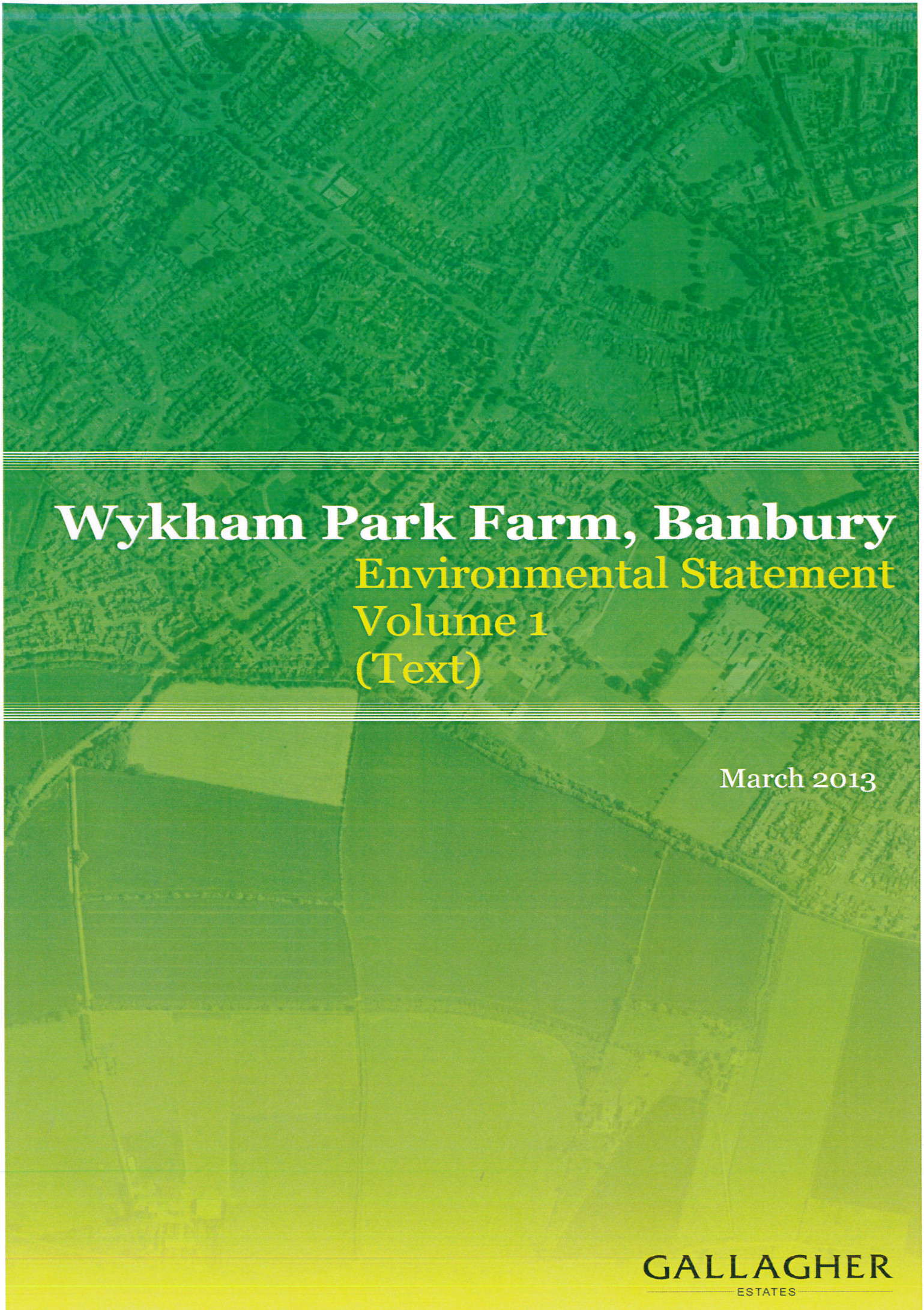


Wykham Park Farm, Banbury

Environmental Statement
Volume 1
(Text)

March 2013

GALLAGHER
ESTATES

Wardell Armstrong
Thynne Court, Thynne Street, West Bromwich, West Midlands, B70 6PH, United Kingdom
Telephone: +44 (0)121 580 0909 Facsimile: +44 (0)121 580 0911 www.wardell-armstrong.com

DATE ISSUED: **March 2013**
JOB NUMBER: **WM10671**
REPORT NUMBER: **VOL-001**

GALLAGHER ESTATES LTD

Wykham Park Farm, Oxfordshire

Environmental Statement Volume 1 (Text)

March 2013

PREPARED BY:
Wardell Armstrong LLP

David Lock Associates

Savell Bird & Axon

ISO 9001 REGISTERED FIRM | ISO 14001 REGISTERED FIRM | OHSAS 18001 REGISTERED FIRM

Wardell Armstrong is the trading name of Wardell Armstrong LLP, Registered in England No. OC307138.

Registered office: Sir Henry Doulton House, Forge Lane, Etruria, Stoke-on-Trent, ST1 5BD, United Kingdom

UK Offices: Stoke-on-Trent, Cardiff, Edinburgh, Greater Manchester, London, Newcastle upon Tyne, Sheffield, Truro, West Bromwich. International Offices: Moscow, Almaty

VOLUME 1 – ENVIRONMENTAL STATEMENT (TEXT)

CONTENTS

VOLUME 2 – DRAWINGS, FIGURES AND APPENDICES

DRAWINGS

FIGURES

APPENDICES

B2.1 Landmark Envirocheck Report

B3.1 Flood Risk Assessment – Wardell Armstrong 2012
B3.2 Surface and Ground Water WFD Results from the Thames RBMP

B5.1 Traffic Flow Information
B5.2 Wind Rose Data for Bedford – 2009
B5.3 Model Verification Procedure
B5.4 Uncorrected PM_{10} Pollution Concentrations
B5.5 Corrected NO_2 Pollution Concentrations

B6.1 Traffic Data Used Within the Noise Modelling
B6.2 Noise Monitoring Results
B7.1 Target Notes
B7.2 Summary of Species (Fauna) Protection and Legislation
B7.3 Hedgerow Assessment
B7.4 Badger Report - ***Confidential Badger Appendix – submitted separately to the Local Planning Authority***
B7.5 TVERC Designated Sites Map
B7.6 Summary of Criteria for Nature Conservation Evaluation
B7.7 GCN Mitigation Strategy
B7.8 Reptile Method Statement

B9.1 Heritage Assets
B9.2 Geophysical Survey Report
B9.3 Impact Assessment Methodology

GLOSSARY OF TERMS

Abbreviations

ALC	Agricultural Land Classification
AMR	Annual Monitoring Report
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekly Traffic
ALHV	Area of Landscape of High Value
AGHV	Area of Great Landscape Value
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
BAP	Biodiversity Action Plan
BGS	British Geological Survey
BS	British Standard
BREEAM	Building Research Establishment Environmental Assessment Method
CAMS	Catchment Abstraction Management Strategies
CDC	Cherwell District Council
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Group
CRTN	Calculation of Road Traffic Noise
dB	Decibel
DDA	Disability Discrimination Act
DLA	David Lock Associates
DEFRA	Department of the Environment, Food and Rural Affairs
DETR	Department of the Environment, Transport and the Regions
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EIA	Environmental Impact Assessment
ES	Environmental Statement
EU	European Union
FRA	Flood Risk Assessment
GSPZ	Ground Source Protection Zone
ha	Hectares
HER	Historic Environment Record
HGV	Heavy Goods Vehicles
IAQM	Institute of Air Quality Management

LAQM	Local Air Quality Management
LEAP	Local Equipped Areas of Play
LGV	Light Goods Vehicles
LLFA	Lead Local Flood Authority
LSCA	Landscape Sensitivity and Capacity Assessment
LWS	Local Wildlife Site
m AOD	metres above ordnance datum
mm/s	millimetres per second
MAFF	Ministry of Agriculture, Fisheries and Food
MAGIC	Multi-Agency Geographic Information for the Countryside
NAQS	National Air Quality Strategy
NEAP	Neighbourhood Equipped Areas of Play
NERC	Natural Environment and Rural Communities
NHBC	National House Building Council
NPPF	National Planning Policy Framework
NPSE	Noise Policy Statement for England
NRTF	National Road Traffic Forecast
NSCLP	Non-Statutory Cherwell Local Plan
ONS	Office for National Statistics
OWLS	Oxfordshire Wildlife Landscape Study
PPG	Planning Policy Guidance note
PPS	Planning Policy Statement
RSS	Regional Spatial Strategy
SA	Sustainability appraisal
SBA	Savell Bird and Axon
SGN	Scotia Gas Networks
SPD	Supplementary Planning Document
SuDS	Sustainable Urban Drainage System
SWMP	Site Waste Management Plan
TA	Transport Assessment
TGNPPF	Technical Guidance National Planning Policy Framework
TVERC	Thames Valley Environmental Records Centre
TWUL	Thames Water Utilities Limited
VM	Virgin Media
WCS	Water Cycle Study

WFD	Water Framework Directive
WHO	World Health Organisation
WPD	Western Power Distibution
WRMU	Water Management Research Unit

TECHNICAL AND SPECIALIST TERMS

1,3-butadiene	An organic compound emitted into the atmosphere from petrol and diesel vehicles - a product of the combustion of olefins. A known human carcinogen.
abstraction	Removal of water from surface water or groundwater, usually by pumping.
ADMS-Roads	software for modelling road traffic emissions
air quality objective	Objectives are policy targets generally expressed as a maximum ambient concentration to be achieved either without exception or with a permitted number of exceedances, within a specified timescale.
air quality standard	Standards are set for the concentrations of pollutants in the atmosphere which can broadly be taken to indicate level of environmental quality. The standards are based on assessment of the effects of each pollutant on health, including the effects on sensitive sub-groups.
ambient air	The air occurring at a particular time and place outside buildings.
annual mean	The average of the concentrations measured for each pollutant for one year.
anthropogenic	The portion of carbon dioxide in the atmosphere that is produced directly by human activities.

aquifer	A water-bearing bed of rock strata, holding water either by virtue of its porosity or because it is pervious.
archaeology	The study of the human past through material remains.
attenuation	Reduction.
balancing ponds	Ponds designed to attenuate flows by storing run-off during a storm and releasing it at a controlled rate during and after the storm.
base flow	The water that comes from groundwater discharging in to the river.
bat roost	Any location in which bats rest or breed.
Biodiversity Action Plan	The UK Government's plan for the protection and sustainable use of biodiversity, published in 1994. It represents a commitment to joint action nationwide through the securing and better use of resources.
biodiversity	The variety of life expressed through the diversity of habitats, the species which live in them, and the natural variation in the genetic constitutions of these species.
BREEAM	certificated assessment enabling developers and designers to demonstrate environmental credentials of their buildings.
bund	A protective structure used to prevent the spillage and dispersal of potentially contaminative liquids, such that if the original container failed there would be no spillage onto surrounding ground. A health and safety preventative measure.
carbon monoxide (CO)	A colourless, odourless gas resulting from the incomplete combustion of hydrocarbon fuels. CO interferes with the

	blood's ability to carry oxygen to the body's tissues and results in adverse health effects.
catchment	The area contributing flow to a point on a drainage system.
climate change	changes in the earth's climate over the last hundred years. Some of the recent shifts in global temperature are thought to be the result of man-made green-house gases.
common	'Waste' ground where medieval tenants held certain rights, the most frequent being common of pasture.
Confluencing	the merging of two things i.e. rivers
Conservation Area	Area identified by the local authority as of particular architectural and/or historic quality and subject to planning constraints.
Construction Environmental Management Plan	A site specific document to ensure environmental management practices are followed during the construction phase.
controlled waste	a waste that is subject to legislative control in either its handling or disposal and can be categorised as either household, industrial or commercial waste.
copse	A small area of woodland (not necessarily one that has been coppiced).
crown spread	Extent of tree canopy.
cumulative	Increasing or enlarging by successive addition.
culvert	a sewer or channel crossing under a road or railway.

decibel (dB)	A unit of noise level derived from the logarithm of the ratio between the value of sound pressure intensity, and a corresponding reference value. The Decibel scale provides a linear numbering scale compressing a wide range of amplitude values to a small set of numbers. The threshold of normal hearing is in the region of 0dB, and the threshold of auditory pain lies between 120 and 140dB. Measurements in dB broadly agree with peoples assessment of loudness, with a change of ± 3dB being the minimum perceptible under normal environmental conditions, and a change of ± 10dB corresponding roughly to a halving or doubling of loudness.
dB(A)	Human hearing is not equally sensitive to all frequencies. The A-weighting therefore attenuates low frequencies, which are less readily detectable by humans and, to a lesser extent, high frequencies (i.e. > 4kHz) which also require progressively higher sound levels for detection by the human hearing system as the frequency is raised
desk-based assessment	Assessment of the known and potential archaeological resource of a specified area based on existing written and pictorial information.
Design and Access Statement	Is a short report that explains the design thinking behind a planning application
dewatering	The removal of naturally occurring water from excavated trenches.
development platform	Proposed ground level of an area of land to be developed.
discharge	volume of water passing through a cross-section of the river in a unit of time

dispersion modelling	The use of a dispersion model is a means to calculate air pollution concentrations giving information about emissions and the nature of the atmosphere. It is used to model whether ground level concentrations of pollutions at a certain distance from the source are likely to result in an exceedance of the air quality objective for that pollutant.
drift	Sediment laid down by or in association with glacial ice, or general term applied to surface geology.
droveway	A drovers' road, drove or droveway is a route for driving livestock on foot from one place to another,
earthwork	Bank, mound, terrace, ditch, depression or similar manmade feature visible on the surface.
Environmental Protection Act 1990	An Act to make provision for the improved control of pollution arising from certain industrial and other processes, to re-enact the provision of the Control of Pollution Act 1974 but with modifications.
evaluation	In archaeology, a limited programme of intrusive or non-intrusive fieldwork, which determines the presence or absence of archaeological features and provides sufficient data to allow an assessment of their worth.
exceedance	The amount by which something exceeds a standard or permissible measurement
extended Phase 1 habitat survey	A survey which maps the habitats and notable ecological features of a site and provides information on the presence or potential for protected species.
farmstead	Small settlement, usually a single dwelling, with agricultural enclosures and structures

field capacity	the maximum amount of water that a particular soil can hold.
flood risk	A combination of the probability and frequency occurrence of harm being realised from a flood hazard.
flood risk assessment	A formal consideration of flood risk at a particular site, or across a particular catchment. Required to be submitted to accompany planning applications for development sites that are at risk of flooding and could increase the flood risk to surrounding areas. The scope and content of the FRA is enclosed in the National Planning Policy Framework.
flood plain	Land adjacent to a watercourse that would be subject to regular flooding under natural conditions.
fluvial	Relating to rivers and their flow.
foul water	Used water from any domestic, commercial or industrial activity.
geophysical survey	A range of methods used to detect buried archaeological remains without excavation, by measuring magnetic responses or electrical conductivity.
glimpse	A faint and transient appearance, momentary or imperfect view.
groundwater	Water that has percolated into the ground. It includes water in both the unsaturated zone and the water table.
groundwater regime	Groundwater system.
groundwater vulnerability	The risk to groundwater from pollution.

habitat	The space occupied by a community of plants and animals.
haul roads	Temporary roads constructed for the access and safe movement of plant/machinery.
hectare (ha)	1 hectare is equivalent to approximately 2.4 acres.
improved grassland	Meadows or pastures which have been affected by heavy grazing, drainage or application of herbicides, slurry or manure, to the extent that they have lost many species associated with unimproved pastures.
infiltration	The passage of surface water through the surface of the ground.
infiltration SuDS Techniques	Systems, or devices, specifically designed to promote the passage of surface water into the ground.
intervisibility	The possibility of seeing between locations.
L_{Aeq}	Equivalent Continuous Sound Level. The $L_{Aeq, T}$ is the notional steady sound which, at a given position and over a defined period of time, T, has the same A-weighted acoustic energy as the actual fluctuating sound
landfill	The engineered deposit of waste into or onto land.
landscape feature	organic, naturally occurring element such as a tree or stream; or a man-made feature that mimics naturally occurring elements such as a constructed pond.
landscape character	The physical, historical and cultural qualities of land use and settlement within an area.

listed building	A building or structure protected by law due to its special historic and/or architectural importance.
Local Plan	A plan prepared under the Town and County Planning Act 1990. A Local Plan articulates the strategic policies of the Structure Plan at district level. A Local Plan will include policies and proposals for individual sites and these will be shown on a Proposals Map.
Local Vernacular	A local style in which ordinary houses are built
made ground	Land engineered or constructed by man, either through reclamation or use of artificial fill such as refuse.
main river	Watercourse designated by Government as such on main river maps. Usually larger streams or rivers, but also smaller watercourses of strategic drainage importance.
Masterplan	A product of land use planning.
mitigation	Reduction of intensity or severity.
mode	Form/type.
National Planning Policy Framework	National planning policies are set out in the National Planning Policy Framework, published March 2012.
nature conservation	Policies and programmes for the long-term retention of natural and semi-natural communities under conditions which provide the potential for continuing evolution.
Neolithic	A period relating to the later part of the Stone Age, when ground or polished stone implements prevailed.

nutrients	a substance that provides nourishment essential for growth and maintenance of life.
neutral grassland	Meadows/pastures with plant communities which occur on neutral soils (pH 5.5-7.0).
Olfactory	Relating to or contributing to the sense of smell
oxides of nitrogen	Combustion processes emit a mixture of oxides of nitrogen, primarily nitric oxide (NO) and nitrogen dioxide (NO_2), collectively known as Nox. NO_2 has a variety of environment and health effects.
parameters	a numerical or other measureable factor forming one of a set that defines a system or sets the conditions of its operation.
particulate matter (PM_{10} and $PM_{2.5}$)	Airborne particulate matter is made up of a collection of solid and/or liquid materials of various sizes. Particulate matter is classified according to its size. PM_{10} is concentration of particles that are less than or equal to 10 µm in diameter; $PM_{2.5}$ the concentration of particles that are less than or equal to 2.5 µm in diameter.
permeability	The ability of rock, soil or made ground to allow fluids to flow through it through their pores and fractures. Measured as a rate of flow.
Planning Statement	A document which accompanies a planning application providing supporting information and seeks to illustrate that the development proposals either meet relevant planning policies and outlines items which the planning authority should take into account in reaching their decision on the planning application.
Planning Policy	PPGs were issued by central Government and set out

Guidance Notes	guidance on a series of topics. These have been superseded by the National Planning Policy Framework.
pond	Permanently wet depression either occurring naturally or artificially designed to retain storm water for several days and permit settlement of suspended solids.
potable water	Clean water suitable for human consumption.
prehistoric	Dating to before the Roman Conquest of 43AD.
protected species	Animals and plants which are protected through UK or EU statute, principally by various schedules of the Wildlife and Countryside Act 1981 and amendments.
public rights of way	certain routes which the public has a right to access e.g. footpath, bridleway.
Red Data Book	Information on species in danger of extinction, nationally or locally, are published in Red Data Books.
Regional Planning Guidance	RPGs are issued by central Government for each region. RPG's articulate PPG guidance in the context of each region. In the case of the South West Region, the current RPG is RPG10 published in September 2001. RPG's do not form part of the statutory development plan but Structure and Local Plans must have regard to their content.
residual	The quantity left over at the end of a process; as in Impacts, the remaining or lasting effects after mitigation measures have been applied.
restoration	The act of restoring.

ridge and furrow	A series of alternating ridges and depressions giving a corrugated appearance, produced by repeated ploughing along the same path.
riparian	land immediately alongside a watercourse, stream or river.
run-off	Water that flows over the surface of the ground. This can occur if the ground is impermeable or if permeable ground is saturated.
Scheduled monument	A statutory designation pertaining to an archaeological or heritage site of national importance.
semi-improved grassland	Grassland which has been improved to a degree, but still retains some species indicative of less improved pasture.
sett	A hole dug by a badger; a place where it rests and sleeps; used as a place to rear cubs.
Site of Special Scientific Interest (SSSI)	A statutory nature conservation designation.
Special Areas of Conservation (SAC)	are strictly protected sites designated under the EC Habitats Directive.
species rich	A high range of plants and/or animals.
spoil	Refuse material removed from an excavation
stockpiling	Storage of excavated material, during the construction phase, prior to re-use.
strata	(Geological): a rock unit comprised of a series of layers (archaeological): a vertical sequence of archaeological deposits.

superficial geology	shallow deposits of soil and clay which overlie the solid rock geology
sustainability	The prudent use of resources by today's society to ensure that the needs of future societies are not compromised.
Sustainable Urban Drainage System (SuDS)	A sequence of management practices and control structures designed to drain surface water in a sustainable way.
surface water	Water collecting on or running off the ground surface.
sulphur dioxide	A corrosive acid gas which combines with water vapour in the atmosphere to produce acid rain which can damage vegetation, degrade soils, building materials and watercourses. It also has adverse human health effects.
suspended solids (SS)	Undissolved particles in a liquid.
TEMPRO	A spreadsheet based transport economic appraisal tool
tithe	A tax of one tenth of annual produce formerly levied for the benefit of the Church and clergy. This was converted to money payments after 1836, prompting a series of parish surveys, set out in a *tithe award* (map) and *apportionment* (list).
topography	Graphic representation of the surface features of a place, indicating their relative positions and elevations.
trackout	transport of dust and dirt by vehicles travelling from a construction site on to the public road network

treatment	Improving (the quality of water) by physical, chemical and/or biological means.
trial trenching	Archaeological excavation of a fixed size and number of trenches, distributed across the site based on existing information and the aims of the project.
tributary	A stream flowing into a larger river.
TRICS	A system that challenges and validates assumptions about the transport impacts of new developments
validation	confirming that the product meets the needs of its users.
Vista	A pleasing view
visual amenity	The pleasantness of a view.
waste hierarchy	ranks waste management options according to what is best for the environment
watching brief	Formal programme of archaeological observation and investigation made during any operation carried out for non-archaeological reasons.
watercourse	Any natural or artificial channel that conveys or is capable of conveying surface and/or groundwater.
Wildlife and Countryside Act 1981	National legislation which details protected plant and animal species, the circumstances under which they are protected.

A INTRODUCTION

A.1 INTRODUCTION AND BACKGROUND TO THE ENVIRONMENTAL STATEMENT

Terms of Reference

A.1.1 This Environmental Statement (ES) has been prepared on behalf of Gallagher Estates in connection with an outline planning application for a residentially led mixed-use development on approximately 50 hectares (ha) of land south of Banbury, Oxfordshire. The outline planning application has been submitted to Cherwell District Council (CDC) as the authority responsible for determining the application.

