fauna owing to its lack of management resulting in poor species and structural diversity. This habitat is of negligible value. This is considered to be of Negligible value as this habitat is common and widespread within the local context.

Mixed scrub

- 10.3.10 Areas of mixed scrub on site were dominated by blackthorn, with other species present including bramble, mugwort and creeping thistle.
- 10.3.11 The habitat enhances the wildlife value of the site by providing structural diversity and shelter for a variety of fauna. They are considered to be of value in the Local context due to the paucity of such features within the highly urbanised local area.

Hedgerow with Trees

- 10.3.12 H1- Hedge 1 (the central hedge) is 0.234 km length and comprised of blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), apple (*Malus sp.*), elder (*Sambucus nigra*) and bramble (*Rubus fruticosus sp.*) Tree species present were dominated by elm (*Ulmus sp.*). The hedgerow is in moderate condition.
- 10.3.13 H2- Hedge 2 (the western hedge) is 0.099 km length and comprised of blackthorn, hawthorn, field maple (*Acer campestre*), bramble and Rosa sp.. Tree species present include oak (*Quercus sp.*), crack willow (*Salix x fragilis*), and elm. The hedgerow is in moderate condition.
- 10.3.14 H3- Hedge 3 (the off-site eastern hedge) is 0.059 km length and comprised of predominantly of blackthorn with cherry plum (*Prunus cerasifera*), hawthorn, bramble, and elm present. Ground floral species comprise false oat grass, nettle, creeping thistle, docks (*Rumex sp.*) and cow parsley (*Anthriscus sylvestris*). The hedgerow is in moderate condition.

- 10.3.15 H4- Hedge 4 (the south-eastern hedge) is 0.065 km length and is of similar composition to H3 with mature oak (*Quercus sp.*) trees also present. The hedgerow is in good condition.

- 10.3.16 The hedgerow habitat enhances the wildlife value of the site by providing structural diversity and shelter for a variety of fauna. They are considered to be of value in the Local context due to the paucity of such features within the highly urbanised local area.

Habitat Evaluation

- 10.3.17 Several of the habitats on site are of relative elevated ecological importance in the context of the site including other neutral grassland, hedgerows (with trees) and scrub. The hedgerows are priority habitats in accordance with Maddock (2011)¹³. The hedgerows within the site are part of an important scattered tree network, forming an ecological feature in the local landscape offering 'stepping stone' habitat connectivity for various species including birds and bats. The hedgerows with trees are considered to be of Local value with the majority being retained under the proposed plans, with a small section of H1 to be removed to accommodate access.
- 10.3.18 All other habitats (particularly the modified grassland) within the site itself comprise a limited assemblage of species which are common within both a local and national context and do not display a particularly high species richness or structural diversity. They are therefore considered to be of negligible ecological importance but contribute to the baseline biodiversity value of the site. Given this assessment, detailed consideration of impacts upon these habitats is not considered necessary and therefore these habitats are not considered further in this assessment.

Species

Plants

- 10.3.19 No protected or priority plant species were recorded within the site and the habitats are considered unlikely to support species of interest due to their age, condition and structure.
- 10.3.20 62 records of 26 flowering plant species were returned by the desk study within 2km of the site. The closest of these records was recorded on site, however the resolution of this record is low, and the description marks the record as being outside of the site boundary to the west.
- 10.3.21 Protected plant species are therefore scoped out from further assessment.

Invertebrates

- 10.3.22 It is considered unlikely that the site will support an important assemblage of terrestrial invertebrates due to the limited habitat types, limited botanical species diversity, and lack of structural diversity recorded. Invertebrates are therefore scoped out from further assessment.
- 10.3.23 No records of white-clawed crayfish (*Austropotamobius pallipes*) were returned within 2km of the site boundary. The site does not provide suitable habitat for this species and the site adjacent ditches are unsuitable for the species due to the flow and substrate.

¹³ Maddock, A. (ed) (2011). UK Biodiversity Action Plan Priority Habitat Descriptions (updated Dec. 2011). Joint Nature Conservation Committee, Peterborough.

Amphibians

- 10.3.24 There were 72 records of great crested newts (GCN) (*Triturus cristatus*) within 2km of the site boundary. Notably, 52 of these records were north of the M4; it would be extremely unlikely for GCN to commute across this road and colonise the site boundary.
- 10.3.25 There is potential for this species to breed within the ponds in the vicinity of the site, and to forage and hibernate within the site and adjacent areas. Whilst seven ponds were present within 500m of the site boundary, only three ponds are present both within 250m of the site boundary and south of the M4.
- 10.3.26 An eDNA survey was completed which confirmed the presence of GCN within a pond ~220 m from the site boundary (pond 2).
- 10.3.27 Any population of an EPSM species is considered to be of County importance.

Reptiles

- 10.3.28 14 records of reptiles were returned within 2km of the site. Suitable habitat and opportunities for reptiles within the site are present within the grassland, treeline and hedgerow edges, and bramble and mixed scrub on site. The presence of damp grassland and nearby ponds/water bodies further increase the suitability of the site for grass snake. However, much of the site comprises predominantly short sward modified grassland which is of poor foraging and refuge opportunities for reptiles. The habitat may be of value to a very small population of reptiles at the site level.

Birds

- 10.3.29 624 records of 42 bird species were recorded within 2km of the site. Records of Schedule 1 red kite (*Milvus milvus*) were returned within the site boundary (most recently in 2017), as well as a record of schedule 1 barn owl (*Tyto alba*) bordering the southeast of the site (dates 2015). Importantly, in 2006, lapwing (*Vanellus vanellus*) were noted on site; 98 individuals were recorded in December of that year. In January 2007, 100+ individuals of the species were noted at the site, including a ‘dozen’ pairs.
- 10.3.30 There are opportunities for wintering, foraging and nesting birds within the site. Nesting opportunities included trees, hedgerows, bramble and mixed scrub and rough grassland habitat. The short grassland provides suitable nesting habitat for ground nesting bird such as lapwing. Areas of damp grassland further improves the site’s suitability for the species. The site also provides opportunities for wintering birds, including lapwing; the above records were noted during the winter months.
- 10.3.31 23 species were recorded during wintering bird surveys, 11 of which are notable:
- Fieldfare (*Turdus pilaris*), redwing (*Turdus iliacus*) and red kite (*Milvus milvus*) are Schedule 1 species recorded within the site.
 - Dunnock (*Prunella modularis*), reed bunting (*Emberiza schoeniclus*) and song thrush (*Turdus philomelos*) are Section 41 species recorded within the site.
 - Meadow pipit (*Anthus pratensis*), common snipe (*Gallinago gallinago*), sparrowhawk (*Accipiter nisus*), woodpigeon (*Columba palumbus*) and wren (*Troglodytes troglodytes*) are amber listed species recorded within the site.

- 10.3.32 27 bird species were recorded during breeding bird surveys. Of these, none were confirmed breeding, 17 were probable breeders, six possible breeders and five were non-breeding species.

- None of the species recorded are Schedule 1 species. Six species are listed on Section 41 of the NERC Act (2006), three are on the Birds of Conservation Concern (BOCC) red list and 11 are on the BOCC amber list.
- Of these, bullfinch (*Pyrrhula pyrrhula*), common whitethroat (*Sylvia communis*), dunnock, reed bunting, skylark (*Alauda arvensis*), song thrush (*Turdus philomelos*), woodpigeon and wren were considered ‘probable breeders’ due to observed behaviours including pairs, territorial behaviour, and males observed singing in the same location on more than one survey.
- Notable ‘possible breeders’ included meadow pipit, mistle thrush and willow warbler.