A.1.2 The Wykham Park Farm site is proposed as an urban extension to Banbury for up to 1000 dwellings together with a local centre including retail (A1), financial services (A2), restaurants (A3-A5), up to a combined total floorspace of 1,000m^2, employment space (B1) up to a total floorspace of 5,000m^2 with the B1(a) office component limited to a maximum of 2,500m^2 and associated car parking, a community primary school [including space for community uses (D1) and assembly and leisure uses (D2)], green infrastructure including formal and informal open space, amenity space, retained hedgerows, structural landscaping, supporting infrastructure [including gas, electricity, sewerage, water, telecommunications] sustainable urban drainage systems, new connection to the A361 Bloxham Road, pedestrian and cycling connections to the surrounding footpath and cycle network and any necessary demolition and ground remodelling.

A.1.3 The ES reports the findings of Environmental Impact Assessment (EIA) of the proposed mixed use development. The location of the site is shown on drawing A1.1 and the planning application boundary considered for the purposes of this ES on drawing A1.2. The Indicative Layout for the site is shown on the Parameter Plan drawing JJG043/27/B.

A.1.4 This ES considers the environmental effects of the proposed development of the land at Wykham Park Farm for mixed use and also the cumulative effects, where appropriate, of other areas in the locality of the site:

- Land South of Salt Way at Crouch Farm, Bloxham Road; and
- Longford Park.

A.1.5 The location of the sites considered as part of the cumulative impacts within the ES is shown on drawing number A1.3.

Requirement for Environmental Impact Assessment

A.1.6 This ES been prepared in accordance with the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011. Urban development projects fall within Schedule 2 of the 2011 Regulations – projects for which Environmental Impact Assessment (EIA) is not mandatory, but for which EIA may be appropriate, depending on the scale of the proposed project and the sensitivity of the site and its surroundings. Urban development projects involving more than 0.5 ha of land are classified as Schedule 2 projects by the 2011 Regulations. In this case, the applicants have considered the proposals and concluded that it is appropriate to carry out an EIA for the proposed development and to prepare this ES.

Structure of the ES and consultant team

A.1.7 The ES is divided into Part A (background and introduction to the development), Part B (technical assessment of the environmental effects) and Part C (conclusions). The ES has not been formally scoped however based on Wardell Armstrong's experience of preparing a number of similar ES's it was considered necessary to consider the assessment of environment effects for the areas outlined in Section B, paragraph A.1.8 below.

A.1.8 The ES has been compiled by Wardell Armstrong LLP and the sections dealing with the assessment of environmental effects were prepared by the consultant team Wardell Armstrong (WA), (David Lock Associates (DLA), Savell Bird & Axon (SBA)):

A1	Introduction	WA
A2	The proposed development	DLA
A3	The site and its environment	WA
A4	Planning policy	DLA
B	Assessment of environmental effects	
B1	Land use, agriculture and soils	WA
B2	Geology, minerals and ground conditions	WA
B3	Water resources	WA

B4	Traffic, transportation and access	SBA
B5	Air quality	WA
B6	Noise	WA
B7	Ecology and wildlife	WA
B8	Landscape and visual impact	WA
B9	Archaeology and cultural heritage	WA
B10	Waste and recycling	WA
B11	Public utilities and services	WA
B12	Socio-economic effects	DLA
B13	Sustainability and climate change	WA
C	Conclusions	WA

A.1.9 The ES comprises the following separately-bound parts:

- Volume 1 (this volume) – The text of the ES;
- Volume 2a - Drawings and Figures;
- Volume 2b - Appendices;
- Non-Technical Summary.

A.1.10 A Non-Technical Summary of the ES is provided as a separate document. It succinctly describes the proposed development, its potential impacts and proposed mitigation measures without the use of technical terms.

A.1.11 A glossary is of technical terms used in this ES is included (refer to contents page).

A.1.12 Where reference is made to specific documents and information used in the compilation of this ES, these documents are contained within the Appendices in Volume 2, which also contains Figures and Drawings referred to in this volume.

A.1.13 The Planning Application is supported by this ES and by other documents, including the following:

- Planning Statement prepared by David Lock Associates;
- Design and Access Statement prepared by David Lock Associates;
- Transport Assessment (TA) and Framework Travel Plan prepared by Savell

Bird & Axon; and

- Drainage Strategy and Flood Risk Assessment (FRA) prepared by Wardell Armstrong LLP.

A.1.14 The ES has been prepared in both conventionally bound version and as a CD ROM. The CD ROM version contains all the text, figures and appendices of the conventional version and is readable by most personal computers without the need for additional software. The text of the ES on the CD ROM document is capable of being searched for key words. The purpose of the CD ROM version is to make the ES available in a form which is both convenient and economical and which minimises the use of natural resources, thus being consistent with the principles of sustainable development.

A.2 THE PROPOSED DEVELOPMENT

Introduction

A.2.1 This section of the Environmental Statement describes:

- The proposed development including design principals and strategies which will support the landuses;
- The planning history of the site;
- The need for the proposed development;
- Consideration of alternatives;
- Pre-application consultations;
- Cumulative impacts which have been considered;
- Project programme.

Description of the Proposed Development

A.2.2 The planning application area for the Wykham Park Farm site covers approximately 50 ha. It is situated 1.7 km south of the town of Banbury, in Oxfordshire. The location of the site is shown on drawing number A.1 and an aerial photograph of the site on drawing number JJG043/011/A.

A.2.3 The ES references the following Parameter Plan drawing number JJG043/027/B, a planning application drawing which shows the indicative layout of the proposed development.

A.2.4 The outline planning application is for a residentially led mixed use development delivering:

- 1000 residential units (30.03 ha) which will include a proportion of affordable housing and will be a mix of types including houses, town houses, flats and apartments;
- 1.67 ha of commercial and employment use with ancillary offices and associated car parking located in the western part of the site with easy access from the proposed new junction with Bloxham Road. Employment will be B1 uses up to total floorspace of 5000m^2 with the (B1 (a) component limited to a maximum of 2,500m^2;
- A local centre (0.75 ha) including A1 (retail) , A2 financial, A3-A5 uses (food retail) – combined total floorspace of 1000m^2;

- A new one-form entry community primary school on an area of approximately (2.22 ha) to allow for expansion and including space for community uses (D1) and assembly and leisure uses (D2);
- Green infrastructure including retention and enhancement of significant hedgerows and woodland areas, where appropriate, strategic open space comprising parks with sports pitches, Neighbourhood Equipped Areas of Play (NEAP) and Local Equipped Areas of Play (LEAP); other informal areas of public open space and allotments and new structural landscape planting (13.96 ha); and
- Transport infrastructure comprising access from Bloxham Road (A361); public transport hub in the local centre, primary road network, public transport corridor and strategic pedestrian and cycle routes; and
- Associated infrastructure, lighting and sustainable urban drainage features.

Design of Scheme

A.2.5 A detailed description of the design of the scheme are provided in the Design and Access Statement and Planning Supporting Statement which accompanies the planning application. A summary of the key design details are provided in this section of the ES.

A.2.6 The design of the scheme has evolved from an initial review of the constraints at the site. The key site constaints identified at the site are listed below:

- The site borders a historic lane, the Salt Way;
- The site borders the A361 Bloxham road which has the potential to give rise to adverse levels of noise and vehicle pollutants;
- Existing large water mains cross the site;
- There are protected species using the site;
- There are habitats of beneficial for wildlife including hedgerows with mature trees;
- Views and setting of neighbouring properties (Crouch Cottages, Wykham Park Farm, Wykham Farm, locally important parkland around Tudor Hall and the Easington Estate);
- The existing farm access in the southern boundary of the site is to be retained;
- There is potential for archaeological remains in certain parts of the site.

A.2.7 Key Constraints are shown on drawing number JJG043/017(Key Site Constraints).

Development Objectives

A.2.8 Based on the series of key constraints identified the concept at the heart of the Indicative Layout focuses development around a network of streets and open spaces that work with the landscape character of the site, retaining key areas of hedgerow and woodland, and ensuring integration with the wider setting of Banbury. The following design objectives provide the basis from which the indicative layout (refer to Parameter Plan - drawing number JJG043/27/B) has been prepared;

- develop a cohesive extension to Banbury that is an integrated part of the town;
- retain existing ecological features where possible and providing opportunities for biodiversity enhancement including hedgerow planting, ;
- retain areas of potential archeological sensitivity where possible and establish a high quality built environment in harmony respectful of historic features adjacent to the site;
- create neighbourhoods that meet a range of housing needs and support a sustainable mix of associated employment, retail, leisure and community uses;
- maintain a linked structure of useable and accessible public open spaces that are part of a comprehensive public realm framework;provide a range of premises that will support different employment opportunities;
- ensure development is fully accessible prioritising public transport, cyclists and pedestrians through provision of a comprehensive movement network of streets; and
- achieve the highest appropriate standards of sustainable environmental performance.

Urban Design Principles

Development Density

A.2.9 The site will be built at a range of densities and will be graded across the site from lower density towards the far south of the site to higher density in the northern part, particularly adjoining the areas of employment and the local centre. The average density will be 35 dwellings per hectare.

Ease of Movement

A.2.10 Each street will contribute to an integrated and permeable network which will spread benefits across the development and ensure a choice of routes to promote efficient and direct journeys. The principal street access will be from Bloxham Road (A461).

Diversity and Mixed Use

A.2.11 A mix of uses will be provided within the development to meet the needs of the local residents including a local centre, employment uses and primary school and community sports facilities. The residential development will include affordable dwellings.

Layout and Accessibility

A.2.12 The development will be accessible to all new residents and employees and will connect well with the adjoining residential areas and Banbury Town Centre. Traffic management will be integral to the design with streets designed to encourage lower vehicle speeds. Public transport accessibility will be encouraged with a high quality bus route between the site and Banbury Town Centre. A comprehensive network of footpaths and cycleways will connect with both new and existing routes linking the site to the wider strategic networks. The plan also retains existing access to the complex of farm buildings south of the site.

Design Appearance

A.2.13 The arrangement and distribution of varying densities and heights will create a series of character areas with distinct characteristics.

A.2.14 The detailed issues of width, length and depth of buildings and plots will be defined more fully in the detailed master plans and Design Codes for each character area.

A.2.15 The design of the buildings at the site will draw from architectural components that characterise the best and contemporary buildings of the area. It will be important at the detailed design stage for development to ensure that the design and layout makes a strong contribution to the identity of the area. Colours of external buildings will be of a limited range that reflects the predominant use of colour in the buildings of the surrounding area.

Approach to Access

A.2.16 The access strategy for the development is to provide a considerable level of public transport provision and improve accessibility pedestrians and cyclists with equal access for all modes (public transport, private car, cyclist and pedestrians).

A.2.17 The development will provide better connections to adjacent existing communities.

A.2.18 A proposed roundabout access off Bloxham Road (A361), will accommodate all future traffic generated by the developing the site. A number of off-site improvements will also be made to Wykham Lane, White Post Road and Bloxham Road.

Approach to Landscape and Open Space

A.2.19 The landscape strategy respects the existing character of dense hedgerows, undulating topography and mature trees, where appropriate. New development will be designed to incorporate and enhance the existing drainage and planting as much as possible.

A.2.20 Landscape mitigation and enhancement measures will benefit both landscape and ecology. These include the following:

- Sympathetic integration of formal and informal recreational areas;
- Significant retention of existing mature trees and hedgerows;
- New woodland and structural planting that links to and strengthens the existing landscaping;
- A programme of advance planting;
- Surface water attenuation areas;
- Linkages to significant retained hedgerows and green corridors to retain connectively of habitats and facilitate movement of wildlife ; and
- An option of a long-term management regime to enhance the landscape character.

A.2.21 Significant landscape features, such as the Salt Way; tree and hedgerow species will be maintained and enhanced where possible to form focal points along key views within the site. New strategic planting will reinforce the framework of existing

vegetation. Species will be selected to optimise habitat creation and ecological diversity.

A.2.22 Significant hedgerows and mature trees will be retained, where possible, within the development. Generally, retained hedgerows will not form garden boundaries and be managed to enhance their wildlife value.

A.2.23 Existing public rights of way will be incorporated into the development. These will be supplemented by additional footpath and cycleway links.

A.2.24 Within the development, smaller formal landscape spaces will be an integral element of the design, with the provision of local areas for play as well as street planting as part of a high quality landscaped public realm.

A.2.25 Provision of both formal and informal open space within the site is a key element of the proposed development.

Drainage Strategy

A.2.26 Due to the introduction of impermeable surfaces by the proposed development, appropriate drainage arrangements are required to manage surface generated by the site. A range of sustainable urban drainage solutions will be incorporated into both the built and green environments. Surface water attenuation methods such as balancing ponds, and open swales (shallow ditches) will be used to store and release collected surface water to receiving watercourses.

Sustainability

A.2.27 Building in sustainability will be an integral part of the development proposals. Possible techniques to be used include:

- Adoption of SuDS, where appropriate;
- Residential building to meet at least the requirements of Code Level 3 of the Code for Sustainable Homes;
- Implementation of strategies to reduce waste, including construction and to encourage recyclying; and
- Adoption of a 'Green Travel Plan' to encourage sustainable modes of travel.

Planning History

A.2.28 There have been no previous planning applications submitted by Gallagher Estate's Ltd for this site.

Need for the Proposed Development

A.2.29 Cherwell District Council's 2011 Annual Monitoring Report (AMR) reported a housing land supply of 2.9 years for the period 2012-2017 which equates to a shortfall of 1,560 homes. The most up to date figure for Cherwell District's housing supply is 3.2 years for 2012-17, as set out in the Statement of Common Ground for an appeal on land adjacent to the application site, South of Salt Way at Crouch Farm, Bloxham Road (Banbury appeal reference; APP/C3105/A/12/2178521).

A.2.30 The proposal represents a deliverable and a sustainable form of development in the context of the National Planning Policy Framework, there are no adverse benefits that significantly and demonstrably outweigh the benefits nor are there any specific policies that preclude the development in this location.

Consideration of the Alternatives

A.2.31 The 2011 EIA Regulations advise that Environmental Statements should provide '*an outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental effects*'.

Site alternatives

A.2.32 The adopted Oxfordshire Structure Plan 2016 identifies Banbury as a main location to which residential development is to be directed.

A.2.33 It is understood that CDC is seeking to accommodate approximately 1472 new dwellings in the Banbury Area. Approximately 1,200 are proposed to be accommodated within Banbury Canalside however the strategic allocation at Banbury Canalside is dependent on the delivery of the first phase of an Environment Agency scheme to alleviate flooding in the area. Whereas Wykham Park Farm is located in Flood Zone 1- low flood risk, and it's delivery is not dependent on any external schemes.

A.2.34 In comparison with other sites, the LDF Evidence Base demonstrates that Wykham Park Farm has a lower landscape sensitivity compared to another site west of Bretch Hill.

A.2.35 Overall in terms of other options for major development at Banbury it is considered that the scale of housing growth to be allocated would not support the full range of facilities and public transport opportunities required to create a sustainable development.

Do-Nothing alternative

A.2.36 If the site is not developed , it is likely to remain in agricultural use.

Scheme Alternatives

A.2.37 The scheme originally considered no local centre or employment. The final indicative masterplan provides a local centre, employment uses, links to public transport and informal and formal public open space and formal serving the residential element of the scheme to create a sustainable urban extension. The local retail and community uses are co-located to encourage a reduction in vehicle use as well as to foster a sense of community as a centre and a focus for the development.

Alternative Site Layouts

A.2.38 The mix of uses and the quantum of development have been informed by environmental and market considerations. Initially the idea for an indicative masterplan focussed on provision of a local centre towards the centre of the site but the final location is off the new junction of Bloxham Road (A361). This is the preferable location as it reduces the need for extraneous traffic to enter the site which would give rise to higher noise and air quality emissions on the proposed local residents.

A.2.39 The location and design of the new roundabout junction has been carefully selected to minimise vegetation removal, including mature trees. This has allowed a potential bat roost to also be retained and disruption to foraging corridors minimised as far as possible.

A.2.40 The location of the majority of the public open space collectively allows the option of maintaining the potential archaeological features that may be present, as indicated during the geophysical survey of the site, and the existing large water mains which cross the site to remain in-situ. This layout also maintains views across the open fields for properties within the residential estate of Easington located to the north west of the site.

A.2.41 The development is laid out around a central spine route, with a network of secondary and tertiary routes providing a permeable movement pattern for the development. The route has been located to ensure all residents are within 400m of public transport.

A.2.42 The development has been designed to incorporate and enhance the existing drainage and planting as much as possible and existing public rights of way and bridleways will be incorporated into the development with a 10m buffer from built development along the Salt Way.

Cumulative Effects Considered

A.2.43 Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 lists the information to include in environmental statements. The assessment should consider the cumulative effects of a number of schemes within the immediate context of the development site and how these, combined with the proposed development, will impact on the environment. The schemes considered relevant are:

- Land South of Salt Way at Crouch Farm, Bloxham Road;
- Longford Park.

A.2.44 Each technical section of this ES considers the identified schemes where the effects, combined with those of the proposed development are relevant to its discipline. The other developments considered are described below.

Land South of the Salt Way at Crouch Farm, Bloxham Road

A.2.45 This site is located immediately to the northwest of the Wykham Park Farm site (as shown on drawing number A1.3). This site is covers approximately 5.93 ha and is fairly flat and currently in arable use.

A.2.46 The western boundary is formed by the A361 and the northern boundary by the historic lane known as the Salt Way. The site is bounded by mature hedging and trees on each side. The Wykham Park Farm development site borders the site to the south and east.

A.2.47 A planning application was submitted by Mark Hogan and Barwood Strategic Land II LLP for a development comprising up to 145 dwellings with associated access. This application is currently going through the planning appeal process.

Longford Park

A.2.48 The Longford Park development is a 74.7 ha site located to the south east of Banbury on the Oxford Road (A4260). It is located approximately 650m to the north east of the Wykham Park Farm site. The site has the Oxford Canal along part of the eastern boundary. Outline planning permission was granted for 1070 residential units and with associated facilities (including primary school, playing fields, local shops and community facilities, 2,200m^2 of employment provisions (Use Class B1 Business) in September 2009.

Summary of Residual Cumulative Impacts

A.2.49 The combined developments have the potential for a significant cumulative effect on the local water supply infrastructure and regional water resources.

A.2.50 However it is anticipated that Thames Water have strategically planned for future growth of Banbury and as such will have improved the local water supply and storage infrastructure in addition to using alternative water sources, such as catchment transfer, to ensure that the future supply/demand balance for potable water is sustainably met. Based on this assumption it can be concluded that the combined developments will have a negligible cumulative significant effect.

A.2.51 The modifications proposed at the Bloxham Road / Queensway and Bloxham Road / South Bar Street / Oxford Road junctions will ensure that the junctions are able to cater for the traffic generated by the Project and the expected level of background traffic in 2022 and will bring about a long term moderate beneficial impact.

A.2.52 The modifications brought about by the Project and the committed development will have a long term moderate beneficial impact on the Oxford Road network.

A.2.53 Crouch Cottages is predicted to experience a 'slight beneficial' impact in terms of air quality due to the realignment of Bloxham Road with the development in place.

A.2.54 The changes in road traffic noise due to the development generated traffic have been assessed at a number of both existing and proposed sensitive receptors. The assessment confirms that in accordance with the significance criteria included in the Noise chapter, the increase in road traffic noise in 2017 and 2022 at the existing sensitive receptors modelledwill be below the threshold of perception and is therefore considered to be negligible. Furthermore, results at Crouch Cottages indicate that there is a perceivable drop in noise level due to the realignment of the A361 and the inclusion of the proposed junction.

Project Programme

A.2.55 It is anticipated that subject to planning permission, that construction would commence in between 2014 and 2016, with first opening of the development in 2017 and that the development would be completed by 2022.

A.3 THE SITE AND ITS ENVIRONMENT

Introduction

A.3.1 The planning application boundary for the Wykham Park Farm site covers an area of approximately 50 ha of arable farmland. The site consists of 6 relatively large and regularly shaped arable fields, defined by straight hedges and a woodland strip. For the purposes of this assessment, they are numbered site fields 1-6 from the west; 2 being north of 3 (refer to drawing A1.2).

A.3.2 The Wykham Park Farm is located in a wider largely agricultural area adjacent to the southern edge of Banbury, between the A361 to the west and A4260 Banbury to Oxford road to the east.

A.3.3 The site is bordered to the west by the heavily tree lined rural road, Bloxham Road (A361) with Crouch Cottages and Wykham Park Lodge. A small, dense, triangular copse is present north of the north western corner of the site. Agricultural land and associated hedgerows and an historic hedged track/green lane known as Salt Way forms the northern boundary of the site. The site boundary along the eastern edge comprises a low field hedge. The southern site boundary comprises a narrow strip of young plantation.

A.3.4 The western and majority of the site area is occupied by a plateau at approximately 130m AOD, falling gently southeastwards from a high point of 133m AOD on the north western corner and steepening towards a low point of approximately 125m AOD on the southeastern corner. The plateau gradients vary broadly between 1:45 and 1:50, whereas those on the land to the south steepen to 1:8.

A.3.5 Internally, field boundaries are generally straight and hedged, with occasional trees. A relatively immature north-south woodland strip separates site fields 5 and 6.

Ecology

A.3.6 No areas subject to statutory protection at a national or international level are located within the proximity of the site. One Local Wildlife Site (LWS), a non-statutory site, is located within 2km of the site. Bretch LWS is situated approximately 1.2km to the north-west of the site.

A.3.7 The majority of the application area comprises arable farmland. The most notable ecological features are the network of species rich hedgerows and their associated ditches and mature/semi-mature trees. Breeding birds, roosting and foraging bats and reptiles use part of the application area, in addition to other fauna such as small mammals.

Archaeology

A.3.8 There is evidence of Neolithic, Bronze Age, Roman and Medieval activity in the surrounding area.

A.3.9 Three Grade II Listed Buildings may experience setting impacts. These comprise Wykham Farmhouse and building ranges at Wykham Park.

A.3.10 There is potential for buried remains to present within the site, in-particular prehistoric remains dating to the Iron Age and Neolithic periods.

Water Resources

A.3.11 The nearest named watercourse is the Sor Brook which is located approximately 1.5km to the south of the site at its nearest point.

A.3.12 There are no other main rivers within the vicinity of the site. A field drainage ditch is located along the southern boundary of the site running in an easterly direction. Site inspections located this ditch which was found to be heavily overgrown and dry.

A.3.13 The OS maps show an open watercourse continuing in an easterly direction from the location of the headwall for approximately 160m before connecting to a small pond.

A.3.14 To the south of Wykham Lane, the drainage ditch is shown as a watercourse on the available OS maps. The watercourse continues in southerly direction to a small reservoir. The outfall from the reservoir continues in a southerly direction and forms a tributary to the Sor Brook.

A.3.15 The site walkover inspections identified a further two small ditches along the hedgerows within the site which are assumed to be field drainage ditches.

A.3.16 The flood map for the site shows that the development is located in an area defined as having a low risk of flooding from rivers (i.e. Flood Zone 1). As such the primary flood risk associated with this development is from surface water run-off.

Existing Movement

A.3.17 At present there is no formal vehicular access through the site or from the site to surrounding properties. Access is gained via field gates off the A361 used by farm vehicles.

A.3.18 The site adjoins the existing transportation network of Banbury. The Bloxham Road (A361) provides one of the main strategic routes into the town.

A.3.19 The Salt Way forms a traffic free section of the cycle track network. It is accessed at the junction of Bloxham Road to the west and provides access to White Post Lane to the east which leads to Bodicote High Street.

A.3.20 The site also supports three footpaths linking to Salt Way from the south. The most westerly one follows the majority of the western boundary, the central one crosses site field 5 and the most easterly one follows the narrow woodland strip between fields 5 and 6. These footpaths continue beyond the site boundary linking the Salt Way with Wykham Lane, located south of the site.

A.3.21 The key bus service in the vicinity of the site is the B1/B4 and 488/489 service which provides a 30 minute frequency service to the east of the site into Banbury. There are numerous other services which pass along the A361.

Existing Public Utilities

A.3.22 In terms of existing drainage, Thames Water's public sewer record plans show two public surface water sewers within the site boundary.

A.3.23 There are also two trunk water mains which run through the site. There are several other mains of various diameters which surround the site.

A.3.24 There are overground and underground electricity cables but no existing gas pipelines within the site boundary.

Surrounding Area

A.3.25 The site's immediate context is built development to the north, being the southern extent of Banbury. Easington School and residential development lie immediately north of Salt Way, the well defined and strong hedgerow lined track, forming the majority of the site's northern boundary. Built development in the form of Bodicote lies to the east, separated from the site by relatively level agricultural land, a cricket/sports ground and recreation area. Part of Bodicote is designated as a Conservation Area.

A.3.26 The A361 Banbury to Chipping Norton road forms the western boundary of the site with a triangle of land, occupied mainly by the Tudor Hall School playing fields, separating the site and the road further south. Agricultural land lies south of the site, extending to and beyond Wykham Lane, which runs east west approximately 500m south of the site and is a narrow local road, displaying rural characteristics. Several properties including WPF and Wykham Farm lie off it to the north and Tudor Hall School building complex to the south. The Parkland around the Tudor Hall Buildings is recognised as being of District Importance. Other land uses in the immediate site area include allotments and a cemetery, both south east of the site and lying north and south of Wykham Lane respectively.

A.3.27 The M40 lies approximately 2km east of the site's eastern boundary, with Junction 11 approximately 3.5km to the north east. They are separated by Banbury's residential southern extent and the village of Bodicote. The hamlet of Broughton lies 2km to the west and the villages of Bloxham and Adderbury some 2.5km to the south. The Sor Brook, a tributary of the River Cherwell, meanders broadly west east in a steep sided valley approximately 1km south of the site.

A.3.28 The closest residential property to the site lie to its north, in the form of suburban detached houses off Beaconsfield Road and Sycamore Drive, and south of the site in the form of individual country residences accessed off Wykham Lane. These sit at a lower elevation to the site.

A.4 PLANNING POLICY

A.4.1 This section details the planning context and background of the project (relevant Local Plans and Strategies and policies).

A.4.2 The proposed employment development at Wykham Farm Park has taken into account the following planning policy context, which comprises:

- The National Planning Policy Framework (NPPF) published 2012;
- The Regional Spatial Strategy (RSS) for the South East of England, the South East Plan, (SEP) adopted May 2009;
- Cherwell District Local Plan (1996);
- The Non-Statutory Cherwell District Local Plan (2004); and
- Cherwell Local Plan – Emerging Local Plan Policy.

National Planning Policy

National Planning Policy Framework

A.4.3 The NPPF was published in March 2012; at its cores it the presumption in favour of sustainable development for plan-making and for decision-taking. Policies in paragraphs 18 – 219, taken as a whole, constitute the Government's view of sustainable development. The '*presumption in favour of sustainable development*' is described as the '*golden thread'* running through decision taking.

A.4.4 Where the development plan is up to date then the presumption in favour of sustainable development requires approving developments where they accord with the development plan. Applications that conflict with an up to date development plan should be refused unless other material considerations indicate otherwise. Where the development plan is, absent, silent or out of date then permission should also be granted unless:

> "*any adverse impacts of doing so would significantly and demonstrably outweigh the benefits when assessed against the policies in this Framework when taken as a whole"*
>
> *"specific policies in this Framework indicate that development should be restricted*".

A.4.5 Paragraph 9 refers to the positive outcomes of pursuing more sustainable forms of development in terms of improvements to the quality of the built, natural and

historic environment. Paragraph 17 sets out the 12 core-planning principles that should underpin both plan-making and decision-taking.

A.4.6 It is a core planning principle to "proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs" (para 17).

A.4.7 The NPPF requires planning authorities to 'boost significantly' the supply of housing and stresses the importance of delivering a wide choice of high quality homes which meets local needs, delivered through high quality and inclusive design. Paragraph 47 refers to a list of measures to help local planning authorities achieve this aim. One of the key requirements of the NPPF is for local authorities to identify a five year supply of deliverable housing sites, against their housing requirements with an additional buffer of 5%, (to ensure choice and competition in the market for land). Where there has been a record of persistent under delivery of housing, local planning authorities are required to increase the buffer to 20% in order to provide a realistic prospect of achieving the planned supply.

A.4.8 The NPPF places a priority on sites which are considered "deliverable", defined in footnote 11 as sites that are "available now, offer a suitable location for development now, and be achievable with realistic prospect that housing will be delivered on the site within five years and in particular that development on the site is viable".

A.4.9 Paragraph 49 states that 'housing applications should be considered in the context of the presumption in favour of sustainable development. Relevant policies for the supply of housing should not be considered up-to-date if the local planning authority cannot demonstrate a five-year land supply'.

A.4.10 The clear requirement placed on Local Authorities to front load delivery of housing demonstrates the importance the Government places on 'boosting' housing supply.

A.4.11 The NPPF seeks to ensure the vitality of town centres by promoting competitive town centres, retaining and enhancing existing markets and where appropriate reintroducing or creating new ones. This is reinforced through the use of a

sequential approach, where town centre uses, referred to in paragraph 26 as retail, leisure and office development, are prioritised to town centre locations, then edge of centre locations and only if suitable sites are not available should out of centre sites be considered. When considering edge of centre and out of centre proposals, preference should be given to accessible sites that are well connected to the town centre.

A.4.12 Paragraph 27 is clear that where applications fail to satisfy this sequential test or are likely to have a significant adverse impact on one or more of the above factors, they should be refused. Applications for retail, leisure and office development outside of town centres, that are not in accordance with an up-to-date Local Plan, require submission of an impact assessment demonstrating compliance with the sequential approach. This requirement is removed for developments under a certain floor area threshold, which can be locally set. In the absence of a locally set threshold, the NPPF sets a default of 2,500 sq m. (para 26).

Regional Planning Policy

A.4.13 The Government intends to abolish Regional Spatial Strategies through the Localism Bill, which gives rise to uncertainty over regional policies and targets.

A.4.14 Notwithstanding this, at present the RSS is capable of being a material consideration and therefore it is appropriate to set out the relevant regional plan policies.

A.4.15 The Regional Spatial Strategy (RSS) for the South East of England, the South East Plan, (SEP) was adopted in May 2009, provides a broad development strategy for the region until 2026 and makes provision for significant housing delivery.

A.4.16 Policy H1 of the Regional Plan sets the housing target of 13,400 dwellings (670 per annum) for Cherwell District Council over the plan period (2006-2026). The South East Plan divides the district into two areas defined as “Central Oxfordshire” (6,400 homes) and “Rest of Oxfordshire” (7,000 homes).

A.4.17 Policy SP3 refers to the Plan’s intended urban focus, based around principles of urban renaissance and sustainable development.

Local Planning Policy

Cherwell District Local Plan (1996)

A.4.18 The adopted Cherwell Local Plan (adopted November 1996) still remains part of the statutory Development Plan for the area. A number of policies are still relevant and 'saved' until the Council's Local Development Framework that will replace the adopted Cherwell Local Plan is in place.

A.4.19 The relevant 'saved' policies that relate to the Banbury area are: Policy H5 – Affordable Housing; Policy TR14 – Formation of new accesses to the inner reliefroad and Hennef Way, Banbury; Policy TR16 – Access Improvements in the vicinity of Banbury Railway Station; Policy R14 – Reservation of land for community buildings in association with housing developments at Hanwell Fields, Banbury;

- Policy C5 – Protection of ecological value and rural character of specified features of value in the district;
- Policy C15 – Prevention of coalescence of settlements; and
- Policy C34 – Protection of views of St Mary's Church, Banbury.

A.4.20 There are no policies that relate specifically to the site.

The Non-Statutory Cherwell District Local Plan (2004)

A.4.21 The Non-Statutory Cherwell District Local Plan 2011 was intended to review and update the Local Plan adopted in 1996. Due to changes to the planning system introduced by the Government, work on the plan was discontinued prior to adoption. The Non-Statutory Cherwell Local Plan is not part of the statutory development plan but it has been approved as interim planning policy for development control purposes.

A.4.22 Policy S2 refers to the sequential approach adopted as part of PPG6 and carried forward in the NPPF. Paragraph 5.5 however, limits the requirement of demonstrating compliance with the sequential approach to retail proposals only, applying a 2,500 sq m floor area threshold. The threshold is consistent with the NPPF, however the higher policy tier applies this to a broader range of uses to include retail, leisure and office proposals.

A.4.23 There are no policies that relate specifically to the site.

Emerging Planning Policy

A.4.24 The Cherwell Local Plan is currently at consultation stage, prior to its submission to the Secretary of State of Communities and Local Government for public examination. Whilst the plan does not form part of the statutory development plan, it is a material consideration and provides an indication of the growth strategy for the district over a 20 year period.

A.4.25 The Plan provides for an additional period of 5 years above the RSS provision, to cover a plan period 2006 to 2031. The annual RSS housing target of 670 has been rolled forward, to provide for 16, 750 over the plan period.The Council has not yet formally determined its position on whether the 5% or 20% buffer is applicable.

A.4.26 The spatial strategy to manage growth within the district focuses the bulk of growth in and around Bicester and Banbury.

A.4.27 Paragraph A.11 reads 'most of the growth in the district will be directed to locations within or immediately adjoining the main towns of Banbury and Bicester' It is therefore clear that Banbury will make a substantial contribution in meeting the housing needs of the district. Policy BSC 1 sets out the district wide housing provision, Banbury to provide 4,352 homes over the plan period. Policy BSC 2 aims for 40% of new homes to be delivered on brownfield land and new housing on brown and greenfield land to be provided at a density of no less that 30 dph. Central to this growth agenda is the creation of sustainable communities that meet the needs of a growing and ageing population, offering a high quality of life. Policy BSC 3 requires 30% affordable homes, 70% of which will be social rented/ affordable rented dwellings and 30% as other forms of intermediate affordable homes.

A.4.28 Policy BSC 4, sets out the required housing mix to meet local housing need, to include the provision of 'extra care' dwellings.

A.4.29 Policy ESD 3, requires all new residential development to meet Code Level 4 of the Code for Sustainable homes and non-residential development to meet BREEAM 'very good'.

A.4.30 Policy ESD 15, refers to new green boundaries to growth, their purpose is that they are kept free from built development to maintain distinctive identity and prevent

coalescence. With regard to edge development at Banbury, the green buffers serve to protect the villages of Hanwell, Drayton, Bodicote and Adderbury. The plan does however refer specifically to the additional buffers on the south east edge of Banbury, the rationale being for the protection of Crouch Hill and historic Salt Way.

A.4.31 Para B.258 states that development at the edge Banbury will need to address how they face out into the open countryside and present a green edge to development. Proposals will also be considered against the requirements of 'Policy ESD 13: Local Landscape Protection and Enhancement'.

A.4.32 Para C.126 sets out the strategy for ensuring sustainable development in Banbury, which includes:

- Provide for new development that will bring with it new open space and recreation opportunities;
- Plan new development in a way that will improve access to natural and semi-natural green space and promote opportunities for new publicly accessible wooded areas;
- Provide for new development in accessible locations which will provide good opportunities for improving and accessing public transport services, for delivering and using new cycleways, for travelling on foot and for minimising the impact on the highway network and traffic congestion.

A.4.33 Para 127 recognises that mixed use strategic development sites delivering housing, services and facilities and contributions to local infrastructure are considered to be the most sustainable way of meeting Banbury's housing needs and addressing the issues facing the town.

Housing Land Supply

A.4.34 The 2011 Annual Monitoring Report (AMR), reported a housing land supply of 2.9 years, however an update to this position was prepared in April 2012 to inform a Public Inquiry, revising the figure upwards to 3.1 years for the five year period 2012-17.

A.4.35 Cherwell District Council published a housing land supply briefing note in 14 August 2012, which confirms this position.

A.4.36 The 2011 AMR breaks down the housing land supply into the two sub regions referred to in SEP as "Central Oxfordshire" and "Rest of Oxfordshire", but referred to within Cherwell Local Plan as "Bicester and Central Oxfordshire" and "Banbury and North Cherwell" respectively. The former has a 4.1 housing land supply, compared with a far smaller 1.7 years within the Banbury/ North Cherwell sub-region.

A.4.37 The 2011 AMR reported housing completions (net) in 10/11 were 370 compared to the South East Plan requirement of 670 per annum. Furthermore, overall housing completions in 11/12 are expected to be low with a projection of 222 excluding previously unidentified sites.

The Site

A.4.38 Wykham Park Farm is not allocated for development within the emerging Local Plan, however the site was identified in the 'Options for Growth' document (September 2008), (BAN 4) as an option for an area of planned growth of approximately 1600 dwellings. The site was considered as the following:

> "*Relatively close to the town centre, secondary schools, hospital and a superstore. Sufficient land to create a coherent neighbourhood and new local centre without unacceptable harm to landscape further south (Sor Brook Valley). Several access options: Broughton Road, south of Easington, Wykham Lane or Bodicote roundabout. Potential for coalescence (coming together) with Bodicote and for impact on landscape along Wykham Lane. This restricts the potential for southward, eastward and westward expansion*".

A.4.39 The Sustainability Appraisal (SA) sets out the reasons as to why the site was not brought forward into the draft Core Strategy, (Appendix C, Table C.1 Assessment of Alternatives, pp317).

A.4.40 The SA confirms that the site was identified as an option in the Council's Options for Growth document, however only part of the site was considered to be a reasonable alternative.

A.4.41 The Council's SA suggested that coalescence issues prevented east and southwards expansion, and went on to suggest that the site scored low in terms of accessibility

to the town centre and employment areas on eastern side of the town. Furthermore, the proximity to the Salt Way, considered an important wildlife and recreational corridor, was considered likely to be adversely affected by development.

A.4.42 The SA also referred to the Landscape Sensitivity and Capacity Report (LSCR) (2010) which concluded that the site had low to moderate capacity to accept residential development.

Principle of Development

A.4.43 The District does not have a 5 year land supply and therefore by virtue of paragraph 49 of the NPPF the relevant policies for the supply of housing cannot be considered up-to-date.

A.4.44 The 2011 Annual Monitoring Review reported an under delivery of (net) housing completions for 10/11, and overall housing completions in 11/12 are expected to be low.

A.4.45 The key considerations relevant to the principle and layout of development in this location are those as cited in the SA, which detail the exclusion of the site from the draft Local Plan.

- Coalescence with Bodicote (Policy ESD 15, Green Buffers);
- Proximity to the Salt Way;
- Accessibility to town centre and eastern employment areas;
- LSCR concluded low to moderate capacity for development.

Coalescence

A.4.46 The nearest village is Bodicote that sits to the east of the site at a distance of more than 0.5 km from the site boundary, separated by Wykham Lane that runs east-west connecting A361and A4260. Furthermore there is a good degree of existing woodland edge on the south and the east site boundaries which reates a structural landscape buffer to screen development from views from Bodicote, including the sensitive areas within Bodicote Conservation Area as referred to in the LSCR.

Proximity to the Salt Way

A.4.47 The SA refers to the importance of the Salt Way as a wildlife and movement corridor, concluding that any proximal development would be detrimental. The mitigation methods within the LSCR however, refer to the opportunity to reinforce the Salt Way as a green corridor, linking the Sor Brook valley to the surrounding network of footpaths around Wykham Farm Park.

A.4.48 The emerging Local Plan admits the District is deficient in quality public open spaces and green infrastructure, and development here presents an opportunity to protect and enhance a key resource.

Accessibility to town centre and eastern employment areas

A.4.49 This view was informed through a baseline assessment; the development proposes a mixed use local centre and benefits from highway, footpath and cycleway connections.

B ASSESSMENT OF ENVIRONMENTAL EFFECTS

B.1.1 LAND USE, AGRICULTURE AND SOILS

Introduction

B.1.2 This chapter of the ES has been prepared by WA. A description of the development is provided in Section A.

B.1.3 This chapter assesses the baseline characteristics of the soil resources, agricultural productivity and land use at the proposed site using published information sources and data collected during a baseline soil survey. Aspects of agricultural and soil characteristics are considered including climate, topography, drainage, depth of soil resources and soil qualities such as texture. The potential impacts of the proposed development upon soil resources, agriculture and land use have been described. Quantitative and qualitative significance criteria are detailed, against which the potential impacts of the proposed scheme have been measured and where appropriate details of mitigation measures required to address those impacts identified. Residual impacts are then identified under such circumstances where potential impacts cannot be fully mitigated.

Definitions

B.1.4 The term 'best and most versatile' agricultural land is used to mean agricultural land of Grades 1, 2 and 3a as defined using the 'Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land' (MAFF, 1988) and National Planning Policy Framework (Department for Communities and Local Government, 2012). Best and most versatile agricultural land has been identified in the baseline survey together with land classified as subgrade 3b, 4 and 5, which are of lesser significance with respect to the published guidance.

Summary of proposals

B.1.5 In terms of potential impact of the proposed scheme upon soil resources and land use, the main areas of interest relate to:

- permanent loss of agricultural land primarily to built development;
- loss of soil structure as a consequence of soil handling and storage of soils during the development;
- potential disruption to agricultural drainage within the site and on adjacent

land as a consequence of the development; and

- soil rehabilitation, restoration and aftercare management.

Assessment Methodology

B.1.6 A soil survey was carried out over the proposed development areas and additional land to the south during September 2012 using a 70mm hand-held Edelman auger capable of sampling to 120cm depth. Soil auger locations are detailed on Drawing B1.1.

B.1.7 The findings of the survey and other research considers relevant soil parameters such as stone content, depth to an impermeable layer, subsoil mottling, slope gradient and agroclimatic information to determine the Agricultural Land Classification (ALC). The data obtained from the soil survey was used to calculate the moisture balance of the soil to determine the soil's capability to support growing crops, which can also limit the ALC grade. The calculations and methodology are set out in "Agricultural Land Classification of England and Wales; Revised guidelines and criteria for grading the quality of agricultural land" (Ministry of Agriculture, Fisheries and Food, 1988).

B.1.8 Information regarding the site was obtained from the following sources:

- 'Soils and their Use in South East England' (Soil Survey of England & Wales, 1984) and accompanying 1:250,000 Sheet 6 South East England;
- 'Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land' (MAFF, 1988);
- 'Climatological Data for Agricultural Land Classification: Gridpoint datasets of climatic variables at 5km intervals for England and Wales' (Met. Office, 1989); and
- 1:250,000 Provisional Agricultural Land Classification Sheet, South East Region (MAFF 1993).

Methods of assessment and quantification of impacts

B.1.9 The detailed information collected from the soil survey has been used to determine the classification of agricultural land capability in accordance with the 'Agricultural

Land Classification of England and Wales, revised guidelines and criteria for grading the quality of agricultural land' (MAFF, 1988). This is used in conjunction with the interpolated agro-climatic characteristics of the site, as determined from 'Climatological Data for Agricultural Land Classification: Gridpoint datasets of climatic variables at 5km intervals for England and Wales' (Met. Office, 1989).

B.1.10 In order to produce a robust assessment, appropriate criteria have been selected to quantify the significance of impacts associated with the proposal. Unlike other environmental issues such as noise and dust, the environmental impact of development upon land use and soil resources has very little, if any, recognisable national, regional or local criteria or guidelines published (e.g. DEFRA, Environment Agency, professional institutes). As such, the criteria have been selected on the basis of the understanding and knowledge of experience, with reference made where possible to published guidelines and criteria.

B.1.11 The criteria have been selected for three main groups of potential impacts:

- impacts upon land quality (ALC);
- impacts upon soil resources; and
- impacts upon agricultural drainage.

B.1.12 Assessment criteria have not been selected to determine the significance of impact upon land use and farm business. Potential impacts are considered to be fully mitigated through the process of discussion and negotiation between the developer, the land owners, and any agricultural tenants who lease the land. It is considered that such negotiations have therefore already reached a satisfactory stage whereby landowners are effectively compensated for all potential loss of revenue from farm business (e.g. through options, direct compensation, etc).

Agricultural land quality

B.1.13 Table B1.1 summarises the relevant assessment criteria for disturbance to or loss of agricultural land according to quality.

Table B1.1 - Summary of assessment criteria – land and ALC

Significance	Disturbance or loss of high ALC grade land
Adverse high	>20ha of ALC Grade 1, 2 or 3a land permanently lost. >50ha of ALC Grade 3b or below permanently lost. >50ha of ALC Grade 1, 2 or 3a land temporarily lost. >100ha of ALC Grade 3b or below temporarily lost.
Adverse moderate	10-20ha of ALC Grade 1, 2 or 3a land permanently lost. 20-50ha of ALC Grade 3b or below permanently lost. 20-50ha of ALC Grade 1, 2 or 3a land temporarily lost. 50-100ha of ALC Grade 3b or below temporarily lost.
Adverse low	<10ha of ALC Grade 1, 2 or 3a land permanently lost. <20ha of ALC Grade 3b or below permanently lost. <20ha of ALC Grade 1, 2 or 3a land temporarily lost. <50ha of ALC Grade 3b or below temporarily lost.
Criteria based on:	National, Regional and Local Planning Policy Consultant's experience

Soil resources

B.1.14 The assessment criteria used to determine the scale of potential impact of the proposed development upon soil resources are summarised in Table B1.2, based upon permanent or temporary losses and/or damage to soil resources arising as a result of the proposed development.