- 10.3.33 The breeding bird surveys have confirmed presence of a typical assemblage of farmland bird species, with some wetland species of interest associated with the off-site pond in the west. Two territories of skylark will be lost as a result of the proposals, however, this is not considered to be of significance as they are a widespread species within Wiltshire (being present in 809 of 915 tetrads and breeding in 602). The assemblage of bird species within the site is considered to be of Local importance.

Bats

- 10.3.34 Individuals are likely to forage over the site and to commute along hedgerows and treelines. There is a network of loosely connected hedgerows and treelines surrounding the site that could provide connective habitat. The woodland stands to the south of the B4005 is likely to provide valuable foraging and/or roosting habitat for bats.
- 10.3.35 Bats may also roost within onsite trees, two trees within H1 were noted as having suitability to support roosting bats, comprising an oak tree with low potential to support the species and an elm tree with high suitability to support the species. Both of these trees are to be retained within the proposals.
- 10.3.36 Low level bat activity was noted during both transects completed during late May and early July. During the May transect no passes within the central portion of either the central field or the eastern field. Common species were noted largely passing along H2 and H4. During the July transect activity was noted within the eastern field (particularly comprising noctule (*Nyctalus noctula*)), and along the southern boundary of the site as well as around the balancing pond. Bats also were noted foraging around the streetlights in the vicinity of the balancing pond.
- 10.3.37 The static detectors were deployed in early June and early July along H2 and H3. Species recorded comprised largely common and widespread species consisting of predominantly common and soprano pipistrelle (*Pipistrellus pipistrellus* and *P. pygmaeus*) with some activity recorded of *Myotis* sp., and noctule, serotine (*Eptesicus serotinus*) or Leisler’s bat (*Nyctalus leisleri*) species; activity level were considered to be of low-moderate level. Two lesser horseshoe (*Rhinolophus hipposideros*) commuting passes were noted along H3 in June only, with no registrations of the species at either hedgerow in July. Notably, H3 is to be retained in its entirety under the proposals with improved foraging habitat for bats adjacent to the hedgerow.

- 10.3.38 127 records of nine bat species have been recorded within 2km of the site including common pipistrelle, soprano pipistrelle, brown long-eared (*Plecotus auratus*), lesser horseshoe, noctule, Natterer’s (*Myotis nattereri*), Daubenton’s (*Myotis daubentonii*) and serotine bats.
- 10.3.39 The site is within the core sustenance zones, zones where bats are likely to forage from a known roost, of all bats recorded¹⁴. The habitat is considered to be of significance to bats at the Site level.
- Other Mammals
- 10.3.40 Hedgerows and treelines within and adjacent to the site, while ostensibly suitable for dormouse (*Muscardinus avellanarius*), are considered to have limited potential to sustain a dormouse population due the isolation of the site providing limited opportunity for colonisation. Although the plans are in the early stages, it is understood that hedgerows are to be retained under the proposals. Furthermore, it is it understood suitable dormouse habitat will be provided in the form of tree planting and that the proposals would not introduce predators such as cats to the local landscape. Two records of the species were returned within 2km of the site, both from 2013. The closest of these records was recorded 0.39km E of the site boundary, where one individual was noted in a nest tube.
- 10.3.41 There was no evidence of badgers (*Meles meles*) using the site such as setts or latrines. 30 records of badger were returned by the desk study within 2km of the site boundary. The closest of these records were recorded within the site boundary, to the northwest, between 1995 and 2020. It is likely that badgers commute and foraging throughout the site, and it is possible that badgers may utilise the site for sett building. The habitat may be of value to badgers at the Site level.
- 10.3.42 14 records of water vole (*Arvicola amphibius*) were returned by the desk study. The closest of these records was recorded 0.62km south of the site in 2010. The site is not suitable for water vole as there are no bodies of water or suitable habitats within the site boundaries. Other areas around the site may be suitable, such as the ditches adjacent on the northern and southeast boundaries, however it is unlikely that the water vole would commute through the site. Five records of otter were returned by the desk study. The site is not suitable for otters as there are no bodies of water or suitable habitats within the site boundaries. As above, the site-adjacent ditches may be suitable, however it is unlikely that the otters would commute through the site.
- Species Evaluation
- 10.3.43 Due to their likely absence from the site the following species have been ‘scoped out’ of the assessment and are not considered further as part of the assessment: white-clawed crayfish, otter, water vole, dormouse, and invertebrates. Measures for nesting birds, badger and reptiles are discussed further in relation to legal compliance; however, these species are not significant in ecological impact assessment terms.
- Summary of Ecological Features
- 10.3.44 Taking into account the mitigation integrated within the design scheme as set out in Section 10.4, Table 10.3 presents a summary of ecological features which need to be further assessed and those for which adverse impact can be excluded from further assessment.

Table 10.3. Summary of Ecological Features to be Assessed or for which Adverse Impact can be Excluded from Further Assessment

Feature	Evaluation	Assess	Scope out	Rationale
Sites of Special Scientific Interest	National		✓	All designated sites within the search area are not considered likely to be impacted by the Development during construction or operation due to geographical distance and/or the nature of the qualifying habitat.
Local Nature Reserves	Regional		✓	
Local Wildlife Sites	Local		✓	
Wiltshire Wildlife Trust Reserves	Regional		✓	
Protected Road Verges	Local		✓	
Habitat loss / Biodiversity net gain	Local	✓		Delivering biodiversity net gain will be achieved by creating and managing habitats of increased value for biodiversity within the site and biodiversity enhancement area for 30 years under a Landscape and Ecology Management and Monitoring Plan.
Modified grassland	Negligible		✓	Habitat does not conform to any HPI description and is not a local priority habitat. The habitat is common and widespread in the surrounding area and is therefore excluded from further assessment. Habitat loss will be accounted for by the biodiversity net gain element above.
Other neutral grassland	Local		✓	
Bramble scrub	Negligible		✓	
Mixed scrub	Local		✓	
Hedgerow with trees	Local		✓	Whilst a HPI, the habitat is common and widespread in the surrounding area and is therefore excluded from further assessment. Habitat loss will be accounted for by the biodiversity net gain element above.
Plants	Negligible		✓	No protected or priority plant species were recorded within the site and the habitats are considered unlikely to support species of interest due to their age, condition and structure.

¹⁴ Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

Great crested newt	County		✓	The avoidance, mitigation and good practice measures to be adopted alongside the District Licence will be sufficient to give confidence that a significant adverse impact will not arise. Species excluded from further assessment.
Reptiles	Site		✓	The majority of the site is of negligible suitability for reptiles with small areas of suitable habitat, primarily on the boundaries which will be retained and enhanced, protecting individuals during construction and operation.
Birds	Local	✓		Measures will need to be adopted during construction to protect nesting birds. Two territories of skylark will be lost and compensation will be required to ensure the proposals deliver a net gain for priority bird species during operation.
Bats (foraging and commuting)	Site	✓		A sensitive lighting scheme will be developed to avoid the short-term degradation of foraging and commuting bat habitat. The biodiversity enhancement area will maintain and increase opportunities for foraging bats during operation.
Dormouse	N/A		✓	No impact is predicted as the species is likely absent from the site. Species excluded from further assessment.
Invertebrates	Negligible		✓	Due to the limited habitat types, limited botanical species diversity and lack of structural diversity within the site an invertebrate assemblage of value is considered unlikely to be present.
Badger	Site		✓	No evidence that this species is present. Given the highly mobile nature of this species, best working practices will be employed during construction and operation. Species excluded from further assessment.

Receptors and Receptor Sensitivity

10.3.45 The existing receptors/features on site which are being scoped in and their sensitivity are detailed in Table 10.4.

Table 10.4. Existing Feature Sensitivity

Existing Features	Sensitivity		
	High	Medium	Low
Habitats (accumulated)		X	
Breeding birds		X	
Bats	X		

Future baseline

10.3.46 No change to the management of habitats within the site is anticipated, therefore in the absence of development within the site, it is considered that the biodiversity value of the site will be unchanged.

10.4 MITIGATION WITHIN THE SUBMITTED DESIGN

Design

- 10.4.1 To ensure compliance with local and government policy to achieve a net gain, a biodiversity offsetting calculator has been used as a tool to determine whether the proposals as a whole are likely to be compliant with government policy.
- 10.4.2 Key to this has been the incorporation of a biodiversity enhancement area in the eastern part of the site to compensate for any loss of biodiversity and deliver biodiversity enhancements. Habitats to be created within the biodiversity enhancement area include other neutral grassland (good condition) and a species-rich hedgerow with trees on the northern boundary.
- 10.4.3 In addition, the landscaping scheme has been designed to (i) ensure connectivity for wildlife around the perimeter of the site, (ii) maintain a dark corridor for wildlife in the east, and (iii) incorporate bat and bird boxes in the biodiversity enhancement area.
- 10.4.4 The landscape proposals include the creation of mixed native scrub along the northern and southern boundaries of the site, creation of SuDS ponds and ditches, additional hedgerows, and enhancement of the east field to other neutral grassland.
- 10.4.5 The mixed native scrub will provide additional nesting opportunities for dunnock, whitethroat and wren, and will provide a level of acoustic attenuation which may result in greater numbers of nesting territories throughout the site.
- 10.4.6 The creation of SuDS ponds and ditches throughout the should be managed in a similar manner to the attenuation basin to the west of the site, with vegetation left long overwinter to provide a

foraging resource for reed bunting. With scrub and SuDS along the south boundary, there is increased likelihood of successful nesting by reed bunting.

- 10.4.7 The new hedgerows and scrub will be planted with a mix of berry-bearing species including hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*) and rowan (*Sorbus aucuparia*), which will provide wintering foraging habitat for redwing.
- 10.4.8 The other neutral grassland will provide foraging habitat for wintering meadow pipit and a greater diversity of plants and invertebrates will benefit the wider bird assemblage. Due to the smaller field size, this is not suitable for nesting skylark, which requires open space.
- 10.4.9 The development of the site is likely to attract other notable bird species to the site including house sparrow (*Passer domesticus*), starling (*Sturnus vulgaris*) and swift (*Apus apus*), which were not recorded during the surveys. Therefore, nesting opportunities will be provided for these species.
- 10.4.10 Consultation with SKR Lighting Design has resulted in the production of a sensitive **Exterior Lighting Survey, Design & Calculation Report** which:
- Considers the woodlands to the south and the hedgerows to the east, following ILP criteria¹⁵ guidance for bats and wildlife ensuring dark corridors are being maintained;
 - Only adopts LED light sources with zero up-light; and
 - Is controllable with dusk to dawn switching.

Construction

- 10.4.11 Prior to construction commencing a District License for great crested newts will be secured for the site to ensure the proposals will ensure the favorable conservation status of the species is maintained.

10.5 LIKELY SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE SCHEME

Construction Phase

Habitats

- 10.5.1 Potential impacts during the construction phase include:
- Habitat loss resulting in loss of biodiversity.
- 10.5.2 The accumulation of the habitat features is of medium sensitivity and loss of habitats would be of moderate magnitude resulting in an effect of intermediate significance. Habitat enhancement will be conducted alongside site clearance to ensure that there is a limited lag between habitat loss and higher quality habitat creation. This will ensure there is negligible residual impact during construction resulting in a neutral effect.

Species

- 10.5.3 Potential impacts during the construction phase include:

- Potential destruction of active birds' nests during site clearance; and
- Potential disturbance of bats and birds using the eastern section of the site through light pollution.

- 10.5.4 All breeding birds are protected making it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. There is potential to disturb breeding birds or damage active nests during site clearance. Birds are of medium sensitivity and destruction of active bird nests would be of slight magnitude resulting in an effect of minor significance. Site clearance will be timed to avoid impacts on nesting birds or preceded by checks to ensure active nests are protected until they are no longer active. These measures will be detailed within a Construction and Environment Management Plan (CEMP) and will ensure there is negligible residual impact during construction resulting in a neutral effect.
- 10.5.5 All species of bat are protected in England making it illegal to injure or kill a bat, to disturb, damage, destroy or obstruct a bat roost. During the surveys low levels of bat activity were recorded. Activity was dominated by common and widespread species consisting of predominantly common pipistrelle (76.8% of passes) with low levels of soprano pipistrelle (6.3%), *Myotis* sp. (10%) and noctule / serotine / Leisler's bat species (6.6%). Two lesser horseshoe passes were recorded at H3 (the eastern boundary of the biodiversity enhancement area) in June, with no registrations of the species within the site in May or July.
- 10.5.6 Potential for impacts to foraging and commuting bats due to temporary lighting. The feature is of high sensitivity to lighting and impacts to foraging and commuting bats would be of moderate magnitude resulting in an effect of intermediate significance. Habitat enhancement will be conducted alongside site clearance to ensure that there is a limited lag between habitat loss and higher quality habitat creation. In addition, a sensitive lighting scheme will be adopted during construction to ensure key flight lines are protected and the biodiversity enhancement area remains unlit. These measures will be detailed within the CEMP and will ensure there is negligible residual impact during construction resulting in a neutral effect.

Operational Phase

Habitats

- 10.5.7 Potential impacts during the operational phase include:
- An increase in the availability and quality of habitats on site.
- 10.5.8 The creation of habitat on site including green roofs, planting of trees, scrub and areas of species rich grassland will lead to a net gain in biodiversity on site providing opportunities for local wildlife. Monitoring will be required to ensure habitats achieve the stated conditions and that management optimises benefits for biodiversity. In the event the biodiversity enhancement area becomes impacted by recreational pressure, measures will be adopted to prevent trespassing. The impact is long-term, moderate magnitude ensuring there is negligible residual impact during Operation resulting in a minor positive long-term residual effect.

¹⁵ BCT & ILP (2023). Guidance Note GN08/23 Bats and artificial lighting at night. Bats and the Built Environment series.