Table B1.2 - Summary of assessment criteria – soil resources

Significance	Damage to soil resources	Loss of soil resources
Very high adverse	Permanent irreversible damage to soil resource quality through handling, stockpiling etc	>50% soil resources removed from site.
Adverse high	Long term temporary/reversible damage to soil resource quality through handling, stockpiling etc.	25-50% of soil resources removed from site.
Adverse moderate	Moderate term temporary/reversible damage to soil resource quality through handling, stockpiling etc.	<25% of soil resources removed from site.
Adverse low	Short term, reversible damage or disruption to soil resource quality through handling, stockpiling etc	All soil resources retained on site.
Neutral	No damage or disruption to soil resource quality.	
Criteria based on;	Consultant's experience DEFRA/Environment Agency guidance	

Drainage

B.1.15 The assessment criteria selected to determine the scale of potential impact of the proposed development upon agricultural drainage systems (both on site and off site) are summarised in Table B1.3, based upon permanent/irreversible changes and long term/short term/temporary changes to agricultural drainage arising as a result of the proposed development.

Table B1.3 - Summary of assessment criteria – agricultural drainage

Significance	Disruption to agricultural drainage
Adverse high	Permanent (irreversible) disruption to on-site or off-site agricultural drains
Adverse moderate	Long term (reversible) disruption to on-site or off-site agricultural drains
Adverse low	Short term, reversible disruption to on-site or off-site agricultural drains
Neutral	No disruption to on-site or off-site agricultural drains
Criteria based on;	Consultant's experience

Baseline conditions

Field units

B.1.16 The total site area is approximately 50ha. Within the site the area used as agricultural land was surveyed. The survey sampled within 6 field units utilised for arable cropping (see Table B1.4 and Drawing B1.1). The town of Banbury is located immediately to the north, with agricultural land to the east, south and west.

Table B1.4 - Field units

Field ID	Landuse (at time of survey)	Area (ha)
F1	Arable – seedbed preparation	5.8
F2	Arable – seedbed preparation	7.8
F3	Arable – seedbed preparation	6.9
F4	Arable – seedbed preparation	19.4
F5	Arable – seedbed preparation	4.9
F6	Arable – wheat stubble	3.2
		Total area of agricultural land within the site = 48ha

Soil characteristics

Desk study

B.1.17 Soils within the site are mapped, according to published sources, as belonging to the following soil associations:

B.1.18 544 'Banbury' soil association. This association is mapped as being present over eastern areas of the site , and potentially encroaching into the western and southern areas of the site.

B.1.19 The geology of the Banbury association is described as Jurassic and Cretaceous ironstone. This association comprises well drained brashy fine and coarse loamy ferruginous soils over ironstone. There are also some deep fine loamy over clayey soils with slowly permeable subsoils which are affected by slight seasonal waterlogging. Typical land uses in areas of Banbury soils include winter cereals with short term grassland, potatoes, permanent grassland on valley slopes, sugar beet.

B.1.20 A typical soil profile is described in the published resource material as:

- 0 – 20cm dark brown, slightly stony clay loam or sandy clay loam;
- 20 – 50cm strong brown, slightly stony clay loam; strong medium granular or fine angular blocky structure;
- 50 – 70cm strong brown or reddish brown, very stony clay loam; strong medium granular or fine angular blocky structure; and
- 70 – 100cm strong brown or reddish brown, extremely stony clay loam; massive structure.

B.1.21 Soils in the Banbury soil association are described as well drained (Wetness Class I), and the soils readily absorb winter rainwater.

B.1.22 712b 'Denchworth' soil association. This association is mapped as being present over northern and central areas of the site.

B.1.23 The geology of the Denchworth association is described as Jurassic and Cretaceous clay. This association comprises slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils. There are also some fine loamy over

clayey soils with slight seasonal waterlogging, and some slowly permeable calcareous clayey soils. Denchworth soils are affected by landslips and associated irregular terrain locally. Typical land uses of the Denchworth association include winter cereals and short term grassland in drier lowlands and dairying on permanent grassland in moist districts.

B.1.24 A typical soil profile is described in the published resource material as:

- 0 – 25cm dark greyish brown, slightly stony clay loam or clay;
- 25 – 65cm grey with many ochreous mottles, stoneless clay; weak medium subangular blocky structure; and
- 65 – 100cm grey, mottled, stoneless clay; weak coarse prismatic structure, calcareous.

B.1.25 The major soils in the Denchworth association are described as slowly permeable and are waterlogged for prolonged periods in winter and at times in the growing season (Wetness Class IV).

Findings of the survey

B.1.26 The soil profile of the agricultural land within the survey area was examined in order to determine the characteristics of the soil resource, and to determine the Agricultural Land Classification (ALC) grade (see below). A summary of the observed soil profiles is included as Appendix B1.1.

Soil survey

Topsoil

B.1.27 Topsoil over the site was consistently 20cm (Fields 2 and 3), 25cm (Fields 4 to 6) or 30cm (Field 1) strong brown clay loam generally demonstrating a moderate angular blocky to granular structure. Abundant large stones (~2cm) on the surface were recorded in Fields 1, 5 and 6.

Subsoil

B.1.28 The depth of the subsoils over the site varied with the depth to stony layers. Fields 2, 3 and 4 were consistently deep (120cm), whilst the remaining fields encountered excessively stony layers between 40cm and 80cm, or none at all within 120cm.

B.1.29 Subsoil over Fields 1, 5 and the northern extents of Field 6 generally comprised a yellowish brown or strong orange brown clay loam or clay, with a coarse angular blocky structure.

B.1.30 Subsoil over Fields 2, 3 and 4 generally comprised an orange brown or strong brown clay loam or clay, with a coarse angular blocky structure; over an orange and olive brown, mottled clay with a coarse prismatic structure.

B.1.31 Subsoil over the south of Field 6 generally comprised a yellowish brown or strong orange brown sandy clay loam, with a moderate angular blocky to granular structure.

Soil profiles

B.1.32 The findings of the site survey are comparable to the literature based assessment, in that the soil profiles described generally match the description given of the typical component of the Banbury soil association. Soils within Fields 2, 3 and 4 were similar to the mapped Denchworth association; but also shared certain characteristics with the Irondown series described below:

- 0 – 25cm dark brown, slightly stony clay loam;
- 25 – 60cm yellowish brown, slightly mottled, slightly stony clay loam; moderate medium subangular blocky structure;
- 60 – 80cm olive brown, mottled, stoneless clay; weak very coarse prismatic structure; and
- 80 – 100cm olive brown, mottled, stoneless silty clay; massive structure.

Drainage

B.1.33 The site is located on level or slightly undulating land, with water draining into the soil profile and underlying geology, and south towards the Sor Brook.

Agroclimatic data

B.1.34 The agroclimatic data of a site influences the Agricultural Land Classification in respect of growing conditions for crops, and the soil reaction in terms of wetness and droughtiness. The Meteorological Office publishes agroclimatic data for England and Wales on a five kilometre grid basis, from which the following data was

interpolated for the survey area. Table B1.5 shows the values given for the nearest agroclimatic datasets and the interpolated values for the site.

Table B1.5 - Agroclimatic data for Wykham Park Farm

Grid Reference	Gridpoint dataset SP450350	Gridpoint dataset SP450400	Wykham Park Farm SP448385
Altitude (ALT)	109m	118m	130m
Average Annual Rainfall (AAR)	691mm	694mm	696mm*
Accumulated Temperature January – June (AT0)	1378 day^{o}C	1365 day^{o}C	1352 day^{o}C*
Moisture Deficit Wheat	101mm	102mm	100.3mm*
Moisture Deficit Potatoes	91mm	92mm	89.8mm*
Duration of Field Capacity	155 days	157 days	157 days*
* interpolated from gridpoint datasets			

B.1.35 The site is located in an area with an average annual rainfall of 696mm per year and duration of field capacity (FCD) of 157 days (i.e. period over winter and spring during which the soil has more water available than can be used by growing crops).

Agricultural Land Classification

B.1.36 Agricultural Land Classification (ALC) is a standardised method for classifying agricultural land according to its versatility, productivity and workability, based upon inter-related parameters including climate, relief, soil characteristics and drainage. These factors form the basis for classifying agricultural land into one of five grades (with grade 3 land divided into subgrades 3a and 3b). Best and most versatile agricultural land is classified as grades 1, 2 or subgrade 3a, whereas moderate to very poor quality land is designated subgrade 3b or grades 4 and 5, and is restricted to a narrow range of agricultural uses.

B.1.37 The ALC map for the South East indicates that the eastern, and potentially some southern and western, areas of the site have an ALC of grade 2; and northern and central areas of the site have an ALC of grade 3 (see Appendix B1.2). There is no differentiation made between sub-grades 3a and 3b at the scale of map provided (1:250,000). The mapping indicates that grade 2 and 3 soils are common in the area around Banbury, with smaller areas of grade 1 and grade 4 land present.

B.1.38 Additional post 1988 ALC mapping from previous MAFF surveys (typically at 1:10,000 scale) indicates land within the site has been assessed as a mixture of grade 2, subgrade 3a and subgrade 3b land (see Appendix B1.3). Additional land in the vincinity has been assessed as a mixture of grade 2, subgrade 3a and subgrade 3b, with smaller areas of grade 4 land present.

Climatic, site and soil limitations

B.1.39 The combination of average annual rainfall and accumulated temperature (696mm and 1352 day°C respectively, see Table B1.5) identifies there are no climatic limitations to ALC at Wykham Park Farm.

B.1.40 Gradient has a significant effect on mechanised farm operations since most conventional agricultural machinery performs best on level ground. The safe and efficient use of machinery on sloping land depends very much on the type and design of the machine and on the nature of the slope being farmed. The gradient over the site is consistently less than 7 degrees. This means that the survey area does not exhibit slopes likely to restrict agricultural machinery; therefore ALC is not limited by gradient.

B.1.41 Soil depth is important when determining available water capacity and shallow soils can affect cropping in a number of ways. Whilst augers were frequently impeded, this was generally as a result of stones in the subsoil and the soil resources is consistently deeper then 60cm over the survey area, therefore soil depth is not a limiting factor.

B.1.42 Stones act as an impediment to cultivation, harvesting and crop growth. A high stone content reduces the potential for certain agricultural crop management, can cause wear and tear to agricultural implements/tyres and can reduce the quality of crops (i.e. bruising potatoes during harvesting). A limitation to ALC by stones depends on the size, quantity, shape and hardness of the stones. Stoniness is a limitation to ALC that applies over the eastern and western fields within the site, limiting the ALC to grade 2 in Fields 5 and 6, and subgrade 3a in Field 1.

Interactive limitations

B.1.43 The physical limitations resulting from the interactions between climate, site and soil characteristics are soil wetness and droughtiness. Soil wetness limitations adversely affect plant growth or agricultural management (e.g. grazing, machine operation, poaching by livestock, smearing by machinery). Droughtiness is most likely to be a significant limitation to crop growth in areas with low rainfall and high evapotranspiration, or where the soil profile holds only small reserves of moisture. Droughtiness was a limiting factor to ALC over parts of the site, giving a maximum grade of 2 in Field 5 and the northern extent of Field 11; and subgrade 3a in Field 1.

B.1.44 A secondary factor, accompanying other more critical limitations such as slope or droughtiness, is erosion related to wind or water action. Soils at the site are at risk of a loss of topsoil, seeds, seedlings and fertiliser, as well as damage from abrasion to plants, due to wind erosion. Factors which are potentially active, such as flat or gently sloping land and bare, dry soils with sandy textures, could combine to create an erosion hazard when strong winds are blowing. The stone and clay content of the soils does, to some extent, reduce the risk of wind erosion, as does the extensive hedgerow and woodland planting around field units.

B.1.45 For ALC purposes the soil wetness assessment takes account of:

- Climatic regime (duration of field capacity = 157 days);
- Soil water regime based on soil profile characteristics (Wetness Class I or III, see above); and
- Texture of the top 25cm of the soil profile (loamy).

B.1.46 Based on the criteria laid out above, Fields 2, 3 and 4 are allocated an ALC of subgrade 3a based on a soil wetness limitation.

Baseline Summary

B.1.47 The primary limitations to Agricultural Land Classification at Wykham Park Farm are droughtiness, soil wetness and stoniness, limiting the survey area to a mixture of grade 2 (8.8 ha) and subgrade 3a (39.2 ha). All agricultural land within the survey area is of best and most versatile quality. The ALC grades within the survey area are detailed on Drawing B1.2.

B.1.48 In the area around Banbury, ALC grade 2 and 3 land is widespread and the presence of best and most versatile land in this part of the country in not unique, as detailed through previous MAFF surveys and maps (see Appendices B1.2 and B1.3). The post 1988 MAFF mapping around Wykham Park Farm is comparable to Wardell Armstrong's 2012 survey with a mixture of grade 2 and 3 land being recorded, although the areas differ slightly and no subgrade 3B land was encountered in the 2012 survey. Soils in the Banbury association are well drained and often of best and most versatile quality, with Denchworth (and Irondown) soils generally being more borderline best and most versatile to lower quality grades due to slowly permeable horizons present in soil profiles, allowing for longer periods of waterlogging and seasonal wetness.

Assessment of impacts

Agricultural land and land classification

B.1.49 The proposal would result in the permanent loss of approximately 48ha of grade 2 and subgrade 3a agricultural land. In several areas of the site, the soil profile would be left intact but would no longer be agricultural as the landuse changes to public open space. It is proposed to utilise the stripped soils for gardens, public open spaces and landscaping.

Soil resources

B.1.50 The proposed development would involve the stripping, temporary stockpiling and re-use of topsoil resources. This activity has the potential to damage soil in terms of soil structure, nutrient content and soil organism activity if not carried out in an appropriate manner. It is intended to retain soil resources within the site for use in site restoration; however, if a surplus of soils is identified then some of the resource may require removal from the site.

B.1.51 Topsoil will be stripped as a uniform layer to 0.3m depth in Field 1; 0.2m depth in Fields 2 and 3; and 0.25m depth in Fields 4, 5 and 6. Where subsoil is to be stripped, it will be stripped as a single layer of a thickness of between approximately 0.9m and 1m (i.e. soil stripped to approximately 1.2m total depth) or to the total depth of soil to bedrock. Topsoil storage bunds would not exceed 3.5m in height, and subsoil storage bunds would not exceed 5m in height. Soil stockpiles and bunds would be constructed in such a way to enable stabilisation, control runoff rates and mitigate

the visual impact of site operations. All soil stockpiles and bunds would be seeded to reduce erosion and nutrient losses, and to minimise any impact on soil fauna.

Drainage

B.1.52 The proposed development could potentially impact upon the agricultural drainage systems of adjacent fields. This may be either as a result of direct disruption of drainage from adjacent land, or additional runoff generated from development areas. This has the potential to result in standing water collecting on previously well drained land. Indirect impacts on drainage could result from the release of sediment from the proposed development to nearby drains, causing them to become blocked.

Agricultural units and land classification

B.1.53 With reference to the identified potential impacts, the criteria provided and the mitigation measures detailed, the significance of potential adverse impact upon land classification is considered adverse high. This is because the proposal would result in a permanent loss of approximately 48ha of best and most versatile quality agricultural land to built development. Additional agricultural land within the site would be lost as a result of the change in landuse, although soil profiles would remain intact.

Soil resources

B.1.54 With reference to the information provided, the criteria provided and the mitigation measures detailed, the significance of potential adverse impact upon soil resources is considered low to moderate adverse.

B.1.55 All topsoil resources would be protected from short-term handling and storage impacts by the adoption of an appropriate soil handling and stockpiling regime.

B.1.56 Wherever possible, it is intended to retain soil resources on site for restoration purposes; however if a surplus of soils is identified then limited resources may need to be removed from the site to be suitably utilised elsewhere (i.e. agricultural restoration / improvements off site). Should a need for exportation of soil be identified at the detailed design stage, this would be assessed at that time. If all soil resources are reused on site the impact would be low; whereas the removal of <25% of soil resources from the site would be assessed as a moderate impact.

Drainage

B.1.57 With reference to the information provided in, the criteria provided and the mitigation measures detailed, the significance of potential adverse impact upon agricultural drainage both on and off site is considered adverse low. The development would be conducted in such a way to prevent, minimise or control agricultural drainage impact within the site and within adjacent fields.

Mitigation

B.1.58 Appropriate mitigation measures are recommended and integrated within the proposed scheme to reduce, prevent or control potential negative impacts of the proposal upon soils and landuse. Residual impacts are also identified where measures cannot fully mitigate the identified negative impacts.

Agricultural land and land classification

B.1.59 The permanent loss of agricultural land cannot be mitigated directly. Stripped soils at the site are to be utilised in the creation of gardens, open spaces and landscaped areas.

B.1.60 No land is to be returned to agriculture. Whilst soil profiles would remain intact in several areas following development, the site would be classed as 'non-agricultural'.

Soil resources

B.1.61 Soils would be handled in accordance with the recommendations of DEFRA in the document 'Good Practice Guide for Handling Soils' (MAFF 2000). Soil resources would be protected against damage during stripping, handling, stockpiling and restoration by adoption of appropriate up to date guidance measures, which would aim to protect topsoil resources from damage. Typical working methods and techniques used to protect topsoil resources include the following:

- the handling of soil resources only when sufficiently dry, generally limiting soil operations to the months May to September (although this period may be extended during dry periods);
- the stripping, handling and storage of topsoil separately from subsoil movements;
- appropriate seeding of soil storage mounds required on site for a period

longer than 6 months, to prevent erosion and to maintain soil structure, nutrient content and biological activity. Topsoil stockpiles will have a maximum height of 3.5m. Subsoil, and other superficial materials handled during the development will only be stockpiled in areas previously stripped of topsoil;

- the handling of all soils by low ground pressure bulldozer, 360° excavator and dumptruck;
- minimising the number of machine movements across topsoil;
- adoption of a bed/strip system for soil stripping, to minimise compaction; and
- the definition of all site haul roads and storage areas.

B.1.62 Subsoil resources could be utilised if necessary as fill material for the engineering of development platform areas. There is also the potential for the use of soil resources elsewhere in the locale for improvement of land (e.g. infilling hollows, creation of landscaped areas). These measures should be incorporated into a detailed soil handling strategy, to be forwarded to the planning authority and DEFRA for approval at a later date, most likely during the detailed planning application stage.

B.1.63 If a surplus of soils were to be identified during the detailed design stage, soils would be removed from the site for suitable use elsewhere (i.e. agricultural restoration, land reclamation, etc). These soils would be handled in accordance with the methods and techniques described above, in addition to the guidance within Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (DEFRA 2009).

Drainage

B.1.64 Sustainable urban drainage systems and source controls are to be utilised within the development, to reduce potential impact upon receiving watercourses, this will mitigate potential impacts associated with runoff from the development affecting agricultural land. It is considered unlikely that the drainage of adjacent agricultural land will be impacted by the proposed development, provided that agricultural drainage from surrounding land is not cut-off or stopped up during the course of the development. The use of appropriate cut-off trenches and temporary field drains

during construction will protect existing agricultural drainage measures. The locations of soil storage mounds will not increase flood risk to the site.

Restoration of soils

B.1.65 Soils would be utilised for a mixture of gardens, open spaces and landscaping. A target restored soil profile similar to the natural profile within the site could be achieved, comprising:

- 0 – 25cm clay loam topsoil; and
- 25 – 120cm clay loam / clay subsoil.

B.1.66 The restored soil profiles within the site would be seeded with an appropriate grass seed mix.

B.1.67 An area of potentially sensitive archaeology is located within the east of the site and any surplus topsoil could be utilised to create a minimum 45cm cover to protect the features.

Aftercare

B.1.68 Appropriate aftercare measures will be carried out within newly established Public Open Spaces (including amenity grassland, parks and landscape planning blocks) to ensure satisfactory restoration (e.g. application of appropriate fertiliser, herbicides, replacement of failed stock, maintenance of fences, gates and stiles).

Cumulative effects

B.1.69 Incremental impact (i.e. impact of more than one development upon a single environmental factor) is not considered relevant to the assessment of soil resources and agriculture, as these are by nature site specific. Furthermore, impacts associated with soils and agriculture are not considered relevant to assessing likely combined impact of environmental factors upon single receptors (e.g. combined impact of noise, dust and visual impact at one receptor). There are thus no cumulative impacts anticipated on land use, soil resources or land classification following the proposed development.

Residual impacts

B.1.70 The proposal will result in the permanent loss of 48ha of ALC grade 2 and subgrade 3a agricultural land. In areas of the site not subject to built development, the soil profiles would be left intact but the landuse would no longer be agricultural. Other identified potential impacts can be properly mitigated and no other residual soil or land use impacts are considered.

Conclusions

B.1.71 The baseline characteristics of soil resources, agricultural productivity and land use have been assessed. The potential impacts of the development have also been assessed and details of mitigation measures described. Soil profile characteristics have been investigated across the agricultural areas of the site using a hand-held auger capable of sampling to 120cm depth. Other information has been obtained or researched using available reference texts and plans.

B.1.72 The area of agricultural land surveyed is currently utilised for arable cropping. Soils are mapped as belonging to the Banbury and Denchworth soil associations, which are both widespread around Banbury.

B.1.73 The primary limitations to Agricultural Land Classification are droughtiness and soil wetness.

B.1.74 Topsoil and subsoil resources will be stripped in advance of each development phase commencing and, where possible, retained on site for use in the restoration scheme.

B.1.75 The potential impact of the development upon agriculture, soils and landuse has been assessed. The proposal would result in the permanent loss of approximately 48ha of best and most versatile quality agricultural land to built development, with additional areas becoming non agricultural due to the change in landuse. The permanent loss of best and most versatile quality agricultural land is considered a high adverse impact although best and most versatile quality land is widespread in the area around Banbury.

B.1.76 Potential negative impacts could occur to topsoil quality (for example structure, nutrient status, organic activity) if handling, stockpiling and restoration is not carried

out correctly. Wherever possible, soil resources would be retained on site for use in restoration, although limited resources may require removal for suitable use off site if a surplus is identified. Mitigating measures, however, would be adopted to reduce such potential impact and the significance of such impacts is therefore considered to be low to moderate adverse.

B.1.77 The significance of potential adverse impact upon agricultural drainage both on and off site is considered low to neutral, this would be controlled by appropriate drainage design for the proposed development.