Species

- 10.5.9 Potential impacts during the operational phase include:
- Reduction in foraging or nesting habitat for birds; and
 - Increased light pollution due to poor lighting design.
- 10.5.10 Habitat creation within the site will provide increased opportunities for foraging birds.
- 10.5.11 Nesting opportunities for birds will be included within the proposals for house sparrow, starling and swift. Four sparrow terraces and four starling boxes will be incorporated into the building, which will be placed on the northern and/or eastern aspects at a minimum height of 2m, in an area with a clear flight path but close to vegetation. A swift tower will be placed in the field to the east. This should be a minimum of 7m high, at least 15m from any vegetation, in an area of shade where possible. The entrance holes must be 30mm high x 65mm wide to avoid use by starlings. At least 12 nest chambers should be present with internal dimensions of 18cm high x 42cm wide x 16cm deep. An acoustic lure playing swift calls will be required between the beginning of May and the end of July, playing from dawn to 9am, and 4pm to dusk. This may be needed for multiple years before swifts take up residence, at which point the lure can be removed.
- 10.5.12 The installation of lighting with the Proposed Development could disturb bats on or directly adjacent to the site, particularly with regard to bats foraging and commuting along the central hedgerow. This is moderate magnitude impact of intermediate significance. A sensitive lighting scheme has been designed in consultation with SKR Lighting Design taking into account industry standard guidance¹⁶ to ensure key flight lines are protected and the biodiversity enhancement area remains unlit. Enhancement of habitats in the east of the site for foraging bats and incorporation of opportunities for roosting bats (five woodcrete /woodstone pole-mounted bat boxes) will ensure a neutral effect is achieved.
- Biodiversity Impact Metric**
- 10.5.13 The 7.3 ha site has a baseline biodiversity value of 17.36 habitat units, 5.89 hedgerow units and no river units.
- 10.5.14 The Biodiversity Metric Calculator identifies a net gain of +2.47 habitat units, equivalent to a change of 14.21% will be achieved, alongside a net gain of +0.61 hedgerow units, equivalent to 13.29% change.
- 10.5.15 Condition assessments were made on a precautionary basis for robustness. The actual biodiversity net gain potentially achievable at the site may exceed the values above. Assumptions on composition and condition of proposed habitats are explained; broad creation/management specifications, timeframes and monitoring requirements are provided by this report that would be required to meet these assumptions.
- 10.5.16 The metric also indicates that rules relating to ‘trading down’ have been satisfied.

- 10.5.17 Features such as bird boxes and bat boxes are not considered within the biodiversity metric calculation but will be incorporated within the site which will further enhance the site for wildlife.
- 10.5.18 This assessment has robustly demonstrated that the proposals will result in a biodiversity net gain, satisfying Core Policy 50 of Wiltshire Core Strategy Development Plan, ensuring a biodiversity gain will be achieved as part of the proposals. No guidance for a specific percentage gain is specified, however, a net gain in excess of 10% biodiversity gain will be achieved as part of the proposals. Post-consent, this report should be used to inform a detailed Biodiversity Net Gain Management and Monitoring Plan (BMMP). A BMMP will be required to ensure the long-term delivery of the habitats contributing to the quantitative net gain calculated by this report.

10.6 ADDITIONAL MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES

- 10.6.1 No further mitigation, compensation or enhancement measures are required during the construction or operation phases.

10.7 ASSESSMENT SUMMARY AND LIKELY SIGNIFICANT RESIDUAL ENVIRONMENTAL EFFECTS

- 10.7.1 The incorporated mitigation, compensation and enhancement measures during Construction and Operation will ensure all residual effects are neutral and/or minor positive, as detailed within Table 10.5.

10.8 CUMULATIVE IMPACTS

- 10.8.1 The potential for cumulative effects has been considered in relation to 4 planning applications which have been identified within approximately 3km of the centre of the site. Details of which are provided in **Chapter 11: Cumulative and Synergistic Effects**.
- 10.8.2 The Proposed Development will achieve neutral to minor positive effects, as will other developments being brought forward due to the requirement for Biodiversity Net Gain, therefore the cumulative impacts on designated sites and habitats is considered to be neutral to minor positive. The impacts on species is considered to be neutral.

¹⁶ BCT & ILP (2023). Guidance Note GN08/23 Bats and artificial lighting at night. Bats and the Built Environment series.

Table 10.5. Assessment Summary and Residual Environmental Effects

Summary description of the identified impact	Sensitivity of Feature	Impact Magnitude	Significance and Nature of Effect	Additional Mitigation	Residual Impact Magnitude	Residual Significance and Nature of Effect	Confidence Level
Construction							
Habitat loss / Biodiversity net gain	Medium	Moderate magnitude	Intermediate	Habitat enhancement within biodiversity enhancement area alongside site clearance	Negligible	Neutral	High
Birds	Medium	Slight magnitude	Minor	Protecting nesting birds during site clearance	Negligible	Neutral	High
Bats	High	Moderate magnitude	Intermediate	Sensitive lighting scheme during construction to avoid illuminating sensitive features	Negligible	Neutral	High
Operation							
Biodiversity net gain	Medium	Moderate magnitude	Intermediate	Managing habitats for 30 years in accordance with the Landscape and Ecology Management and Monitoring Plan to achieve the target conditions proposed within the BIA Report	Negligible	Minor positive	High
Birds	Medium	Slight magnitude	Minor	Incorporating high value features for foraging and nesting priority bird species	Negligible	Minor positive	High
Bats	High	Moderate magnitude	Intermediate	Enhancement of habitats in the east of the site for foraging bats and sensitive lighting to maintain dark habitats	Negligible	Neutral	High

Chapter 11: Cumulative and Synergistic Effects

Environmental Statement: Volume 1

784-B048803

11.0 CUMULATIVE AND SYNERGISTIC EFFECTS

11.1 INTRODUCTION

- 11.1.1 This chapter of the ES considers the findings from the individual assessments within the Environmental Statement and provides an assessment of the cumulative and synergistic effects of the Proposed Development both in combination with other developments and from within the development itself.
- 11.1.2 This chapter has been produced in accordance with the EIA Regulations¹ which require that:
‘The EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the Proposed Development on the following factors –
(a) *Population and human health;*
(b) *Biodiversity....;*
(c) *Land, soil, water, air and climate;*
(d) *Material assets, cultural heritage and the landscape;*
(e) *The interaction between the factors referred to in sub-paragraphs (a) to (d).’ [Regulation 4(2)]*
And
‘A description of the likely significant effects of the development on the environment resulting from, inter alia:
.....
(f) *the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.’ [Schedule 4(5)]*
- 11.1.3 Cumulative effects within EIA are considered to be:
- Effects caused by the actions of different projects together with the project being assessed. These impacts can either contribute to an existing impact or combine to produce an additional impact; and,
 - Impacts between different environmental aspects of a single project which in-combination, incrementally have greater effect on particular receptors.
- 11.1.4 Accordingly, this chapter considers two types of cumulative environmental effects in association with the Proposed Development:
- Synergistic – the combined effect of different types of impacts attributable to the Proposed Development; and,

- Cumulative – effects which arise from the combined effect of the Proposed Development with other committed developments.

11.2 METHODOLOGY AND SCOPE

Policy Background

National Planning Policy Framework

- 11.2.1 The National Planning Policy Framework (NPPF)² places an emphasis on viability and deliverability of plans, ensuring that sites and scales of development should not be subject to such a scale of obligations and policy burdens that their ability to be developed viably is threatened. The NPPF emphasises that cumulative impacts should be considered for a number of topics such as:

Planning and flood risk:

- 11.2.2 Paragraph 160 states:

‘Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.’

Ground Conditions and pollution

- 11.2.3 Paragraph 185 states:

‘Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.’

- 11.2.4 Paragraph 186 states:

‘Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas.’

Key Legislation

EC Environmental Impact Assessment (EIA) Directive (2014/52/EU)³

- 11.2.5 The EC Environmental Impact Assessment (EIA) Directive (85/337/EEC, as amended by the Directives 97/11/EC, 2003/35/EC, 2009/31/EC, 2011/92/EU and replaced by 2014/52/EU) requires ‘the likely significant effects of projects on the environment must be considered in relation to...the cumulation of the impact with the impact of other existing and/or approved projects.

¹Her Majesty’s Stationery Office (HMSO). (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations 2017

² MHCLG (2023). National Planning Policy Framework. Ministry of Housing Communities and Local Government.

³ European Commission. (2014). EC Environmental Impact Assessment Directive

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017/571)⁴

- 11.2.6 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (herein EIA Regulations) outlines ‘the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources’ to be included within ES’.
- 11.2.7 As required by Schedule 4, Paragraph 5e) of the EIA Regulations, the assessment will take into consideration other existing and /or approved projects.

Assessment Methodology

- 11.2.8 A range of public sector and industry-led guidance is available on Cumulative Effects Assessment (CEA) and Synergistic or In-combination effects, but at present there is no single, agreed industry standard method. Consequently, the approach to CEA varies between applications. The approach to this assessment is based on previous experience and professional judgement, the types of receptors being assessed, the nature of the scheme and the environmental information available to inform the assessment.

Cumulative

- 11.2.9 Cumulative effects occur as a result of the interaction of the construction and operation of the Proposed Development with ‘other’ projects and plans.
- 11.2.10 A Zone of Influence (ZOI) was established, in terms of the distance from which impacts would mostly be experienced and a list of ‘other developments’ was identified within that distance. For the purposes of this assessment, committed development is defined as those developments meeting one or more of the following criteria:
- It is subject to a planning application, has been, or is currently being consulted upon; has been identified as a local plan commitment or has planning permission;
 - It comprises more than 10,000 sqm of development and/or 100 or more residential units;
 - It is expected to be built-out at a similar time as the proposal;
 - It is considered likely to result in significant environmental effects of some nature, often signified by being subject to EIA; and,
 - It is within a relevant geographical boundary or zone of influence.
- 11.2.11 The list obtained at these stages is then assessed cumulatively with the Proposed Development and a clear justification for scoping out sites that are likely to represent no significant effects for a specific topic (s) is provided. This staged process was undertaken within Table 11.1 which lists schemes proposed to be assessed as part of the EIA assessments. The list of cumulative sites to be considered were agreed within the specialists within the scoping exercise undertaken July 2023.

Synergistic

- 11.2.12 Synergistic effects are the effects which in isolation may only represent a slight effect upon a receptor, but in conjunction with the other effects arising from the topic assessments, may represent a greater effect and need to be given further consideration. For example, a local resident might be affected by the noise from the construction phase but might also be affected by dust and increased traffic. Individually, these might not be assessed as being significant, but in combination they might become significant.
- 11.2.13 As there is no established EIA methodology for assessing and quantifying the combined effects of individual effects on sensitive receptors, Tetra Tech has developed an approach which uses the residual effects of the Proposed Development to determine the potential for impact interactions and the consequent potential for combined effect of individual receptors. This form of cumulative assessment is based upon the residual effects as it has been assumed that the additional mitigation detailed within individual topic chapters will be implemented, as it can be readily secured through the planning system.
- 11.2.14 For some environmental or social topics, no interactions with other aspects can occur and so no combined effects on individual receptors could arise. Where this is the case, the combined effect is not included in the assessment. On this basis, only those effects which have been determined to be minor/slight or above have been considered to represent an effect on identified receptors and are therefore represented in the in-combination effects table.
- 11.2.15 The assessment of effect interactions has been undertaken in following steps:
- Step A: Identification of receptors or resources considered in more than one technical chapter, and therefore having the potential to be affected by more than one environmental factor. It is during this step that exclusions were identified to avoid overlap with information reported in technical chapters; and,
 - Step B: For receptors or resources identified in Step A, the significance of the residual effect from each relevant technical chapter were identified. Consideration was then given to whether there would be a cumulative effect between each individual effect and if so whether the cumulative effect would be of the same or greater significance of the component effects.

Scoping Assessment Stage

- 11.2.16 A scoping assessment stage was not undertaken for the ES. For this reason, the sites considered and, where necessary, assessed in this chapter include those which have been agreed within the specialists as part of a scoping exercise undertaken through a desktop review and professional judgement.

Limitations of the Assessment

- 11.2.17 There is no established methodology or guidance for assessing and quantifying cumulative or in-combination effects, and therefore the assessment below is qualitative and is based on expert judgement in line with industry best practice.

⁴ The Town and Country Planning (Environmental Impact Assessment) Regulations 2017

- 11.2.18 The developments assessed within this chapter have been identified by Tetra Tech and Smith Jenkins (the Planning Consultant) through an informal review of the planning domain. No formal opinion was sought from Wiltshire Council. Also, it is possible that other planning applications are made during the determination of this planning application which are therefore not included in this assessment.
- 11.2.19 The cumulative assessment is quantitative where practical and utilises relevant data from the corresponding planning applications where this exists in the public domain. Where information does not exist, reasonable assumptions have been made based on the information that is available or an assumption that other schemes will comply with the general national and local policy requirements.

Table 11.2. Cumulative Schemes Assessed

ID	Development Name	Application Reference	Application for 'other development' and brief description	Status	Distance from the Proposed Development?	Progress to ES Assessment?
1	Studley Grange Garden and Leisure Park	19/02146/FUL	Demolition of 328m canopy, infill extensions of a) 39m and b) 553m, erection of building for relocated indoor play centre 598m, siting of Portakabin sales office (35m), change of use of open sales area to outdoor play area, change of use of car park to ancillary landscape materials yard, change of use of retail area to car park and formation of coach parking area, all for use as garden centre, craft centre and family leisure attraction.	Partially developed	580 m to the south	Yes
2	Wichelstowe Development	S/13/1524	Southern Town Expansion including up to 4,500 dwellings, employment, commercial, shopping, schools, open space, park and ride, roads, sewers and associated works (Variation of extent of infrastructure, phasing and affordable housing, upon S/TIME/13/1521 by the Local Planning Authority, conditions 1, 62, 66 & 67, 73, 76 - 79, 82, 85, 88 - 90, 93 and 95 - 97).	Decision: Granted Permission Fri 28 Feb 2014	1.4 km to the northeast	Yes
3	Royal Wootton Bassett	PL/2023/02129	Outline planning application with all matters reserved except access for up to 410 dwellings, land for a primary school and pitches, public open space, landscaping and associated infrastructure.	Awaiting decision	1.9 km to the southwest	Yes
4	Land To The Rear Of Woodland View	S/OUT/20/0556	Erection of 104no. dwellings, traffic roundabout, roads and associated works - Means of Access, Layout and Scale not reserved - (without compliance with condition 29 of permission S/15/1750 regarding substitute drawings).	Decision: Granted Permission Wed 10 Feb 2021	4.3 km to the east	Yes

11.4 POTENTIAL CUMULATIVE EFFECTS WITH THE SCHEME

Traffic and Transport

Design, Construction and Operation Phases

- 11.4.1 The embedded and additional mitigation proposed as part of the Transport Assessment and the Traffic and Transport ES chapter provide adequate mitigation of the potential transport effects posed to the site. The development will not cause any significant adverse environmental impacts to the site, the wider area, and will therefore not materially affect traffic and transport outside of the study area. The measures suggested aim to provide a better connection and safety in the road by providing new rest areas within the Strategic Road Network (SRN).
- 11.4.2 It is considered that there will be no adverse cumulative impacts associated with any development within the area from a traffic and transport perspective. All developments should adhere to the same principles outlined in the NPPF with regard to reducing traffic and promote sustainable transportation.