B.2 GEOLOGY AND GROUND CONDITIONS

Introduction

B.2.1 This chapter of the ES was prepared by WA and should be read in conjunction with Section A of the ES which provides a description of the proposed development.

B.2.2 The Wykham Farm site predominantly comprises arable fields. An assessment of the ground conditions at the site has been undertaken on a provisional basis by review of available information regarding the conjectured geology beneath the site together with the sites historical land uses. The potential impacts upon the ground water environment is assessed in chapter B.3 – Water Resources.

B.2.3 Desk study researches have been undertaken to identify any potential contaminative sources within the site which may impact upon receptors at the site. The desk study also aimed to identify the existing and potential receptors which may be present and pathways by which the receptors may be exposed to any identified sources of contamination at the site.

B.2.4 The desk study assessed the broad likely geotechnical setting of the site based on published geological mapping of the site. The results from the desk study have been used to determine the requirement for future site investigation works and to produce this chapter of the Environmental Impact Assessment.

Assessment methodology

B.2.5 The applicable legislative and regulatory framework considered relevant to the Wykham Farm site is summarised as follows:

- National Planning Policy Framework 2012;
- Town and Country Planning Acts;
- Health and Safety Acts;
- The Construction (Design and Management) Regulations 2007;
- Environmental Protection Act 1990 and Environment Act 1995.

B.2.6 The following guidance relates to the investigation of potentially contaminated land in the UK:

- BS 5930 British Standard Code of Practice for Site Investigations;
- BS 10175 British Standards Institution (2011) Investigation of Potentially

Contaminated Sites;

- BS EN 1997: Eurocode 7: Geotechnical Design.
- CIRIA publications including C665 Assessing risks posed by hazardous ground gases to Building;
- Department of Transport Specification for Highway Works;
- Environment Agency (2004) Model Procedures for the Management of Contaminated Land (CLR11);
- Environment Agency and NHBC (2008) Guidance for the safe development of housing on land affected by contamination, EA R&D Publication 66;
- Environment Agency (2000) Technical Aspects of Site Investigation (2 volumes) R&D Technical Report P5-065.
- Environment Agency (2000) Secondary Model Procedures for the Development of Appropriate Soil Sampling Strategies for Land Contamination, R&D Technical Report P5-066; and
- NHBC Standards (2011) Chapter 4: Foundations.

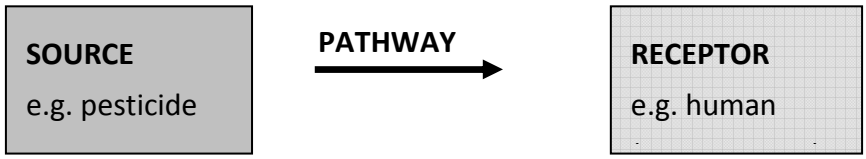
B.2.7 The desk study looked to compile information from a range of sources to provide an assessment of the ground conditions at the site. At this time no intrusive investigations have been undertaken within the site boundary. Available information has been used to formulate a model of the site conditions so as to assess the likely ground conditions which may be expected across the site. These data sources included the following:

- Geological Mapping and memoirs published by the British Geological Survey (BGS);
- Landmark Information Group 'Envirocheck' Report (Appendix B2.1)
- Ordnance Survey County and National Grid Series Plans;
- Wardell Armstrong archives; and
- BR211 – Radon, Guidance on Protective Measures for New Dwellings.

B.2.8 Data gained from undertaking the desk study researches outlined above was analysed to determine the likely ground conditions present beneath the site. The assessment also aimed to establish the requirement for intrusive explorations within the site and to aid the targeting of investigative works to focus on any issues noted within the desk study.

B.2.9 Consideration will be given to the way in which the proposed development may affect the ground conditions at the site. The evaluation will take into account the effects of the change of land use together with the potential impact of the construction phase and end use of the land.

B.2.10 The assessment of contamination risk uses a conceptual site model to establish potential connecting links between a contaminant source and a sensitive receptor via an exposure pathway. The fundamental concept is that, without each of the three elements (source, pathway and receptor) there can be no contamination risk. Thus the presence of contamination at a particular location does not necessarily represent an associated risk. The conceptual model may be illustrated as follows:



B.2.11 In order to assess the risk posed to a receptor (e.g. site end-users) by a contaminant the sensitivity of the receptor is taken into consideration. For example, the concentration of contamination acceptable at a site to be developed as a residential property, with a garden used to grow vegetables and accessible to young children, is lower than that acceptable on a commercial site, where soil is exposed only in minor areas of soft landscaping, and the only long-term users of the site are adults. Equally, a site overlying a major aquifer supplying potable water to a large population will be considered more stringently than a site overlying impermeable strata with only minor seepages of groundwater.

B.2.12 Potential receptors have been identified with regard to existing land uses and the new uses proposed by the planning application:

- Future users - construction workers and end users of the residential development, commercial uses and open spaces;
- Controlled water – groundwater (Secondary A Aquifer/surface water (issue and drainage ditch); and
- Flora/fauna on site.

B.2.13 Criteria for assessing the significance of the potential effects have been based on a qualitative assessment of the receptor sensitivity and the predicted magnitude of change from the baseline as a result of the development. Receptor sensitivity has been defined as shown in Table B2.1 and the criteria used to assess the magnitude of change are set out in Table B2.2.

Table B2.1 Receptor sensitivity

Sensitivity	Receptor
High	HUMANS SURFACE WATER GROUNDWATER
Medium	BUILDING STRUCTURES/MATERIALS
Low	FLORA/FAUNA

Table B2.2 Magnitude of change

Magnitude	Change predicted as a result of the proposals (may be positive or adverse)
High	Construction activities may result in a major pollution release or clean up. The development introduces or removes a new large scale source of potential contamination or potential receptor. The development introduces or removes a number of pathways/pollutant linkages.
Medium	Construction activities may result in a minor pollution release or clean up. The development introduces or removes a new small scale source of potential contamination or potential receptor. The development introduces or removes a pathway for pollution linkage.
Low	Typical construction-related pollutant release. Temporary pathway or receptor introduced during construction period only. Temporary removal of receptor.
Negligible	No change identified.

B.2.14 The magnitude of change predicted and the sensitivity of identified receptors have been used to qualitatively assess the impact significance of the proposed development as shown in Table B2.3. Impacts have the potential to be either adverse or beneficial.

Table B2.3 Impact significance

Receptor Sensitivity	Magnitude of change			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible

B.2.15 The following are examples of impacts according to the above classification:

- Major adverse: Short term severe or long-term moderate effect on human health. Severe temporary or permanent reduction in the quality of potable groundwater or surface water resource;
- Moderate adverse: Long-term minor or short-term moderately detrimental effect on human health. Moderate local scale reduction in the quality of potable groundwater or a surface water resource, that is reversible with time. Reversible widespread reduction in the quality of groundwater or surface water resources used for industrial abstraction. Long-term permanent structural impact on construction materials;
- Minor adverse: Short-term minor detrimental effect on human health. Temporary slight or moderate detrimental effect on the quality of groundwater used for, or with the potential for use for industrial abstraction. Reversible impact on appearance of construction materials;
- Negligible: No appreciable impact on human, potable groundwater or surface water resource;
- Minor Beneficial: Minor reduction in risk to human health. Slight local scale improvement in quality of potable groundwater or surface water resources. Moderate, local scale improvements to groundwater or surface water resources used for, or with the potential for use for industrial abstraction;
- Moderate Beneficial: Moderate reduction in risk to human health. Moderate local scale improvement to the quality of potable groundwater or surface water resource. Significant improvement to the quality of groundwater resources used for industrial abstraction; and
- Major Beneficial: Major reduction in risk to human health. Significant local scale or moderate to significant regional scale improvement to the quality of potable groundwater or surface water resource.

B.2.16 This assessment has been undertaken using the information available from the desk study only. At present no site investigation has been undertaken within the site boundary.

Baseline conditions

B.2.17 The full description of the site area is given within Section A of the ES.

B.2.18 Particular aspects of the site area may affect the ground conditions:

- Arable fields - it is considered likely that pesticides and fertilizers will have been used across the site although the potential for harmful contaminants associated with these is considered to be low.

B.2.19 The British Geological Survey (BGS) published geological mapping sheets SP 43 NE and SP 43 NW has been reviewed to establish the geological setting of the site. The geological mapping for the site indicates that the majority of the site is directly underlain by the Whitby Mudstone Formation which typically comprises fossiliferous mudstone, siltstone, and occasional limestone bands The eastern section and south western corner of the site is underlain by the Marlstone Rock Formation which generally comprises of ferruginous limestone, interbedded ferruginous sandstone and subordinate ferruginous mudstone. It is known that elevated concentrations of metals and metalloids, particularly arsenic can be found in soils associated with the Marlstone Rock Formation.

B.2.20 It is likely that made ground materials (i.e. reworked/ploughed natural materials) are present across the site given the current and historical land use as arable farming.

B.2.21 The Environment Agency groundwater vulnerability map for the site has been reviewed. The mapping indicates that the northern and central section of the site is underlain by strata (the Whitby Mudstone Formation) which are classified as unproductive strata. The strata recorded to underlie the south western and eastern sections of the site (i.e. the Marlstone Rock Formation) are classified as a 'Secondary A' aquifer.

B.2.22 A number of field drains exist incorporated into and adjacent to the hedgerows across the site. It is understood that these drainage ditches are ordinarily dry with flow being resumed during prolonged or heavy rain episodes.

B.2.23 There are no recorded pollution incidents to controlled waters within 1km of the site.

B.2.24 There are 5 water abstractions located within 1km of the site which are recorded to be for general farming and domestic use. In addition there is a water abstraction licence held by Thames Water Utilities Ltd for public potable water supply located 1370m to the south of the site at Bodicote Pumping Station on Sor Brook, which extracts water from a surface water source.

B.2.25 There are 2 recorded landfills located within 1km of the site. Both landfills are located approximately 900m north of the site, and are recorded to hold inert and industrial waste and fly tipped waste. However due to the distance from site they are not considered to have any impact to the site.

Potential Impacts

B.2.26 The desk study research has identified a low potential for soil contamination.

B.2.27 The desk study research also identified several other elements which will need to be considered at the detailed design stage of the proposed development, as detailed below;

- Localised softening of shallow clay – due to the historical and current land use, where surface water has permeated the shallow clay materials. This localised softening may require foundation depths to be increased to stiff clay at greater depth;
- Desiccation of clay materials – Where trees and large shrubs have been long established there is considered to be a potential for localised dessication of the shallow clay materials. Where long established vegetation is removed there will be a requirement to extend foundations to a moisture stable horizon which may require deepened foundations where desiccation is identified;
- Shrinkability of clay materials – the conjectured ground conditions across the

site indicate the presence of shallow clay materials across the site. The depth of foundations will also need to take account of trees planted as part of any landscaping works within the vicinity of buildings and other structures; and

- Soils contamination –It is considered that the potential for the site to be contaminated is low and restricted to use of pesticides and potentially naturally elevated metals and metalloids derived from the Marlstone Rock Formation strata.

B.2.28 Consideration has also been given to the impact that the proposed development may have on the ground conditions at the site. The potential impact may be considered in three particular stages;

Construction Phase Impacts

B.2.29 There are a number of potential impacts which may result from the construction phase of the development. Removal of topsoil materials and tracking of plant across the superficial clay ground may cause additional weathering and disturbance to the clay materials and could result in softening and rutting of the surface.

B.2.30 It is possible that contamination of the ground may occur due to activities relating to the development, these could include spillage of oils and fuel from plant working at the site, chemical spillages and other contaminants, and potential for construction waste such as broken brick and tiles and waste concrete and cement to become incorporated into the surface of the ground.

Impacts Relating to Land Use

B.2.31 The layout of the proposed development may also have an impact on the ground conditions. Removal or incorporation of trees and shrubs into the development could have an effect on the condition of the ground. In addition, large areas of hardstanding are likely to reduce the amount of water ingress into the soils and potentially affect the ground conditions.

Potential Residual Impacts

B.2.32 Following development of the site the ground will be affected by whatever activities are undertaken within the individual housing plots. This could include spillages of oils, fuels or other chemicals associated with vehicle and household activities.

Similarly the incorporation of roads into the development provides further potential for contamination of the ground. The presence of sewerage within the ground also presents a potential for pollution of the site due to leakage or overflow from the sewers. However mitigation such as best practice and appropriate infrastructure design make these residual impacts negligible.

Table B2.4 Significance of potential impact without mitigation

Receptor	Sensitivity	Magnitude of change as a result of development			
		High	Medium	Low	Negligible
Human	High			Moderate	
Surface water	High				Negligible
Groundwater	High			Moderate	
Built development	Medium			Minor	

Mitigation Measures

B.2.33 In terms of minimising the impact of the development on the ground conditions there will be a requirement during the development phase to ensure that materials and chemicals used during the construction will not impact the ground adversely.

B.2.34 The risk of accidential spillages or leaks on the site will be mitigated by following good management practices and preparation of a Pollution Control Strategy prepared in accordance with Environment Agency guidelines. This will include actions such as:

- Storage of materials in secure containers in safe locations.
- No waste products or packaging should be burnt on the site.
- Fuel to be used for construction plant should be stored in tanks which will be temporarily bunded with 110% of the tanks capacity. Refuelling points should be located within the bunded area and all tanks securely locked when not in use. Construction should follow guidance by the Construction Industry Research and Information Association (CIRIA Report 163, The Constrction of Bunds for Oil and Storage Tanks).

B.2.35 Construction activities will also require materials management plans to be prepared and implemented to audit waste materials and minimise potential adverse impacts to the ground.

B.2.36 The change of use of the site has been considered during the design of the proposed layout. Where possible the hydrogeological conditions at the site will be taken into account at the detailed design stage of the scheme to ensure the effect on the near surface soils is minimised.

B.2.37 There are few measures that may be put in place to minimise the impact that individuals occupying the proposed housing may have on the ground conditions, however the assumed clayey nature of the near surface soils will help to contain any spillage or contamination within the discrete location and to impede transmission.

Residual Impacts

B.2.38 In order to inform the detailed design of foundations for the development, a site investigation is recommended at some point in the future prior to construction taking place.

B.2.39 The use of best practice and appropriate measure to reduce contamination through pollution, as outlined in para B2.34 will ensure these effects will not be significant.

Table B2.5 Significance of residual impact

Receptor	Sensitivity	Magnitude with mitigation incorporated			
		High	Medium	Low	Negligible
Human (construction)	High	-	-		Negligible
Human (occupation)	High	-	-	-	Negligible
Surface water	High	-	-	-	Negligible
Groundwater	High	-	-	-	Negligible
Built development	Medium	-	-	-	Negligible

Cumulative Impacts

B.2.40 There are a number of proposed development schemes located within the immediate vicinity of the site. Given that the current land use of the surrounding area is predominantly arable farming and the surrounding geology is also similar to the geology beneath the site no significant cumulative effects are predicted.

Summary

B.2.41 The potential environmental impact with regard to ground conditions at the site has been assessed. The assessment has taken account of the potential for geotechnical and contaminative issues as a result of the existing ground conditions and as a result of the development of the site.

B.2.42 The existing ground conditions have been conjectured from the desk study research undertaken. The site is recorded to have been arable farm land from the time of the earliest reviewed mapping in 1882 (refer to Envirocheck Report). The ground conditions are conjectured to comprise reworked/ploughed natural materials overlying the Marlstone Rock Formation (which typically comprises of ferruginous limestone, sandstone and subordinate mudstone) and the Whitby Mudstone Formation (which generally comprises fossiliferous mudstone, siltstone, sandstone and occasional limestone bands). Elevated concentrations of metals and metalloids, can be found in soils associated with the Marlstone Rock Formation. The potential for soils contamination from the use of harmful pesticides is considered low.

B.2.43 The impact that the proposed development may have on the ground conditions has also been considered. There is potential for disturbance and contamination of the ground during and after the construction of the development at the site. The principal potential effect is during the building works at the site with the risk of chemical spillages and disturbance of the ground by construction plant.

B.2.44 It is likely that a site investigation will be required to assess the ground conditions at the site at some point in the future in order to inform the detailed design of foundations prior to construction. It is considered that investigations will include machine excavated trial pits and boreholes to examine the ground and to obtain samples of the soils for both geotechnical and geochemical analysis.

B.2.45 Detailed design of the development and management of the construction phase of the development will minimise the impact on the ground. This will include consideration of the hydrogeological regime at the site along with design to ensure that the development does not adversely affect the underlying strata. Management of the construction with appropriate materials handling and waste minimisation will also reduce the potential for impact on the ground.

B.2.46 It is considered that following development of the site with appropriate precautions there will not be significant residual effects related to the ground conditions at the site.

B.3 WATER RESOURCES

Introduction

B.3.1 This chapter of the ES has been prepared by WA. Section A of this ES provides a description of the proposed development. This chapter considers the impacts upon the water environment associated with the proposed development at Wykham Park Farm. Potential impacts of the development upon the hydrology and water quality aspects of the water environment have been identified and assessed.

Planning Policy Context

B.3.2 Water resources are managed and protected under UK legislation and regulations consistent with European Community Directives (EU Water Framework Directive (WFD) 2000/60/EC and The EC Groundwater Directive (2006/118/EC)). Where relevant, the assessment takes into account the legislative protection afforded to water resources, through relevant plans and policies detailed below:

B.3.3 The main legal framework is set by the following:

National Legislation & Planning Policy

B.3.4 In relation to water resources, the relevant legislative framework includes the following:

- Flood and Water Management Act 2010;
- Water Act 2003, as amended;
- Water Industry Act 1991 (as amended by the Water Act 2003);
- Land Drainage Act 1991, as amended;
- Water Resources Act 1991;
- Environment Act 1995, as amended;
- The Conservation of Habitats & Species Regulations 2010;
- EU Water Framework Directive (WFD) 2000/60/EC;
- The EC Groundwater Directive (2006/118/EC) and Groundwater Regulations 2010;
- National Planning Policy Framework (NNPF) 2012;
- Technical Guidance National Planning Policy Framework (TGNPPF) 2012;
- Environmental Permitting (England & Wales) Regs 2010;
- Control of Pollution: Oil Storage (England) Regs 2001; and
- Environmental Damage (Prevention & Remediation) Regs 2009.

Methodology

B.3.5 The methodology adopted in this assessment has focused on the identification and evaluation of key sensitive receptors by undertaking a desk-based study and then focussing specifically on identifying impact 'types' and risks which have the potential to have a beneficial or adverse impact on a sensitive receptor. The level of significance of any predicted effects has been determined using the three stage process outlined below.

B.3.6 The assessment of potential impacts and significant effects has been an iterative process where the results of the assessment process influenced the design of the scheme and the development of mitigation measures.

B.3.7 A separate Flood Risk Assessment (FRA) (Wardell Armstrong LLP, 2013) has been prepared in support of the planning application, and is referred to within this chapter. The FRA (Wardell Armstrong LLP, 2013) can also be reviewed in Appendix B3.1 of this report).

Value/Sensitivity of the Resource Receptor

B.3.8 Establishing the baseline environment allows water environment receptors to be identified. Following this a value is assigned to each receptor based on the criteria in Table B3.1 overleaf. This guidance for estimating the value and sensitivity of an environmental resource/receptor has been derived based on a variety of legislative targets and standards as referenced in paragraph B3.5

Table B3.1 – Indicative criteria for estimating the value /sensitivity of environmental receptors

Value	Criteria
High	A water resource which is of high quality and highly sensitive to change. More specifically, a surface water resource of pristine or near pristine water quality, where water quality is not significantly affected by anthropogenic factors, and where water quality does not affect the diversity of species of flora and fauna. Includes sites with international and European nature conservation designations with water-dependent ecosystems. A groundwater aquifer constituting a valuable resource because of high quality and yield, extensive exploitation for supply, or designated sites of nature conservation are dependent on groundwater. A floodplain or flood storage area necessary to protect highly vulnerable development and valued resources from flooding.

Value	Criteria
Medium	A water resource of medium quality and medium sensitivity to change. More specifically, a surface water resource with a measurable degradation in its water quality as a result of anthropogenic factors, where the resulting water quality has only limited effect on the species diversity of flora and fauna in the water resource. Includes non-statutory sites of regional or local importance designated for water dependent ecosystems. A groundwater aquifer of limited value because its quality does not allow potable or other quality-sensitive uses (but which may be used for agricultural or industrial purposes) and where exploitation is not extensive, or where local areas of nature conservation are known to be sensitive to groundwater quality. A floodplain or flood storage area protecting development and resources which are classified to be of medium vulnerability.
Low	A water resource of low quality and low sensitivity to change. More specifically, a surface water resource with poor water quality resulting from anthropogenic factors, where the species diversity of flora and fauna is greatly affected by significant water quality degradation. A groundwater aquifer of low water quality and/or very low permeability that make exploitation of the aquifer unfeasible, or where changes to groundwater are not expected to have an impact on local ecology. A floodplain or flood storage area with limited or no flood protection value.
Negligible	A water resource of little or no interest.

Nature and Magnitudes of Impacts

B.3.9 Potential impacts resulting from the proposed development are then identified along with the magnitude of the impact. The criteria for identifying the magnitude are shown in Table B3.2. By considering the value of the receptor and the magnitude of the impact the significance of the effect on the receptors and receptor's attributes (such as water quality) during both construction and operation can be established using the matrix in Table B3.3.

Table B3.2 – Indicative criteria for determining the magnitude of the impact

Magnitude of impact	Criteria
Major	Loss (or gain) of a water resource or a major shift away from the baseline conditions. Effects that result in a fundamental change to water quality condition either by a relatively high amount over a long-term period or by a very high amount over an episode such that a water resource is greatly changed from the baseline situation. Any change that downgrades a site from good status (as this does not comply with the Water Framework Directive) or results in a loss of salmonid fisheries (or a similar gain would be

Magnitude of impact	Criteria
	beneficial). For groundwater, a major permanent or long-term change to groundwater quality or available yield. Existing resource use is irreparably affected. Changes to quality or water table level that have a major impact on local ecology. (If water availability is increased as a result of the development this is considered a benefit). For floodplains, a major loss (or gain through defence or compensation schemes) of flood storage capacity or change to risk of flooding.
Moderate	Loss (or gain) of a part of a water resource or a measurable shift from the baseline conditions. Effects that may be long-term or temporary. Effects that result in a change in the ecological status or productivity/commercial value of a water resource. Changes to the local groundwater regime predicted to have a slight effect on resource use but not rule out any existing supplies. Minor impacts on local ecology may result. For floodplains, a moderate loss (or gain) of flood storage capacity or change to risk of flooding.
Minor	Localised effect on a water resource or a minor shift away from the baseline conditions. Changes in water quality that are likely to be relatively small, or be of a minor temporary nature such that water resource ecology or commercial value is slightly affected whether beneficial or adverse. Changes to groundwater quality, levels or yields that do not represent a risk to or benefit an existing resource use or ecology. For floodplains, a minor loss (or gain) of flood storage capacity or change to risk of flooding.
Negligible	Very slight change from the baseline conditions such that no discernible effect upon the water resource's ecology results. Very slight change from groundwater baseline conditions approximating to a 'no change' situation.