Noise

Design, Construction and Operation Phases

- 11.4.3 Once properly mitigated, it is anticipated that noise impacts are very local in effect and, given that the noise and vibration impacts resulted in negligible effects, it is anticipated that no cumulative effects will impact the area. Besides, the review of the cumulative schemes revealed that none are sufficiently close to the Proposed Development (i.e. have a direct line of sight to the site or are directly adjacent buildings or are within approximately 50m of the site).

Air Quality

Construction

- 11.4.4 It is anticipated that cumulative effects are unlikely to occur due to best practice mitigation measures included within the Proposed Development and the proposals and distances between them. The closest site from the Proposed Development (19/02146/FUL) is already partially developed and the remainder are located a considerable distance from the site boundary.

Operation

- 11.4.5 Given that the traffic data used during the Air Quality assessment considered all committed developments in the area, the results of the ES chapter, along with their appendices, present the worst-case scenario and includes the potential cumulative impacts.
- 11.4.6 There are no other sources of cumulative air quality impacts other than from traffic emissions.

Landscape and Visual

Design, Construction and Operation Phases

- 11.4.7 The GLVIA 3 states that: 'In terms of the timescale of proposals for inclusion, existing schemes and those under construction should be included in the baseline for both landscape and visual effects assessment (the LVIA baseline).'

- 11.4.8 This applies to the cumulative sites identified as Studley Grange Garden and Leisure Park (19/02146/FUL). Given that Wichelstowe Development (S/13/1524) and Land To The Rear Of Woodland View (S/OUT/20/0556) have been granted permission, they will be likely to be under construction during the Proposed Development construction timescale and therefore, these developments have also been considered.

- 11.4.9 However, it has been concluded that these developments will not lead to any cumulative landscape and visual effects both during the construction and operational stages as neither of these sites can be seen in combination with the Proposed Development due to intervening topography, dense vegetation, built form and long distances from the site.

Hydrology, Flood Risk and Water

Design, Construction and Operation Phases

- 11.4.10 The embedded and additional mitigation measures proposed as part of the Flood Risk Assessment, the Sustainable Drainage Report and the Surface Water Management Plan provide adequate mitigation of the potential flood and drainage risk posed to the site. Therefore, there are no inherent cumulative impacts that will remain.
- 11.4.11 As a result of the aforementioned mitigation and management measures, the development will not cause any significant adverse environmental impacts to the site, the wider area, and will not increase flood risk outside of the site. The measures suggested aim to provide a betterment to the catchment and will not influence the flood risk to other developments in the area.
- 11.4.12 It is considered that there will be no adverse cumulative impacts associated with any development within the area from a flood risk and drainage perspective. All developments should adhere to the same principles outlines in the NPPF with regard to reducing flood risk and liming surface water runoff.
- 11.4.13 The only cumulative impacts in terms of flood risk and surface water may be beneficial in terms of further attenuating and restricting surface water runoff into the nearby watercourses, and improvements in water quality from appropriate sustainable drainage (SuDS) design.

Ecology

Design, Construction and Operation Phases

- 11.4.14 The embedded and additional mitigation measures proposed as part of the ES chapter provide adequate mitigation of the potential ecology effects posed to the site. As a result of this, the Proposed Development will not cause any significant adverse environmental impacts to the site, the wider area, and will therefore not affect ecology and biodiversity outside of the site. The measures suggested aim to compensate and enhance existing habitats as well as create new habitats.
- 11.4.15 It is considered that there will be no adverse cumulative impacts associated with any development within the area from an ecology perspective. All developments should adhere to the same principles outlines in the NPPF with regard to improve and protect biodiversity and habitats, and it is expected that some will seek to achieve a Biodiversity Net Gain.

11.5 POTENTIAL SYNERGISTIC EFFECTS

- 11.5.1 As outlined previously, synergistic effects are the effects which in isolation may only represent a slight effect upon a receptor, but in conjunction with the other effects arising from the topic assessments, may represent a greater effect and need to be given further consideration.
- 11.5.2 The synergistic effects assessment (Tables 11.2) identified a number of in-combination effects on a single receptor or group of receptors, as is the case for local residents and wider community, landscape and ecological assets. However, primarily for the timescale reasons, synergistic effects are not considered to be magnitudenally greater than those effects identified by individual topic chapters within this ES and as such no additional mitigation or compensation is considered to be required.

- 11.5.3 This shows that during construction, a synergistic effect could occur to local residents through the interaction of noise, traffic, visual, landscape and air quality effects. This is not unusual for construction phase projects, and each element will be controlled as far as possible through measures set out in the CEMP.
- 11.5.4 There will also be a slight adverse synergistic effect to the wider landscape level through landscape, visual and ecological impacts. This will be short-term, and mitigated as far as practical through retention of vegetation.
- 11.5.5 There have been no synergistic effects identified during the operational phase.

Table 11.2. Synergistic Effects – Construction Phase

Nature of Effect (Post Additional Mitigation)	Receptor Group		
	Local Residents	Wider Community	Landscape Features and Designations (e.g. local footpaths, woodland)
Transport Construction Traffic	Minor, adverse		-
Noise Construction noise	Minor, adverse	-	-
Landscape Features Changes to landscape features and character areas	Slight, adverse	-	Slight, adverse
Visual Effects Visual effects from selected viewpoints	Slight, adverse	-	Slight, adverse
Air Quality Construction effects	Slight, adverse		
Ecology Habitat and biodiversity effects	-	-	Slight, adverse

Chapter 12: Conclusion

Environmental Statement: Volume 1

784-B048803

12.0 CONCLUSION

12.1 INTRODUCTION

- 12.1.1 An Environmental Impact Assessment (EIA) has been undertaken for the Proposed Development of Swindon Services, within Wiltshire Council, which has included an assessment of the likely environmental effects of those aspects of the environment with the potential to be affected.
- 12.1.2 Detailed below are the conclusions of the post mitigation effects assessments from each of the technical chapters, together with a table summarising how all the proposed mitigation measures could be secured.
- 12.1.3 An assessment of the Proposed Development in respect to the 'scoped in' areas of potential environmental concern has shown the majority of the construction and operational stage effects identified can be appropriately mitigated and reduced to a level which is not considered to be significant.
- 12.1.4 Nonetheless, some residual effects, both positive and adverse effects were identified following the implementation of additional mitigation. These are summarised below and in Section 15.12 together with Table 12.1 which outlines how all proposed additional mitigation measures could be secured.