B.3.10 The nature and characteristics of impacts have been described to enable their magnitude to be determined. The nature of the impacts has first been expressed as:

- Adverse – detrimental or negative impacts on an environmental resource or receptor;
- Beneficial – advantageous or positive impact on an environmental resource or receptor; or
- Negligible – an impact on a resource/receptor of insufficient magnitude to affect the use/integrity.

B.3.11 In the context of the proposals for the application site, short to medium term impacts are generally considered to be those associated with the construction phase of the development. Long term impacts are those that will have a lasting effect once the development is completed and operational.

Significance of Effect

B.3.12 The assessment of significance is based on the nature and magnitude of the impact and the value/sensitivity of the receptors/resources. Having established the sensitivity/value of the resource/receptor in Stage 1 and the magnitude/nature of each impact in Stage 2, the matrix in Table B3.3 has been used to determine the significance level of impacts.

Table B3.3 Criteria for estimating the significance of potential impacts

Magnitude of Potential Impact	**Value of receptor**			
(adverse/beneficial)	**High**	**Medium**	**Low**	**Negligible**
Major	Major Significant Effect	Moderate significant effect	Minor significant effect	Minor significant effect
Moderate	Moderate Significant Effect	Moderate significant effect	Minor significant effect	No significant effect
Minor	Minor Significant Effect	Minor significant effect	No significant effect	No significant effect
Negligible	No Significant Effect	No significant effect	No significant effect	No significant effect

B.3.13 Many of the long term potential impacts a development can impose on the water environment can be avoided or prevented through the implementation of effective and sustainable project design proposals and as such do not require mitigation measures. However following the implementation of preventative design measures, potential impacts that cannot be 'designed out' have been identified. The predicted effects and the significance of each potential impact relating to the short-term construction activities and the long term operation of the development has been determined in addition to an appropriate and germane level of mitigation. Mitigation

measures aim to prevent adverse effects from occurring and to ensure that those that do occur are within an acceptable level.

B.3.14 Opportunities for impact mitigation will also occur throughout the detailed design and planning process with the objectives of:

- finding better alternatives and methods of construction and site operation;
- enhancing the environmental and social benefits of a proposal;
- avoiding, minimising or removing adverse impacts; and
- ensuring that residual adverse impacts are kept within acceptable levels.

B.3.15 If an impact with an adverse significant effect cannot be prevented or mitigated within an acceptable level then potentially there is a residual impact on the receptor where the receptor is altered. Residual impacts have been determined on a qualitative basis as part of this chapter.

B.3.16 Consultation has been undertaken with the Environment Agency (EA) and Thames Water (TWUL) regarding site specific conditions relating to surface water drainage and flood risk. Consultation responses are contained in Appendix 3 and 4 of the FRA Report (Wardell Armstrong LLP, 2013).

Assessment Area

B.3.17 The Assessment Area is illustrated on drawing number B3.1, and comprises the application site and a 1km buffer zone around the site boundary to identify baseline conditions. However in order to determine the cumulative effects of a number of proposed development schemes within the immediate context of the application site, baseline conditions have also been established for water resources and infrastructure that may be indirectly impacted upon outside of the locality of the Assessment Area.

Baseline Conditions

B.3.18 This section sets out the existing conditions of the application site with consideration to current 2012 activities in the area. Past land uses within the application site include mainly agricultural activities which will potentially result in elevated nutrient and pesticide levels.

Surface Water Features and Drainage

B.3.19 The application site is rural in nature, comprising arable farm land. The highest elevation of the site is set at approximately 133mAOD to the north of the site. The land then falls away to the south east and south west to an elevation of approximately 125mAOD.

B.3.20 The principal watercourse within the Assessment Area is the Sor Brook located approximately 1km to the south of the site. The Sor Brook meanders in a south easterly direction before confluencing with the River Cherwell approximately 5km downstream. The Sor Brook is classified as a Main River and is therefore regulated by the Environment Agency (EA).

B.3.21 Within the application site itself there is a field drainage ditch which is shown to convey a ground water issue according to Ordnance Survey (OS) Maps. The ditch is located along the southern boundary of the site running in an easterly direction for approximately 400m. Site inspections conducted as part of the FRA revealed the ditch to be overgrown and dry at the time. Further downstream, still within the site, the ditch becomes culverted by a 375mm diameter pipe, which was found to be almost 100% blocked. The topographical survey shows a second headwall approximately 5m downstream, indicating that the ditch comes out of culvert and continues in open channel towards the site boundary.

B.3.22 From the site boundary, OS maps show the ditch to continue to run in an easterly direction for a further 160m before discharging into a pond located within the vicinity of Wykham Farm Cottage. From the pond the ditch course continues in a southerly direction where it becomes culverted for a short distance under Wykham Lane. The water flows in open channel downstream of Wykham Lane and eventually discharges in to a reservoir. From the reservoir the unnamed watercourse continues in a southerly direction for approximately 500m before discharging into the Sor Brook.

B.3.23 This ditch/watercourse is classified as an Ordinary Watercourse (non-Main River status and therefore not EA maintained) and is therefore the responsibility of the Lead Local Flood Authority, which is assumed to be Cherwell District Council. Regardless of classification the LLFA will enforce the maintenance of this drainage

ditch under the Land Drainage Act. There are no other major surface water receptors present within the study area other than local ditch networks draining the surrounding agricultural land.

Surface Water Quality

B.3.24 The Assessment Area is located in the Thames River Basin District. The only watercourse within the Assessment Area to have been monitored and assessed by the EA according to ecological and chemical environmental standards transposed from the WFD is the Sor Brook. These results are published on the EA's website and provided in more detail in the EA's River Basin Management Plan (RMBP) Annex B, which can be referenced in Appendix B.3.2 Thames River Basin District (EA, Dec 2009). The WFD results for the Sor Brook are summarised in Table B.3.4.

B.3.25 Ecological status is measured on a scale of high, good, moderate, poor and bad. Chemical status is recorded as a good or fail. Essentially the WFD aims to protect, enhance and restore all surface and groundwater bodies to a status of 'Good' by the year 2015, which is defined as a slight variation from undisturbed natural conditions in natural water bodies. The WFD also requires that ecological status or potential does not decline over time.

Table B3.4: Summary WFD classification data for the Sor Brook from the Thames RBMP

Category	Sor Brook (Broughton to Adderbury)
Waterbody ID	GB106039037260
Typology Description	Low, Small, Calcareous
Hydromorphological Status	Not Designated
Current Ecological Quality	Good Status
Current Chemical Quality	Does not require assessment
Status Objective	Good by 2015
Protected Area	Yes – Under the Nitrates Directive, Drinking Water Protected Area and Freshwater Fish Directive

B.3.26 The assessment indicates that in terms of ecological quality there is a moderate deviation from undisturbed or natural conditions in the Sor Brook within the Assessment Area and as such the Sor Brook is currently meeting WFD targets. The

full WFD results for each ecological element tested for can be referred to in Appendix B.3.2.

B.3.27 The ditches within the site that drain to the Sor Brook however have not been assessed in terms of WFD targets. It is to be expected that the water quality of such a ditch course is relatively poor with frequent use of agricultural chemicals and runoff from adjacent farming land farm yards would further contribute to the deterioration of water quality which can be exacerbated by seasonally low flows.

Nitrate Vulnerable Zones

B.3.28 According to the EA's web based mapping service 'My Backyard' the whole of the assessment area is designated as a Nitrate Vulnerable Zone (NVZ) meaning land draining to waters polluted by nitrates as defined by Defra, which is corroborated by the findings of the EA's WFD monitoring of the Sor Brook. This is typical of the agricultural nature of the surrounding land, where over 60% of nitrate entering water is from agricultural land. It indicates that the local watercourses are affected by runoff from arable land which may contain high concentrations of fertilisers. This is characteristic of many English waters, both ground and surface, which either remain high or are increasing in levels of nitrate as can be observed from Defra's national NVZ maps. Nitrate pollution is of concern as it is harmful to human health and has to be removed before water can be supplied for human consumption. In addition excess levels can damage the water environment and associated ecology.

Groundwater Receptors

B.3.29 According to British Geological Survey (BGS) records the majority of the application site is underlain by Whitby Mudstone formation. The eastern and south western section of the site however is underlain by the Marlstone Rock Formation. It is the latter bedrock geology that has been designated as a Secondary A aquifer by the EA. Secondary A aquifers are permeable layers capable of supporting water supplies at a local rather than a strategic level in addition to forming an important source of baseflow to rivers. It is anticipated that this aquifer is sustaining the issue of groundwater within the application site and could be classed as a potential receptor for any potential contaminative activities on site.

B.3.30 There are no Groundwater Source Protection Zones (GSPZ) present within the assessment area. The nearest GSPZ is located approximately 18km to the southeast of the application site in Chipping Norton, which is of sufficient distance not to be affected by the proposed development.

B.3.31 The groundwater body underlying the Assessment Area is designated under the WFD and has been subject to monitoring by the EA and assessed against Environmental Quality Standards (EQS) set out in the WFD, which involves a number of quantitative and chemical tests. The result of each test is combined to give an overall status of the groundwater chemical and quantitative assessment. The worst case classification/status achieved by each of the tests is taken as the overall status. The latest WFD results for the groundwater body underlying the Assessment Area can be referred to in Appendix B.3.2.

B.3.32 These results show that the groundwater body is currently achieving a good status for all physical and water quality parameters tested. This means that the groundwater body is currently meeting Drinking Water Protected Area (DrWPA) objectives and groundwater pollutants are below threshold values as set by the WFD and Groundwater (Daughter) Directive (2006/118/EC). Findings also show that there is strong evidence of source-receptor pathways where the good water quality of the groundwater body is having a beneficial impact on the water quality of receiving surface waters such as the River Sor.

Water Resources and Future Growth

B.3.33 The EA manages water resources at a local level through the use of Catchment Abstraction Management Strategies (CAMS). Water supplied to the application site is subject to the policies set out within the Cherwell CAMS which was published in July 2005 and updated in 2007. The document outlines how the EA will manage water, where water is available and how it will licence the abstraction of this water. The application site and the entire length of the Sor Brook fall within the EA's Water Resource Management Unit (WRMU) 2, which has been classified as 'No Water Available'. This means that there is no water available for further licensing at low flows but may be available at higher flows.

B.3.34 The CAMS document makes reference to Thames Waters' licence for potable water supply abstracted from the Sor Brook (see paragraph B.3.39 for details) which is located within WRMU 2. This licence is constrained by a 'hands off' flow condition where if the rate of flow in the Sor Brook drops beyond a prescribed level, abstractors are notified by the EA to cease all abstraction of water. If the proposed development is to be supplied via water abstracted from the Sor Brook, then the status of the WRMU and conditions on the existing abstraction licence could potentially have an impact on how the development is supplied by water and the reliability of that water supply. As such Thames Water may seek a developer contribution toward any offsite improvement works to the water supply infrastructure, particularly if strategic schemes have been put in place to source water required for future growth outside the catchment. The EA would also seek for the proposed development to incorporate water efficiency measures.

B.3.35 A water cycle study (WCS) covering the Banbury Catchment has not been carried out by Cherwell District Council and therefore could not be used to determine the baseline conditions in relation to how water supplied to the Banbury catchment is sourced, the condition of that water source and the operational performance of the public sewerage infrastructure. As such some assumptions have been made in terms of the operational impacts and effects of the development on water resources and the public sewerage system.

Abstraction Licences

B.3.36 An Envirocheck (Landmark) Report (August 2012) (Appendix B2.1) has been obtained, which provides details of licensed water abstraction within the assessment area.

B.3.37 There are no identified abstraction points located within the application site itself. However there are five identified licensed abstractions within the assessment area, three sourced from groundwater and two from surface water. Water taken from all five abstractions is used for either general agricultural (farming) or domestic purposes. The largest of the licensed abstractions is located at Wykham Park Farm and is used for water storage and spray irrigation. The license allows a maximum daily abstraction of up to 818m^3 and a yearly rate of 27,276m^3.

B.3.38 The remaining licensed abstractions within the assessment area are relatively minor in magnitude and also relate to general agricultural use.

B.3.39 A Thames Water Utilities Ltd public potable water supply pumping station is identified just outside of the assessment area on the Sor Brook. Bodicote pumping station is licensed to provide a daily rate of 4,546m^3 and an annual rate of 1,663,836m^3. The proposed development at Wykham Park Farm may have an impact on the conditions of this abstraction licence through the increase in demand associated with a proposed mixed use development of this scale.

B.3.40 The extents of the Secondary A aquifer underlying the assessment area and the proximity of groundwater abstraction points to the application site , could have the potential to create valid source-receptor pathways for the conveyance of contaminants during the construction and operation of the proposed development. Such activities within the application site could also adversely affect the quality of the ground water supported within the Secondary A aquifer and associated surface waters.

Discharge Consents

B.3.41 The Envirocheck report (Appendix B2.1) also contains a record of discharge consents within the assessment area. The report provides details of current and revoked consents.

B.3.42 Of the remaining current (active) licenses, there is a domestic discharge consent associated with farm cottages in the near vicinity of the application site, considered likely to be discharge from a number of septic tanks serving the properties. It is considered that the provision of a public sewerage scheme required to facilitate the proposed development may also likely meet the sewerage needs of surrounding existing minor development.

B.3.43 There is a further domestic discharge consent registered to Tudor Hall School (covering three properties) covering the discharge of final sewage effluent from a private package treatment works or septic tank to the ground. On a catchment scale basis it is considered that such discharge consents will have little impact on the

water quality of the Secondary A and as such are not considered further within chapter.

Flood Risk

B.3.44 The Sor Brook is of sufficient distance so as not to impact the application site in terms of fluvial flooding. The Brook is approximately 1km to the south of the application site and from a review of contours shown on Ordnance Survey (OS) mapping, the site is elevated over 20m above the Sor Brook.

B.3.45 There is no information regarding the floodplain associated with the ditch system within the site. The watercourse is shown to issue within the application site and to be of minor form. Flood risk to the site from this minor watercourse system is considered low, as the catchment area draining to this location is limited.

B.3.46 The minor watercourse is likely to form an important function in terms of land and groundwater drainage for the application site and should therefore be maintained and incorporated within the master planning of the development. To this end, flood risk from this source will therefore be mitigated through appropriate design, stand-offs and exceedence flood flow routing.

B.3.47 The EA's online Flood Map identifies the application site to be entirely located within Flood Zone 1 (Low Probability of Flooding from sea or rivers) as illustrated on drawing number B.3.1. As such, according to Table 3 in the Technical Guidance to the National Planning Policy Framework (TGNPPF), all uses of land are appropriate in this zone. However for application sites comprising one hectare or above the risk of flooding from other sources such as overland flow, groundwater, sewers and canals/reservoirs should be addressed as part of a site specific Flood Risk Assessment (FRA). Furthermore the TGNPPF specifies that the potential to increase flood risk elsewhere through the construction of hardstanding and surfaces and the effect this has on surface water runoff should be assessed as part of a FRA.

B.3.48 Therefore in support of this planning application Wardell Armstrong LLP have carried out a FRA and outline surface water drainage strategy in consultation with the EA and TWUL (refer to Appendix B3.1). As required by the TGNPPF the FRA Report (Wardell Armstrong, 2013) reviews other forms of flooding, both historically and in

terms of potential future flooding, within and around the application site. The findings of the FRA show that the risk of flooding to the site from fluvial sources (rivers), groundwater, sewers, artificial sources and surface water runoff (overland flow) is negligible. The proposed development does pose a risk of increased flooding to areas downstream of the site due to increased surface water runoff rates and volumes. As such, a number of mitigation measures have been incorporated into the indicative surface water management plan for the site (refer to Appendix/Drawing WM10671-FRA001 of the Flood Risk Assessment Report).

Value of Receptors

B.3.49 From analysis of the above baseline information, the key water environment receptors within the assessment area, which could potentially be affected by the proposed development either during construction and/or operation are identified in Table B3.5, together with their identified value.

Table B3.5: Summary of identified water environment receptors and their assigned value and proximity to the application site

Receptor	Indicators/features	Value
On-Site Ditch/ Watercourse	Not classified under WFD. Water quality likely to be moderate to poor due to agricultural runoff and designated within NVZ. Receives local surface runoff from a relatively small catchment area. Important for receiving discharges from two private wastewater treatment plants/ septic tanks downstream of the site. Likely to have variable flow and no flow during dry periods. Important for land drainage and reducing local flood risk. Important water source for downstream reservoir, Sor Brook and water dependent ecology.	Low
Sor Brook	Classified under WFD as of good ecological status. Supports abstraction for public potable water supply. Has a small associated floodplain limited to a narrow	High

Receptor	Indicators/features	Value
	corridor along the course of the Sor Brook. Protected area as designated by Fresh Water Fish Directive 2006/44/EC, Drinking Water Directive 98/83/EC and Nitrates Directive 91/676/EEC. Located within designated NVZ. Located within a WRMU classified as 'No Water Available and designated as being highly sensitive to further abstraction.	
Secondary A Aquifer	Forms part of a groundwater body which is classified under WFD as of good chemical and qualitative status. Currently meets DrWPA objectives Provides a baseflow to local watercourses of good water quality. Located within designated NVZ. Located within a WRMU classified as 'No Water Available and designated as being highly sensitive to further abstraction. Supports a number of local licensed water abstractions used for agricultural and domestic purposes. Not located within a GWPZ.	Medium
Water Abstractors	Five licensed water abstractions sourced from ground and surface water used for domestic and agricultural purposes i.e. irrigation and storage.	Medium

Potential Impacts and Significance

B.3.50 The interaction of the proposed development with the baseline conditions of the key receptors has been considered and likely effects predicted in the absence of any mitigation measures. As discussed below, an assessment has been made as to the significance of the likely effects in terms of their nature, extent and magnitude for each stage of the proposed development (site preparation, construction and operation).

B.3.51 The proposed development for the whole site will modify the existing characteristics in two distinct phases:

(i) Short-term impacts related to the actual works and plant operations during the demolition and construction phases of the proposed development of the whole site; and

(ii) Long-term impacts related to the operations of the proposed development of the whole site, in particular the construction of impermeable areas, increased vehicle and anthropogenic use.

Construction Impacts

B.3.52 The construction phase of the proposed development will present the greatest short-term impact on the local aquatic environment in relation to both water quality and quantity (i.e. flood risk).

B.3.53 During construction of the proposed development, pollution from mobilised contaminants and suspended solids is of primary concern, but accidental spillages of fuels, lubricants and hydraulic fluids from the construction plant may lead to pollution incidents especially where there are inadequate mitigation measures.

B.3.54 The activities during construction which pose a risk to water quality include:

- Exposure of bare ground, earth movement, mobilising of sediment into surface water receptors through runoff from the site;
- Wheel washing run-off, or muddy run-off from highways and construction access tracks within the site;
- Pollution due to vandalism of stores or plant;
- Poor/inappropriate storage of materials and chemicals/fuels and wastes such as on permeable surfaces, adjacent to watercourses or without sufficient bunding capacity;
- Accidental spillages of fuels and polluting materials such as concrete;
- Creation of preferential pathways via piling operations, drainage schemes and services corridors; and
- Pumping of silt-laden surface water or groundwater accumulated on the application site or via de-watering directly into controlled waters.

Site Compound

B.3.55 Sediment pollution is the single main pollutant in rainwater runoff from construction sites. Run-off from the site compound, working areas and from activities such as wheel-washing, have the potential to carry silt and other contaminants that may impact on the water quality of the water environment receptors within the application site and downstream to the reservoir and Sor Brook.

B.3.56 The only wastewater generated from construction sites that is not regarded as trade effluent is clean surface water runoff (i.e. from roofs) and clean water from groundwater dewatering.

B.3.57 Poor security of the site compound may lead to the vandalism of plant and materials, which could cause chemical and/or oil pollution. Furthermore poor storage of materials and fuel could lead to leaks or accidental spillages and potentially adversely impact on water quality.

B.3.58 Any areas of exposed ground and stockpiles of granular or soluble material could result in the introduction of fine sediment and chemicals into the watercourses on the site during periods of heavy rain if they are not properly maintained and contained. Any deterioration in surface water quality has an associated potential for impact upon the local ecology in the area and this is discussed in further detail in Chapter B7.

B.3.59 Without mitigation the risk of a pollution event occurring is considered to be high. The magnitude of the impact upon water quality will depend upon the location, quantities of sediment or contaminants released and the flows within the receiving watercourses at the time.

B.3.60 As a worst case, without mitigation the magnitude of this potential impact is anticipated to be high adverse for receptors of low value. Therefore the significance of the impact upon water quality during construction, without mitigation, is anticipated to have a **moderate adverse significant effect** upon the ditch/minor watercourse and downstream water abstraction users. Such an impact should however not affect the Sor Brook as the reservoir will sufficiently slow flows to allow any suspended sediment to settle out before reaching the brook.

Flood Risk

B.3.61 Impacts upon water quantity and flood risk can occur during the construction phase, particularly during the earth movement stage of construction works where large depressions or a bund effect can occur. In such circumstances where intense rainfall can cause pluvial flooding (rainfall that cannot drain away fast enough from the surface) the ponding of water may occur on the surface. As the land is currently predominantly in agricultural use this will provide some reduction in overland flows, however with crop cover/vegetation removed as part of the initial site clearance topsoil and subsoil will be exposed and water logging and ponding may occur more frequently.

B.3.62 During the more severe rainfall events overland flow is likely to occur in greater quantities and more frequently as it will be unrestricted and is likely to lead to increased quantities of flow entering the ditch/minor watercourse within the site. This may lead to a potential reduction in the ditches' conveyance capacity, potentially resulting in localised flooding within the site, to adjacent properties and highway infrastructure.

B.3.63 The magnitude of this impact is anticipated to be major on the local ditch course and adjacent properties and highways resulting in a **major adverse significant effect**. However, it will be in the contractors own interests to phase development appropriately and manage site drainage to minimise the flooding of working areas and a requirement for them to prevent any increase in risk to downstream property.