12.2 TRANSPORT AND ACCESS

- 12.2.1 The Traffic and Transport ES chapter is presented in **Volume 1, Chapter 5: Traffic and Transport** and it assesses the likely significant effects of the Proposed Development on the environment in respect of Traffic and Transport during the construction and operational phases. This is supported by **Appendix 5.1: Transport Assessment (TA)**.

Construction Phase

- 12.2.2 During the construction phase, increase in traffic is expected due to the delivery of materials and products transported by HGVs, as well as the movements of workers associated with the construction of infrastructure. Even though it the timing and generation of construction traffic is not yet known and will depend on the contractors associated with the build out of the development, HGVs will avoid local road network and sustainable transports will be promoted for workers, resulting in a negligible impact.
- 12.2.3 Therefore, the Traffic and Transport ES chapter did not identify any significant effects at the construction phase of the Proposed Development except for the short section of the B4005 where the effects are potentially significant in relation to the increase in HGV volumes. As such no additional mitigation measures are required. Nonetheless, an outline Construction Environmental Management Plan (CEMP) which covers access routes and arrangements for vehicles, vehicle size and schedule of use, necessary highway works, parking and loading arrangements is being submitted as part of this outline planning application, together with Traffic Management Orders, proposed hoarding, pedestrian and cyclist safety, proposed working hours and proposed start and end dates for each phase of construction.

Operational Phase

- 12.2.4 Motorway Rest Areas (MRA) are typically not considered to be a trip generator but primarily an attractor of a proportion of existing passing traffic. The deviation caused by the MRA was analysed by undertaken a net impact exercise to identify the areas of the network which may be significantly affected following the construction phase of the site. It takes into account 12 links of the road network which could potentially be affected by the Proposed Development. This assessment demonstrates that excluding the site access road, the local road network between Junction 16 and the proposed site access is predicted to experience a maximum increase in light vehicle traffic of 28.4% and an increase in HGV traffic of 166%. Despite this increase and considering the mitigation measures proposed, this assessment along with the **Appendix 5.1: Transport Assessment (TA)** has demonstrated that the road network will not be significantly impacted by the Proposed Development on severance, driver delay, pedestrian delay and non-motorised user amenity, fear and intimidation, and road safety.
- 12.2.5 Furthermore, it is important to recognised the benefits from the provision of a new motorway rest area in terms of providing a rest stop and appropriate amenities for existing drivers, resulting in safety conditions on roads for the users of the Strategic Road Network .

12.3 NOISE AND VIBRATION

- 12.3.1 The assessment of noise and vibration is presented in **Volume 1, Chapter 6: Noise and Vibration** and considers the effects on the Proposed Development during the construction and operational phases.

Construction Phase

- 12.3.2 Given the early stage of the Proposed Development and the limited information in terms of construction equipment, locations and timetabling of construction related activities, it is not possible to predict construction noise levels effects. Nonetheless, noise and vibration from the construction phase will be controlled through the CEMP which will ensure that all construction work is carried out in accordance with good practice. During the construction phase, it is anticipated that through appropriate mitigation (suitable design practices adhered to by the Contractor) potentially significant noise effects can be minimised so that residual significant effects would not arise.
- 12.3.3 There is sufficient distance between the site and nearest receptor to lead to adverse vibration effects.

Operational Phase

- 12.3.4 At the operational phase of the Proposed Development the traffic related effects from Swindon such as traffic movements off-site and on-site have been identified to result in negligible effects for those identified receptors as such. The mechanical plant will also be designed to keep noise levels under the threshold established within the ES chapter at which will result in negligible effects. No further mitigation procedures are proposed.

12.4 AIR QUALITY

- 12.4.1 The Air Quality Assessment presented in **Volume 1, Chapter 7: Air Quality**, assesses the air quality and dust effect associated with the construction works. This chapter is supported by a **Figure 7.1: Site Context and Dispersion Modelling Extents** and technical appendices (**Appendix 7.1 to 7.6**) presented in **ES Volume 2**.

Construction Phase

- 12.4.2 The main emissions associated with the construction works have been identified to be dust and particulate matter generated during earth moving which may arise from vehicle movements, soiling of the public highway or windblown stockpiles. The potential effects associated with dust nuisance and surface soiling have been identified to be negligible for all residential receptors and not significant on the basis that appropriate measures would be secured via a CEMP. This would include measures in relation to dust management and proposed earthworks as well as communications with the nearby receptors.

Operational Phase

- 12.4.3 Using the provided traffic data, the effect of the Proposed Development is predicted to be negligible at all receptors in the assessment year of 2027. While no mitigation is required, best practice measures are included within the site, which will seek to promote sustainable transport for workers by providing a shared cycle and pedestrian access that will allow pedestrians and cyclist to be connected with the existing pedestrian and crossing infrastructure at Junction 16 and consequently, transport services and additional infrastructure. Furthermore, the inclusion of EV 50 high-powered EV charging stations and the potential to facilitate 100% EV charging capability for all vehicles will promote the use of electric vehicles and therefore will enhance air quality in the area.

12.5 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

- 12.5.1 The landscape and visual effects presented in **Volume 1, Chapter 8: Landscape and Visual Impact Assessment** have been assessed in accordance with industry best practice guidance set out in Guidelines for Landscape and Visual Impact Assessment¹ and have assessed the effects associated with the Proposed Development on local and wider landscape, its character, scenic quality, visual amenities and people's views onto the Proposed Development.

- 12.5.2 The assessment is supported by **Appendix 8.1: Baseline Figures** and **8.2: Viewpoint Photographs** that can be found in **Volume 2** of the ES.

Construction Phase

- 12.5.3 Construction effects are those resulting from the temporary construction works associated with the build out of Swindon Services. The majority of the vegetation to be removed is internal arable grassland and not focused on the site periphery where the visible and more habitat rich landscape typologies are located, resulting therefore in minimal adverse impacts. Mitigation measures will be assured through the production of a CEMP and the high quality design of the site which will consider

topography and vegetation as visual barriers. Despite these best practice measures, there would remain some adverse effects during the construction phase. Adverse effects will result from:

- Site area change from the existing landscape typology of agricultural grassland to hoarded site with construction compound, vehicular routes and plant machinery Ground preparation work, the manipulation of landform and materials storage;
- Physical Landscape Resource and Habitat; and
- Representative views for road users from viewpoints 1, 2 and 4.

Operational Phase

- 12.5.4 The design and architecture of the buildings will be developed sensitively to minimize the visual effects during the operational phase, and it will contain a green roof in order to soften the visual impact, reduce glare and create new habitats. With these measures implemented, a minor beneficial effect will arise from the change of landscape typology of agricultural grassland to the Proposed Development. A sensitive lighting strategy along with an enhancement of habitats and therefore biodiversity will be also undertaken, resulting in an intermediate beneficial effect. The representative views for road users from viewpoints 1, 2 and 4 will remain during operation phase as a minor adverse effect.

12.6 HYDROLOGY, FLOOD RISK AND WATER

- 12.6.1 An assessment of hydrology and flood risk has been undertaken in **Volume 1, Chapter 9: Hydrology, Flood Risk and Water** and considers the likely effects of the Proposed Development in terms of flood risk, risk of pollution to controlled waters and hydrology. This chapter is supported by a Flood Risk Assessment and a Sustainable Drainage Report found in **Volume 2, Appendix 9.1 and Appendix 9.2**.

Construction Phase

- 12.6.2 Effects during the construction phase are changes to natural drainage regime, pollution risk and flood risk impacts. However, mitigation measures will be secure through a CEMP and water management and quality drainage design, reducing risks of adverse impacts in the area. Furthermore, the Proposed Development will be located within Flood Zone 1, avoiding development within areas prone to flooding and a suitable space has been allocated to allow sustainable drainage systems (SuDS) to be implemented.

- 12.6.3 The hydrology assessment identified that with the implementation of embedded mitigation measures, the effects and impact associated with construction phase are minor adverse which is not significant.

Operational Phase

- 12.6.4 The possible impacts of the Proposed Development during the operational phase may include increases in impermeable area, increases in contamination sources and foul discharge from the site

¹ Guidelines for Landscape & Visual Impact Assessment' 3rd Edition.

occupants. After the additional mitigation measures, the operational phase of the Proposed Development may result in the following minor beneficial effects:

- Impact on runoff quantity; and
- Impact on runoff quality.

12.6.5 The FRA produced in conjunction with the Sustainable Drainage Report were designed to mitigate the increase of surface water run-off from this site through the provision of SuDS schemes. These would provide both attenuation storage and treatment of the surface water prior to discharge to the downstream watercourse.

12.6.6 The scheme has been designed to accommodate peak storm events up to and including the 1 in 100-year return period with an additional allowance of 40% increase in rainfall intensity for climate change.

12.6.7 Following the implementation of the mitigation measures identified, the potential effects associated with flood risk and water quality have been identified as negligible and not significant.

12.7 ECOLOGY

12.7.1 The ecological impact assessment (EcIA) was undertaken in accordance the Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment (2019)² and is presented in **Volume 1, Chapter 10: Ecology**. This assessment is supported by six technical appendices presented in **Volume 2, Appendices 10.1 and 10.6**.

12.7.2 Potential effects associated with construction works include potential for the loss and disturbance to habitats and species.

Construction Phase

12.7.3 Effects on bats, biodiversity and habitats were identified during the construction phase as an intermediate significant effect. For this reason, impact avoidance and biodiversity enhancement have been sought in the first instance by design by retaining and enhancing key habitat areas on the site including woodland and hedgerows, with new and additional boundary habitats.

12.7.4 In order to comply with local and government policy to achieve a minimum of 10% biodiversity net gain, an incorporation of a biodiversity enhancement area will be provided to the immediate east of the site to compensate for loss of biodiversity within the site and lead to an enhancement overall.

12.7.5 Furthermore, further measures will be secured via a CEMP. These measures will include minimising habitat removal and the protection of retained habitats and construction measures to prevent pollution and light spillage on sensitive areas.

12.7.6 Following implementation of mitigation, effects on all receptors are considered to be non-significant. A District License for great crested newts will be secured to ensure the favorable conservation status of the species is maintained.

Operational Phase

12.7.7 At the operational phase following the mitigation measures, some residual effects are identified in relation to birds and biodiversity net gain. The new biodiversity enhancement area, along with the incorporation of features for foraging and nesting bird species will improve the overall quality of the habitat and will result in a minor positive effect.

12.7.8 Following implementation of mitigation measures and landscape management options, effects on all other receptors are considered to be non-significant.

12.8 SUMMARY

12.8.1 An assessment for the Proposed Development in respect to the scoped in areas of potential environmental concern has shown that if the identified additional mitigation is implemented during the design, construction and operational stages of the development, the majority of adverse operational and construction effects identified can be appropriately mitigated or compensated and reduced to a level which is not considered to be significant. Table 12.1 summarises additional mitigation measure recommendations, together with an indication of how these can be secured.

^{2,2} CIEEM (2019). Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. Version 1.1 Updated September 2019. Chartered Institute of Ecology and Environmental Management, Winchester.

Table 12.1. Summary of Additional Mitigation Measures and How They will be Secured and Monitored

Identified Effect where additional mitigation (Not design mitigation) has been identified	Type of additional mitigation measures (e.g. prevent, reduce, offset, enhance)	Means by which mitigation measure may be secured	To be delivered by
<u>Traffic and Transport</u>			
Operation			
Highway/footway improvements	Improvements to the highway, comprising a potential link to a footway outside the southern boundary of the Site, adjoining the B4005.	Discussions with the Applicant, Council and Highways Department	Applicant and/or appointed contractor
<u>Noise and Vibration</u>			
Construction			
Construction Noise	Prevent and reduce. Inclusion of mitigation measures in Construction Environmental Management Plan.	CEMP, Planning Condition	Applicant and/or appointed contractor
<u>Landscape and Visual</u>			
Construction			
Change from existing landscape typology of agricultural grassland to hoarded site with construction compound.	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area.	Planning Condition	Applicant and/or appointed contractor
Viewpoint 1: Site hoarding and construction compound, machinery and equipment clearly visible.	Minimise construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	CEMP, Planning Condition	Applicant and/or appointed contractor
Viewpoint 2: Construction site is easily visible.	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	CEMP, Planning Condition	Applicant and/or appointed contractor
Viewpoint 4: Construction site is clearly visible.	Retain and protect existing field pattern and hedgerow boundaries. Minimise Construction area. Site hoarding to be designed sensitively to ensure it integrates with surroundings	CEMP, Planning Condition	Applicant and/or appointed contractor
Operation			
Change from existing landscape typology of agricultural grassland to hard paved parking areas, associated services buildings and landscape.	Enhance habitat and landscape periphery with tree and scrub planting. New habitat creation provided in east field.	Habitat management plan, Planning Condition	Applicant, Ecologist
Viewpoint 1: Site buildings and vehicular parking are visible.	Green roofs on buildings, SuDS landscape planting and trees / hedgerows in internal site areas further soften views of the vehicular parking and buildings. Controlled lighting systems and baffled fittings ensure lighting at night is muted and sympathetic.	Reserved Matters Application	Applicant, Design team

Viewpoint 2: Site is easily visible.	Green roofs on buildings, SuDS landscape planting and trees / hedgerows in internal site areas further soften views of the vehicular parking and buildings. Controlled lighting systems and baffled fittings ensure lighting at night is muted and sympathetic.	Reserved Matters Application	Applicant, Design team
Viewpoint 4: Eastern boundary of Site is clearly visible	Green roofs on buildings, SuDS landscape planting and trees / hedgerows in internal site areas further soften views of the vehicular parking and buildings. Controlled lighting systems and baffled fittings ensure lighting at night is muted and sympathetic.	Reserved Matters Application	Applicant, Design team

Hydrology, Flood Risk and Water

Operation

Impact on runoff quantity	Implementation of a drainage strategy and SuDS (use of CIRIA SuDS Manual)	Reserved Matters Application/Planning Condition	Applicant, Design team
Impact on runoff quality	Implementation of a drainage strategy and SuDS (use of CIRIA SuDS Manual)	Reserved Matters Application/Planning Condition	Applicant, Design team

Ecology

Operation

Achievement of Biodiversity Net Gain	Implementation of a biodiversity enhancement area to improve overall quality of habitat and achieve over 10% of biodiversity net gain.	Habitat management plan, Planning Condition	Applicant, Ecologist
Enhancement of bird habitat	Leaflets and signage to be provided to educate residents on value of the habitat.	Habitat management plan, Planning Condition	Applicant, Ecologist