Dewatering Operations, Over-Pumping and Excavations

B.3.64 The depth of groundwater at the application site has not been investigated and is therefore unknown. However if excavations do occur below the water table then dewatering may be required which has the potential to reduce the water available for abstraction and the provision of base flows to local watercourses and abstractors. Contamination of groundwater may also occur from leaking submersible pumps and construction vehicles. A shallow water table if present could potentially provide a preferential pathway to the Secondary A aquifer in addition to associated surface water features. As such the creation of source-receptor pathways through dewatering activities causing the potential for long term contamination of the underlying groundwater body to establish would have a major adverse impact on

resources of medium value/sensitivity depending on the extent of the pollution incident. Any deterioration in water quality and availability may have an associated impact on aquatic ecology and human health. As such this would result in a **moderate adverse significant effect** prior to mitigation.

Earthworks and Ground Remodelling

B.3.65 The movement of earth and excavation at the application site could potentially affect the hydrogeology of the underlying bedrock and Secondary A aquifer, in addition to the hydraulic continuity between ground and surface water receptors and the water supply to local groundwater abstractors. If high levels of groundwater are present at the application site, major ground reprofiling may result in groundwater flows being interrupted causing localised flooding and low levels elsewhere. This also applies to the construction of uninterrupted foundations which can act as a physical barrier to the conveyance of groundwater. The magnitude of this impact may be adversely moderate on resources which are considered to be of medium sensitivity/importance. The significance of the potential effect is therefore of moderately adverse significance.

Operational Impacts

B.3.66 Operational impacts are those which will occur following the completion of the development. Often it is difficult to quantify the magnitude of long term impacts due to the timescales over which they may occur and the resilience of the environment to adapt to future changes, therefore professional judgement is used to undertake the assessment. During operation of the scheme there are potential for impacts upon both water quality and water quantity (flood risk). The nature and extent of the impacts are explained below and an assessment is made of the significance of the potential impacts.

Water Quality

B.3.67 Preferential pathways for the movement of potential contaminants and pollutants may be created as a result of changes in the drainage regime of the application site. New sources, or the increased significance of existing sources of potential contaminants, may also occur and may include:

- Sediment within surface water runoff;

- Contaminants from vehicle movements within the site (i.e. pollutants within the runoff from hard standing areas such as roads and parking areas);
- Accidental spillages; and
- Discharge of wastes, chemicals or foul water to surface water sewer drains or ground.

B.3.68 There is a potential for these contaminants to enter the proposed installed surface water drainage system which will discharge to the SuDS features within the site, to the receiving watercourse/ ditch system and ultimately to the Sor Brook. Over time this could have the potential to degrade the surface water receptors. It is therefore considered that there is a potential for an adverse impact without mitigation at a local level. The magnitude of this adverse impact would be minor on the local ditch, resulting in a **minor significant effect.** However the long term derogation in local water quality would have a major impact on downstream surface water abstractors. These receptors are classified as being of medium value, which would result in a **moderate adverse significant effect** without mitigation.

Change in Land Use

B.3.69 The current land use of the site is agriculture which is the predominant source of nutrients such as phosphates and nitrates. Nutrients can lead to deterioration in water quality of either receiving watercourses or groundwater bodies and this is evident on through the NVZ designation in this area, under the Nitrates Directive from 2013. The removal of the application site from agricultural production will reduce the level of agricultural chemicals discharged into the ditch/minor watercourse. This reduction in nutrient and pesticide input will have a moderate beneficial impact on the local ditch/watercourse system resulting in a **minor beneficial significant effect**. This beneficial impact is likely to be negligible for the Sor Brook due to the size of its contributing catchment and surrounding agricultural land use.

Water Availability

B.3.70 The proposed mixed use development could potentially significantly increase pressure on local water resources classed as being highly sensitive to abstraction and located within an area classified as 'No Water Available' by the EA. This is based on the assumption however that the development will be supplied by water locally,

such as the Sor Brook. An increase in water abstracted from such resources will have a major adverse impact on resources of high value such as the Sor Brook) resulting in an effect of **major adverse significant effect.** However if Thames Water have planned for the future growth of Banbury and have improved the water supply and storage infrastructure to cater for future requirement, then the impact of the proposed development on resource of high value will be negligible. This would result in an effect of **no significance.**

Sewerage Infrastructure

B.3.71 The proposed development is of significant size in relation to the Banbury catchment and will generate a considerable proportion of foul flow which will be discharged to the local public sewerage system. TWUL has confirmed that an Impact Study will be required as the development will produce a significant load on the small local network (Appendix 4 of the FRA Report (Wardell Armstrong LLP, 2012). The results of the Impact Study are not yet available but it is anticipated that off site improvement works to the public sewerage system will be required to cater for the additional foul flows and ensure that there is no adverse impact in terms of sewer flooding and on the quality of local watercourses receiving final effluent and combined sewer overflow spills. If offsite improvement works are carried out before the development is connected and operational then the impact on the receiving public sewerage network should be negligible on receptors of potentially major value (such as the River Sor, River Cherwell and humans), resulting in a minor adverse significant effect.

Physical Impacts on Existing Water Features

B.3.72 It is proposed that the existing drainage ditch along the southern boundary of the site is incorporated into the sustainable surface water drainage of the development. Proposals include for the ditch to be extended and enhanced to improve the water quality of surface water runoff, dependent local ecology and flood risk to neighbouring land. The enhancement of this feature will have a moderate beneficial impact on a receptor of low value. As such the effect will be on minor beneficial significance.

B.3.73 Table B3.6 below provides a summary of the impact assessment on the water environment prior to mitigation.

Table B3.6 Summary of impact assessment upon water environment receptors

Description of impact	Geographical level of importance of issue					Impact Beneficial / Adverse	Nature St / Lt / R / IR	Significance Major / minor / negligible
	I	N	R	D	L			
Sediment pollution from construction activities					✓	Adverse	St, IR	Moderate
Release of contaminating materials during construction					✓	Adverse	St, IR	Moderate
Increased overland flow increasing flood risk within the site during construction					✓	Adverse	St, R	Major
Polluting materials from the development (i.e. vehicles movements etc)					✓	Adverse	Lt, R	Moderate
Decreased input of nutrients as land no longer used for agriculture					✓	Beneficial	Lt, R	Minor
Creation of Preferential pathways and derogation of water quality					✓	Adverse	Lt, R	Moderate
Increased loading of foul flows on public sewerage system				✓		Adverse	Lt, R	Minor
Increase				✓		Adverse	Lt, IR	Major

Description of impact	Geographical level of importance of issue					Impact Beneficial / Adverse	Nature St / Lt / R / IR	Significance Major / minor / negligible
	I	N	R	D	L			
pressure on limited water resource if sourced locally								
Extension and enhancement of new ditch/watercourse/Swale					✓	Beneficial	Lt, R	Minor

Key: I = International. N = National. R = Regional. D = District. L = Local.

St = Short term. Lt = Long Term. R = Reversible. IR = Irreversible.

Mitigation Measures

Construction Phase

B.3.74 To protect water quality during construction, the Construction Environmental Management Plan (CEMP) will incorporate the water pollution prevention measures set out in the Environment Agency's Pollution Prevention Guidelines (PPG) and will set out an emergency response plan in the case of a pollution incident. The guidelines relating to the proposed development include:

- EA PPG01: General guide to the prevention of pollution;
- EA PPG02: Above ground oil storage tanks;
- EA PPG03: The use and design of oil separators; surface water drainage systems;
- EA PPG05: Works and maintenance in or near water;
- EA PPG06: Working at construction and demolition sites;
- EA PPG08: Safe storage and disposal of used oil;
- EA PPG13: Vehicle washing and cleaning;
- EA PPG18: Managing firewater and major spillages;
- EA PPG20: Dewatering underground ducts and chambers;
- EA PPG21: Pollution incident and response planning;
- EA PPG22: Incident response- dealing with spills;
- EA PPG26: Drums and intermediate bulk containers (containing oil, chemicals or potentially polluting substances).

B.3.75 This list of guidelines is not exhaustive and the CEMP will also accord with the CIRIA guidance documents, including 'Report 156: Control of water pollution from construction sites – a guide to good practice', which provides additional detail on reducing the impact of construction works on the water environment. Other relevant CIRIA reports include C522, C523 and C532.

B.3.76 The CEMP will define the pollution prevention methods for preventing entry of contaminants into water bodies.

B.3.77 The following mitigation measures will also be addressed as part of the CEMP and construction contract documents to ensure that good practice is adopted:

- High risk activities will be undertaken away from sensitive receptors (i.e. watercourses and connections to surface water sewers), where practicable (e.g. re-fuelling area). Any drainage within a refuelling area will incorporate an isolation facility such that the outlet could be sealed in the event of a spill;
- An emergency spillage response plan will be produced, including location and types of spill kits and will also provide a full list of protocols and communications channels with the Environment Agency in the event of an accidental pollution incident;
- Appropriate equipment such as booms and absorption mats will be made available and easily accessible for the event of an accidental spillage or pollution incident;
- Site signage will be erected showing who to contact in the event of a spillage or emergency;
- Monitoring of works areas to identify spills or possible leaks will be undertaken daily;
- Bunded compounds for storage of fuel, refuelling and handling of chemicals will comply with current regulations for the safe storage of fuels, lubricants and other chemicals and will be sited to prevent leakage;
- All plant used during the works will be of modern design, clean, inspected as suitable for use before delivery and use on site, inspected daily for leaks and damage, and stored overnight in fuelling areas away from excavations or drainage;

- Drip trays will be used beneath all static plant or semi-static plant to prevent leakage and these will be checked daily and emptied of rainwater as hazardous waste;
- All construction-phase routine maintenance of vehicles and machinery will be conducted off site and operational-phase maintenance work will be conducted in areas designed to prevent the pollution of surface waters;
- There will be appropriate designation of site parking and delivery waiting areas to minimise the potential for contamination of receiving surface waters by uncontrolled releases (i.e. leaks and drips);
- There will be protocols for vehicle washing activities and wash water management;
- The site will be appropriately secured and monitored to prevent vandalism;
- Development of an erosion and sediment control plan, or drain isolation, will consider the management of stock piles to limit runoff and potential pollution and minimise the movement of materials around the construction site (i.e. minimise double-handling);
- Any de-watering works will be appropriately managed to prevent entry of contaminants into surface waters and surface water sewers and any de-watered waters will be appropriately handled and disposed of. Sediment-laden waters will be pre-treated (settled) to remove suspended sediment prior to discharge. Pumped water will be disposed of to grassed land or into an infiltration/settlement basin. Offline settling tanks or settling basin may need to be installed for some of the works; and
- Any temporary discharges to ordinary watercourse or sewer will be appropriately consented and approved by the Lead Local Flood Authority or the sewerage undertaker. Water will be pump-returned to the watercourse at a slow rate or the energy of water dissipated to avoid disturbing and eroding the channel bed.

B.3.78 It is likely that the development will be progressed in phases and it will be important to ensure that construction activities do not impact upon SuDS constructed required for the operational phase of the development. This will require management within the site by the contractor of surface water runoff from construction areas.

Residual Impacts

Construction

B.3.79 All short term impacts identified will be mitigated by adhering to the CEMP and providing an interim sustainable drainage system. This will ensure that there will be **no significant adverse effect** in terms of water quality and quantity during the construction phase provided that all mitigation measures as described above are implemented and adhered to.

Operation

Flood Risk and Surface Water Drainage

B.3.80 The application site is currently Greenfield, which allows most rainfall to naturally permeate and soak through the ground and recharge the underlying aquifer. The primary impact of the development during operation will be to change this relationship within the application site. Surface water runoff will be generated at both an increased rate and volume than occurs at present due to an increase in the area of impermeable surface within the application site. This would result in a major adverse impact in terms of surface water flooding to adjacent land users and properties and to end users of the site itself, receptors of high value. The effect of this impact would therefore be of **major adverse significant effect** without mitigation measures being in place.

Drainage Strategy – Surface Water & Sustainable Drainage Systems

B.3.81 Surface water runoff from the developed site will be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing flood risk and taking climate change into account.

B.3.82 It is a planning requirement to promote and use SuDS where possible as outlined in the NPPF and the CIRIA C697 'SuDS Manual' (2007). These systems are diverse, but generally aim to provide drainage systems that facilitate flood and pollution control related to surface water runoff. In the first instance it is proposed that surface water runoff from the development is drained and discharged to ground using infiltration SuDS techniques. This is dependent on ground conditions however which will be established during the detailed design stage. If ground conditions are not conducive to a soakaway system then surface water runoff will be discharged to a nearly local

watercourse at a runoff rate equivalent to pre-development runoff rate and to a public surface water sewer at a rate to be agreed with TWUL.

B.3.83 The FRA report included in Appendix B.3.1 details which SuDS systems will be considered for each type of development area within the application site to ensure that the space required for these features is provided for as part of the masterplan and the appropriate level of treatment stages is achieved. The use of SuDS within the site will lead to a reduction in peak flows and as a result flood risk, in addition to enhancing the settlement and biodegradation of pollutants, and an improvement in water quality treatment. Where the outflow is released to surface waters the reduced peak flow causes less of a short term pollutant load to the receiving waters and allows increased dilution.

B.3.84 The existing minor ditch within the site is to be incorporated and improved within the proposed site layout. This alongside the creation of the proposed retention pond, which are likely to be permanently wet, will provide new surface water features which will be of benefit to the water environment. If the new/ improved sections of watercourse and pond are designed to include measures for water quality improvements, such as the inclusion of two-stage channels and meanders as well as marginal planting, this will have additional benefits for the water environment (and also other receptors such as ecology and landscape).

B.3.85 Under the development proposals the land designated for public open space (sports pitches) in the eastern part of the site will be raised slightly. It is understood that the land will be raised by up to 600mm (variable across the site) using soil from other areas of the site. The soils will incorporate drainage where appropriate to ensure that an adequate playing surface on the sports pitches is provided. It is considered that surface water runoff rates will be unaltered since there is unlikely to be any change in the permeability of the land.

B.3.86 To ensure that surface water does not run off site and cause flooding to neighbouring properties as a result of the land raising, mitigation measures such as cut-off ditches to intercept runoff will be incorporated within the public open space.

B.3.87 By implementing these design measures within the site, impacts of the development on water quality, drainage and flood risk during operation will be negligible providing that they are maintained appropriately.

B.3.88 Design considerations (i.e. the incorporation of SuDS) and regulatory mechanisms to control peak water levels and runoff rates will ensure that there is no increased risk of flooding resulting from the development. It is predicted that there will be **no significant adverse residual effect** upon water quality and water quantity during operation provided that the SuDS systems are appropriately designed and maintained.

Water Resources & Availability

B.3.89 To partly mitigate the potential impact on local water resources and dependent ecology, the development will follow the water conservation hierarchy – avoid, reduce, recycle and disposal. This will be achieved through the construction of Level 3 category homes (i.e. 105 litres/person/day) for the Code of Sustainable Homes (CSH).

Preferential Pathways

B.3.90 The prevention or mitigation of the creation of preferential pathways is difficult to achieve as this is an inevitable persistent long term impact associated with any urban development and long term anthropogenic use. Mitigation of this impact may be offered in the form of increasing public awareness of potential domestic pollution sources and changing and improving public behaviour. However such changes in public behaviour and culture are often difficult to introduce and slow to take effect unless some form of enforcement or penalty system is introduced. This impact however could be further mitigated for by ensuring the development incorporates a three stage SuDS treatment train as a minimum before surface water is discharged off site. If such mitigation measures are employed as part of the development then the resulting **residual effect will be negligible**.

Cumulative Impacts

B.3.91 The following section assesses the cumulative effects of a number of Assessment Sites which are presumed to go ahead and for which sufficient information is

available. The cumulative schemes that have been considered are identified in Section A.

B.3.92 The development of these schemes in addition to the proposed development will primarily result in two cumulative effects relating to pressures on both water supply and the capacity of the sewerage infrastructure.

Water Resources and Supply

B.3.93 These combined developments will have a significant cumulative effect on the local water supply infrastructure and regional water resources (depending on how Thames Water currently source potable water to the Banbury catchment). It is assumed that Banbury is mostly supplied by water abstracted from surface water, such as the River Sor, as there are no GSPZ within an 18km radius of Wykham. If these proposed developments are supplied from a similar or the same water source, then this would introduce a significant additional pressure on water resources already classified as 'no water available' and highly sensitive to further abstraction. Therefore in the worst case scenario and based on a number of assumptions this would result in an **adverse cumulative effect of major significance.**

B.3.94 However it is anticipated that Thames Water have strategically planned for future growth of Banbury and as such will have improved the local water supply and storage infrastructure in addition to using alternative water sources, such as catchment transfer, to ensure that the future supply/demand balance for potable water is sustainably met. Based on this assumption it can be concluded that the combined developments will have a **negligible cumulative significant effect.**

Sewerage Infrastructure

B.3.95 The second cumulative effect will involve the impact of these combined developments on the receiving public sewerage network and its capacity. TWUL has been commissioned to undertake an Impact Study as they have confirmed that the development will place a significant load on the relatively small public sewerage network serving Banbury. The results of this study are not yet available. However the foul loading generated from the proposed development in combination with the other developments listed in Section A, in addition to windfall developments, may reduce the capacity of the sewerage system. The Impact Study by Thames Water

will provide a foul loading figure but this was not available at the time this ES was submitted.

B.3.96 Potentially this can cause foul flooding, exacerbate existing flooding problems and impact on the water quality of local watercourses from combined sewer overflows and insufficient treatment capacity at the sewage treatment works. This is based on the assumption however that Thames Water have not strategically planned for additional growth in and around the Banbury catchment, achieved through the capital investment in sewerage infrastructure, which is considered to be unlikely.

B.3.97 However it has not been confirmed whether Thames Water have programmed such capital works (if required) to be complete before all three proposed developments are completed and are on line. Therefore the full impact and cumulative effect that these proposed developments will have on the receiving sewerage system cannot be fully appreciated. If Thames Water has programmed improvement works before the proposed developments come on line and there is sufficient capacity in the receiving sewers then there should be a minor adverse **significant cumulative effect.** In terms of the worse case scenario however then there is potential for an **adverse cumulative effect of major significance.**

Conclusions

B.3.98 All potential impacts on water environment receptors have been highlighted in this chapter and mitigated for, through the incorporation of SuDS techniques and ensuring that best practice techniques are employed as part of the design process. The assessment has concluded that providing the recommended mitigation measures are adopted during the construction and operation of the Wykham Park Farm Development and Thames Water has provided the necessary infrastructure required to service the development sustainably, then there should only be a minor adverse significant impact on the water environment. This is attributable to the secondary impact the development will have on high value receptors such as the Sor Brook and River Cherwell, due to the additional loadings on the public sewerage system.

Summary

B.3.99 Sor Brook is located 500m south of the southern site boundary. A tributary of the Brook flows from within the centre of the proposed development site, east toward Wykham Farm and then turns south to confluence with the Sor Brook approximately 500m off the south-eastern corner of the site. The Sor Brook is designated as Main River and is regulated by the Environment Agency (EA) . The section of drainage ditch within the site is anticipated to be unclassified but enforced by the Lead Local Flood Authority (LLFA) under the Land Drainage Act.

B.3.100 The Sor Brook has a regionally important potable water supply abstraction point on it at Adderbury and more locally registered abstractions for agricultural (spray irrigation) use and is therefore highly valued. There is also a consented Thames Water sewage discharge consented on Broughton Road within near vicinity of the site. The drainage ditch has no significant abstraction or discharge associated with it, with only a few minor domestic final effluent discharges associated with it. The watercourse within the site is not classified under the WFD. Water quality is likely to be typical of small watercourses receiving agricultural runoff.

B.3.101 During construction impacts may result from the release of sediment into the watercourses or the use of polluting materials on site such as cement and fuels. With appropriate mitigation and best practices employed during construction there is anticipated to be no significant effect upon any surface or groundwater.

B.3.102 The incorporation of SuDS techniques as part of the design process ensures that impacts during operation on flood risk and water quality from the development are reduced to an acceptable level, assuming these are maintained appropriately. The enhancement of the ditch and the application of the SuDS treatment train within the development means that there will be a net increase in open water across the site. The potential increase in downstream flood risk associated with the increase in impermeable surfaces associated with the development of the site is to be mitigated through the control of surface water runoff from the site to pre-development rates and through the use of on-site SuDS, including the use of swales and ponds/retention basins. This creates new water features within the environment and is a beneficial impact not only in terms of flood risk and water quality but also for ecological diversity.

B.3.103 The operation of the proposed mixed use development could significantly increase pressure on local water resources classed as being highly sensitive to abstraction and 'No Water Available' which would result in a major adverse significant effect. However this is based on the assumption that the development will be supplied by water locally. If Thames Water have planned for the future growth of Banbury and have improved the water supply and storage infrastructure to cater for future development, then the impact of the proposed development should be negligible, resulting in an effect of no significance.

B.3.104 Likewise the operation of the proposed development will place a significant loading on the comparatively small public sewerage system serving the Banbury catchment. At the time of writing this report TWUL is carrying out an Impact Study to determine if the sewerage system has sufficient capacity to receive the additional foul loadings and identify areas that will require upgrading. If off site improvement works to the public sewerage system are necessary then providing these are completed ahead of the development coming online, there should be a negligible adverse impact in terms of sewer flooding and on the quality of local watercourses (such as the Sor Brook and River Cherwell) receiving final effluent and combined sewer overflow spills. However as the Sor Brook is of major value then the resulting effect will be of minor adverse significance.

B.3.105 The assessment has concluded therefore that providing the recommended mitigation measures are adopted during the construction and operation of the proposed Wykham Park Farm development, there should be an adverse effect of minor significance on the water environment due to the negligible impact of the sewerage infrastructure on a receptor of major value).

B.4 TRAFFIC AND ACCESS

Introduction

B.4.1 This chapter of the ES has been prepared by SBA and assesses the likely significant effects of the Project in terms of traffic, public transport, cycling and pedestrians. The data and analysis discussed in this chapter is taken from the Transport Assessment (TA) and Travel Plan (TP) which have been submitted as supporting documents with this planning application.

B.4.2 This chapter also describes the methods used to assess the effects, the baseline conditions currently existing at the Application Site and surroundings, the mitigation methods required to prevent, reduce or offset any significant adverse effects, and the residual effects after these measures have been employed.

Methodology

B.4.3 The TA has been produced in line with guidance contained within Guidance on Transport Assessment published by the Department for Transport (DfT) in March 2007 which widened the assessment criteria to address the assessment of the potential implications of development proposals on the entire transport system, including the public transport system (buses, rail and trams) the Strategic Road Network (SRN), local highways, cycleways and footways.

B.4.4 The TP has been prepared in line with the DfT guidance on origin destination travel plans – Delivering Travel Plans through the Planning Process, April 2009.

B.4.5 In summary, the scope of the TA includes:

- An assessment of the transport planning policies related to the Project;
- An assessment of the existing transport conditions in the area including public transport, the pedestrian network, the cycle network and the highway network;
- An assessment of the predicted trip generation of the Project (the TA is based upon a maximum figure of 1100 new dwellings and 5000m^2 of employment uses);
- An assessment of the transport network's ability to cope with the predicted trips; and
- A proposed transport strategy to reduce the need to travel, maximise

accessibility and encourage trips to and from the Project by modes other than the private car.

B.4.6 Traffic data submitted in the Transport Assessment supporting a submitted planning application at OS Parcel 5700 South of Salt Way at Crouch Farm Bloxham Road Banbury Oxfordshire has been used. These surveys were carried out by PCC Traffic Information Consultancy on Thursday 6th October 2011 at the following junctions:

- Bloxham Road / Springfield Avenue
- Bloxham Road / Queensway
- Bloxham Road / Oxford Road
- Oxford Road / Upper Windsor Street
- Oxford Road / Horton View / Hightown Road
- Oxford Road / Farmfield Road
- Oxford Road / Grange Road

B.4.7 A traffic survey of the Bloxham Road / Wykham Lane junction was carried out by Axiom Traffic Limited on Thursday 20th September 2012.

B.4.8 Amended local growth rates, using TEMPRO and NRTF factors have been applied to assess the impact of the Project in 2017 and 2022. The growth factors are calculated using future local population, dwelling and employment forecasts for the local area and are therefore deemed to take into account committed development within the impact area.

B.4.9 Total person trip generation rates for the residential development have been derived from the TRICS database and vehicle trips allocated by applying the modal split for the Banbury Easington Ward as recorded in the 2001 Method of Journey to Work Census Data.

B.4.10 Total person trip generation for the employment development have been derived from the TRICS database and vehicle trips allocated by reversing the modal split for the Banbury Easington ward as recorded in the 2001 Method of Journey to Work Census Data.

B.4.11 The primary school and retail elements of the scheme will not attract trips from outside of the development and therefore all vehicle trips to these elements will either be wholly internal or as part of a linked trip which will have been counted within the housing trip rate calculation.

B.4.12 In order to distribute the predicted residential trips associated with the Project on to the highway network existing travel patterns were used, evidence of existing travel patterns were derived from the 2001 Census. The distribution for the residential development was then reversed to produce a distribution for the employment development.

B.4.13 Following these calculations the local transport network was tested in order to assess the impact of the Project.

Planning Context

National Policy

B.4.14 The key documents in terms of national policy are 'The Future of Transport: a network for 2030' and the National Planning Policy Framework.

The Future of Transport: a network for 2030

B.4.15 The UK Transport White Paper, 'The Future of Transport: a network for 2030' was adopted in 2004. This sets out a strategy to address the challenges to be faced by the transport system over the next 20 to 30 years as demand for travel continues to increase. This strategy seeks to balance the need to travel with environmental objectives by better managing travel demand and providing better information and choices on how organisations and individuals undertake their journeys.

B.4.16 The proposals attempt to minimise the need to travel by locating residential the Project within an acceptable walking and cycling distance of everyday facilities and services, including schools, shops and health care, and public transport services. The provision of a primary school and a local centre will internalise a proportion of trips, minimising the impact of the development on the local highway. The TP will promote sustainable modes of travel and inform future residents of the transport options available to them.

National Planning Policy Framework

B.4.17 The National Planning Policy Framework (NPPF) was published on 27 March 2012 and sets out the Government's planning policies for England. It is focused on economic growth and sustainable development. The NPPF states that there is "a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan making and decision-taking".

B.4.18 With specific regard to the integration of transport and land-use planning, the overarching principles promoted within the NPPF are consistent with those previously promoted within PPG13. The NPPF states that planning should "actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable".

B.4.19 The NPPF also states "Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe".

B.4.20 The provision of high quality pedestrian and cycling facilities within the site, along with the provision of a new pedestrian / cycle link along Bloxham Road will connect directly to the existing pedestrian and cycling network and will encourage residents to undertake journeys on foot and by bicycle whenever possible. The signalisation of the existing Bloxham Road / Queensway junction will enhance pedestrian crossing facilities of Bloxham Road and Queensway.

B.4.21 The proximity of the Project to Banbury's Town Centre and facilities and services provided within the proximity of the site, which are all within 5km of the site, ensures walking and cycling provides a realistic modal choice for future residents travelling to and from the site.

B.4.22 The diversion of a local bus service into the site ensures that all future residents will be within 400 metres of a bus service.

B.4.23 Banbury railway station is within 5km of the site enabling future residents access to rail services by a linked trip undertaken by bicycle or by bus.

Regional Policy

B.4.24 The key document in terms of regional policy is the Regional Spatial Strategy for the South East of England.

B.4.25 The RSS for South East England, or the 'South East Plan' (SEP), currently provides the spatial framework that forms the context within which Local Development Documents and Local Transport Plans need to be prepared, as well as other sub-regional strategies, programs that have a bearing on land-use activities. The SEP is currently in place but is due to be revoked.

B.4.26 The South East Plan provides policies on the housing requirements for the region, and the way in which it is to be delivered. Specifically paragraph 1.2 of Section D3 Housing seeks to:

'*ensure that adequate levels of housing provision are delivered in the form of high quality; housing with sustainable communities*'.

B.4.27 Policy H3 on the location of housing states that new housing, '*should be in sustainable locations which have the necessary infrastructure, services and community provision, or where this provision is planned. Housing developments should generally be in locations that are, or can be, well served by a choice of transport modes, with higher densities in the near locations well-served by public transport'*.

B.4.28 The Regional Transport Strategy (RTS) published by the Secretary of State in July 2004 forms the basis of draft transport policies for the South East Plan. The regional Transport Strategy represents a replacement of the transport chapter of Regional Planning Guidance for the South East (RPG9), published in March 2001 and is included as part of the Regional Spatial Strategy for the South East.

B.4.29 The Regional Transport Strategy (RTS), attains to support sustainable development patterns through policies that include:

- Minimising the need for travel;
- Travel Plans for major travel generating activities and travel awareness strategy;

- Parking policies, including maximum car parking standards for new developments; and
- Promoting walking, cycling and public transport.

B.4.30 The key components within the RTS are to ensure that sites selected for developments that generate a large number of transport movements should be located at or close to sites where it will help reduce the number and length of journeys to work, shops, leisure and recreation, education and other public facilities, especially by car. Essentially the site should provide, or have the potential to provide, ready and convenient access on foot, by cycle and public transport to achieve a measurable modal shift in favour of non-car modes of travel.

B.4.31 The sustainable nature of the Project with the provision of a primary school and a local centre and in close proximity to secondary schools, Banbury town centre and employment uses promotes travel by the future users of the site by sustainable travel.

Local Policy

Oxfordshire County Council Local Transport Plan III – 2011-2030

B.4.32 The current Local Transport Plan was published in April 2011 and will run until 2030. The third edition of the plan runs for a longer period and supersedes the earlier versions, LTP I – (2001-2006) and LTP II – (2006-2011).

B.4.33 LTP III sets out the following Local Transport Goals:

- ensure new developments are designed to promote permeability on foot both within the site and to link with the existing settlement;
- ensure new developments are designed to promote permeability by bike both within new sites and to link them with the existing settlement;
- ensure that new developments are located and designed to encourage the use of the bus, with particular attention to minimising walking distances to bus stops on the strategic routes;
- ensure developers of new sites in Banbury undertake detailed Transport Assessments and implement travel plans for the residents, employees and users of their sites;
- to make the best use of existing road space through appropriate traffic

management measures, vehicle routing and use of technology;

- to make local improvements to junctions and roads within the town to help reduce delays and traffic congestion.

B.4.34 The LTP also covers the main emerging infrastructure schemes and strategic transport schemes that are required in Oxfordshire during the LTP 3 period up to 2030. The following scheme is directly relevant to the proposed site:

- highway improvements to increase capacity in Banbury on the A4260 Windsor Street and Oxford Road north/south route, in conjunction with improvement on the A361 South Bar route.

B.4.35 The project provides pedestrian and cycle facilities within the site and links with Banbury's existing pedestrian and cycling network and will provide future residents to use these modes of transport.

B.4.36 The diversion of a local bus service into the site ensures that future residents will be within walking distance of bus services and encourage the use of public transport.

B.4.37 A detailed TA and TP have been submitted with the planning application.

B.4.38 Local improvements to the Oxford Road network and the Bloxham Road / Queensway junction will help delays and congestion.

Cherwell District Council Local Development Framework (LDF)

B.4.39 Cherwell district Council is preparing its LDF which will replace the Cherwell Local Plan (1996).

Cherwell District Council Draft Core strategy

B.4.40 Cherwell Council is in the process of preparing the Core Strategy for the district. A Draft Core Strategy was published by the District Council in 2010. A relevant objective from the document is:

'*SO12 – To reduce the dependency on the private car as a model of travel, increase the attraction of and opportunities for travelling by public transport,*

cycle and on foot, and to ensure high standards of accessibility for people with impaired mobility.'

B.4.41 The proposed development site is identified within the Core Strategy as part of a larger area as an option for a major urban extension for Banbury.

B.4.42 The Project through the provision of footways / cycleways linked to the existing network and the diversion of a local bus service along with a TP increases the opportunities for future residents to undertake journeys by alternative modes to the private car.

Cherwell District Council Non-Statutory Cherwell Local Plan (NSCLP)

B.4.43 The NSCLP was approved in 2011 as interim planning policy for development control purposes until its replacement by the LDF.

B.4.44 Relevant transport policies in the NSCLP include:

- TR3 – A Transport Assessment and Travel Plan must accompany development proposals likely to generate significant levels of traffic;
- TR4 – Before proposals for development are permitted the Council will need to be satisfied that all appropriate mitigation measures required to support that development are identified within an implementation programme. Such measures will include highway improvements, traffic management measures, improved public transport and / or facilities, and measures to improve pedestrian and cycle accessibility;
- TR9 – All new development shall provide cycle parking to Oxfordshire County Council standards;
- TR11 – Development likely to attract vehicular traffic will be required to:
  (i) Accommodate within the site the necessary highway safety requirements relating to access, turning and servicing;
  (ii) Include appropriate measures to minimise the visual impact of vehicles and parking areas;
  (iii) Comply with maximum standards for car parking;
  (iv) Provide parking for people with disabilities in accordance with the Council's standards;
  (v) Provide cycle parking in accordance with the Council's standards.

B.4.45 The Project meets the requirements of the NSCLP.

Baseline Conditions

Highway Network

B.4.46 Bloxham Road (A361) is approximately 7.0 metres wide in the proximity of the site and is a single carriageway subject to a 60mph speed limit. Further north, on entry to Banbury's built-up area the speed limit changes to 30mph. Bloxham Road is a key strategic link from Banbury to Bloxham 2.5km to the south-west and Chipping Norton 17km to the south-west.

B.4.47 Queensway is an urban dual carriageway subject to a 30mph speed limit which provides access to the north-west of Banbury and also to the M40 via Ruscote Avenue and Hennef Way.

B.4.48 Oxford Road (A4260) provides a key strategic link into the centre of Banbury for the south eastern housing areas and villages to the south of Banbury.

B.4.49 South Bar Street (A361) is a continuation of Oxford Road and heads towards the main centre. Continuing along Horsefair and Southam Road provides access to Hennef Way and the M40.

B.4.50 Upper Windsor Street (A4260) provides an alternative access to the main centre, skirting Banbury's eastern side, and also the railway station and the M40.

B.4.51 Wykham Lane is rural in nature. Wykham Lane links Bloxham Road and Oxford Road.

B.4.52 The Bloxham Road / Wykham Lane junction takes the form of a priority crossroads with Bloxham Road forming the major through road.

B.4.53 The Bloxham Road / Queensway junction takes the form of a priority junction with right-turners from Bloxham Road provided with a large ghost right turn lane.

B.4.54 The Bloxham Road / Springfield Avenue junction takes the form of a priority junction with right-turners from Bloxham Road provided with a large ghost right turn lane.

B.4.55 The South Bar Street / Oxford Road / Bloxham Road junction is a signalised junction with pedestrian facilities operating on the northern arm (South Bar Street). From the north South Bar Street flares from a single lane to two allowing a separate straight ahead, to Oxford Road, and a right turn movement to Bloxham Road. Bloxham Road from the south is a single lane approach. The final arm, Bloxham Road, approaching from the west, flares from a single lane to two lanes with a separate right turn onto Oxford Road and a left filter onto South Bar Street.

B.4.56 The Oxford Road / Upper Windsor Street junction is a three arm signalised junction with Oxford Road making up the north and south approaches and Upper Windsor Street approaching from the east. The Oxford Road North arm has a two lane approach which flares from a single lane from the junction of Old Par Road (approximately 100m north) to provide separate lanes for left and straight ahead movements. The Oxford Road South arm also has a two lane approach which flares from a single lane to provide a straight ahead and right turn movement. Finally, the Upper Windsor Street arm also flares from a single lane to provide a two lane approach with separate allocation for left and right turners.

B.4.57 The Horton View / Oxford Road / Hospital Access junction takes the form of a four arm signalised junction with Horton View making up the west arm and the hospital access the eastern arm. The Oxford Road North arm flares from one lane to two with the inside lane for left turn and straight ahead movements and the outside lane for right turn and straight ahead movements. The Oxford Road South arm is a two lane approach with the inside lane for left turn and straight ahead movements and the outside lane for right turn and straight ahead movements. Horton view has a single lane approach which allows for all movements and the hospital access is a single lane exit only arm.

B.4.58 The Hightown Road / Oxford Road junction is a three arm signalised junction with Oxford Road making up the north and south arms and Hightown Road approaching from the east. From the north Oxford Road has a two lane approach with both lanes allowing straight ahead movements and the inside lane also providing for left turners. The Oxford Road South arm flares from a wide single lane to a two lane approach with both lanes allowing straight ahead movements and the outside lane

also providing for right turners. Finally the Hightown Road has a single lane approach which allows all movements.

B.4.59 The Farmfield Road / Oxford Road junction is a four arm signalised junction with Farmfield Road making up the east and west approaches. The Oxford Road North arm has a two lane approach with the inside lane allowing for left turners and the outside lane providing for right turn and ahead movements. The Oxford Road South arm flares from one lane to two with the outside lane allowing for right turners and the inside lane providing for left turn and straight ahead movements. To the east the Farmfield Road approach flares from a single lane to two with the outside lane allowing for right turns and straight ahead movements and the inside lane set aside for left turners. Finally the Farmfield Road West arm has a single lane approach which allows all movements.

B.4.60 The Grange Road / Oxford Road junction takes the form of a priority junction with right-turners from Oxford Road provided with a ghost right turn lane.

B.4.61 The initial assessment of highway capacity for the existing base in 2012 indicate that:

- Bloxham Road / Wykham Lane Priority Crossroads – No capacity issues during the AM and PM peak periods;
- Bloxham Road / Springfield Avenue Priority Junction – No capacity issues during the AM and PM peak periods;
- Bloxham Road / Queensway Priority Junction – The junction is operating just over capacity in the PM peak period and close to capacity in the AM peak period and
- The Oxford Road network junctions, modelled with the College Fields scheme's improvements on Oxford Road:
    - Bloxham Road / South Bar Street / Oxford Road signalised junction – No capacity issues during the AM and PM peak periods,
    - Upper Windsor Street / Oxford Road signalised junction – No capacity issues during the AM and PM peak periods,
    - Horton View / Oxford Road / Hightown Road signalised junction – All links within capacity except Oxford Road Southbound and Horton view in the AM peak and Hightown Road and Oxford Road Southbound in the PM peak.

- Farmfield Road / Sainsbury Access / Oxford Road signalised junction – All links within capacity except the Oxford Road Southbound approach in the AM peak. All links within capacity except Oxford Road Southbound, Farmfield Road and Oxford Road Northbound in the PM peak.
- Grange Road / Oxford Road Priority Junction – No capacity issues during the AM and PM peak periods.

Public Transport

B.4.62 The nearest bus stops to the development give access to Services 488/489 which runs along Bloxham Road and Service B1 which runs along Springfield Avenue and Timms Road within the residential estate to the north-east of the development site. Details of the services are shown in Table B4.1.

Table B4.1 - Services and Frequencies

Service	Route	Frequency		
		Mon - Fri	Sat	Sun
488 / 489	Banbury – Chipping Norton	Hourly	Hourly	-
B1	Banbury – Easington	Half hourly	Half Hourly	Bi-Hourly

B.4.63 In addition to these services, there are a number of services which run from Banbury Centre to the following destinations – Stratford-upon-Avon, Shipston-on-Stour, Chipping Norton, Oxford, Brackley and Eydon enabling commuting and leisure journeys to be undertaken by bus.

B.4.64 National Express run coaches from Banbury to Gatwick, Heathrow, Birmingham, Wolverhampton and Oxford.

B.4.65 Banbury railway station lies on the Chiltern Mainline with frequent services to / from Birmingham Snowhill, Stratford-upon-Avon, Kidderminster, London Marylebone, London Paddington, Oxford, Manchester and Reading.

B.4.66 The railway station is located within cycling distance at 3.4km from the site and cycle parking is provided at the station enabling future residents of the site to undertake a multi-modal journey to work and leisure locations.

Walking and Cycling

B.4.67 Between the site access and the built up area a one metre footway is present on the western side of Bloxham Road (recorded as Public Right of Way (PRoW) 120/33); thereafter the footpath widens to a standard two metres with street lighting present.

B.4.68 Also at this location the footway meets the Salt Way Cycle Route (PRoW 120/26/39/41/42) which provides an east / west route. To the east PRoW 120/45 provides a route to Oxford Road (A4260) where the Sainsbury's supermarket is located.

B.4.69 Dropped kerbs and a pedestrian refuge are provided on Bloxham Road in the vicinity of the Salt Way Cycle route and the Browning Road junction. A Zebra crossing facility with refuge is provided between Springfield Avenue and Queensway and a Pelican crossing is provided in the vicinity of the Harriers View junction.

B.4.70 Pedestrian phases are provided within the signalised junctions on Oxford Road at the Hightown Road, Horton View and South Bar Street junctions. Dropped kerbs and a pedestrian refuge are provided within the signalised junction of Oxford Road / Upper Windsor Street.

B.4.71 A pub, hairdressers, church, convenience store, post office, primary and secondary schools, community centre, pharmacy, supermarket and doctors surgery are within 2kms (measured from the centre of the site and assuming a walk speed of 1.4 metres/second).

B.4.72 The Salt Way Cycle Route, which is traffic free and lies adjacent to the northern boundary of the site forms part of National Cycle Route 5. This route connects with villages such as Chipping Campden to the west, Bodicote to the east and Bloxham to the south.

B.4.73 To the east, a local on-road cycling promoted along Bankside providing access to the town centre and the railway station.

B.4.74 Cycling from the site widens the choice of key facilities and services available by sustainable mode to include an optician, library, hospital, vets, dentist, leisure centre and swimming pool and a cinema.

Potential Effects

Highway Network

B.4.75 The estimated number of vehicle trips generated by the Project is 189 arrivals and 460 departures in the AM peak hour and 375 arrivals and 213 departures in the PM peak hour.

B.4.76 In the Base 2017 scenario i.e. with committed traffic, junction capacity analysis reveals:

- Bloxham Road / Wykham Lane Priority Crossroads – No capacity issues during the AM and PM peak periods;
- Bloxham Road / Springfield Avenue Priority Junction – No capacity issues during the AM and PM peak periods;
- Bloxham Road / Queensway Priority Junction – The Queensway junction is operating over capacity in the AM and PM peak periods;
- The Oxford Road network junctions (with the College Fields scheme's improvements on Oxford Road);
- Bloxham Road / South Bar Street / Oxford Road signalised junction – No capacity issues during the AM and PM peak periods;
- Upper Windsor Street / Oxford Road signalised junction – No capacity issues during the AM and PM peak periods;
- Horton View / Oxford Road / Hightown Road signalised junction – No capacity issues but approaching effective capacity;
- Farmfield Road / Sainsbury Access / Oxford Road signalised junction – No capacity issues but approaching effective capacity; and
- Grange Road / Oxford Road Priority Junction – No capacity issues during the AM and PM peak periods.

B.4.77 In the Base 2022 scenario i.e. with committed traffic, junction capacity analysis reveals:

- Bloxham Road / Wykham Lane Priority Crossroads – No capacity issues during the AM and PM peak periods;

- Bloxham Road / Springfield Avenue Priority Junction – An RFC of 0.851 is recorded on Springfield Avenue during the PM peak with a queue of 5 vehicles; all other arms operate within capacity during the AM and PM peak periods;
- Bloxham Road / Queensway Priority Junction – The Queensway junction is operating over capacity in the AM and PM peak periods;
- The Oxford Road network junctions (with the College Fields scheme's improvements on Oxford Road):
    - Bloxham Road / South Bar Street / Oxford Road signalised junction – No capacity issues during the AM peak. All links with the exception of Bloxham Road operate within capacity in the PM peak periods;
    - Upper Windsor Street / Oxford Road signalised junction – No capacity issues during the AM and PM peak periods;
    - Horton View / Oxford Road / Hightown Road signalised junction – All links within capacity except Oxford Road Southbound in the AM peak. All links with the exception of Oxford Road Southbound operate within capacity during the PM peak;
    - Farmfield Road / Sainsbury Access / Oxford Road signalised junction – All links within capacity except Oxford Road Southbound in the AM peak. All links within capacity with the exception of Oxford Road Southbound, Farmfield Road and Oxford Road northbound in the PM peak; and
    - Grange Road / Oxford Road Priority Junction – No capacity issues during the AM and PM peak periods.

B.4.78 In the Forecast 2017 scenario i.e. with committed traffic + development traffic, junction capacity analysis reveals:

- Bloxham Road / Wykham Lane Priority Crossroads – No capacity issues during the AM and PM peak periods;
- Bloxham Road / Springfield Avenue Priority Junction – No capacity issues during the AM and PM peak periods;
- Bloxham Road / Queensway Priority Junction (signalisation improvement) – The results with the improvements scheme indicate that there are no capacity issues during the AM and PM peak periods;
- The Oxford Road network junctions (with the College Fields scheme's

improvements on Oxford Road + improvements to the Farmfield Road / Sainsbury Access / Oxford Road and the Bloxham Road / South Bar Street / Oxford Road junctions):

- Bloxham Road / South Bar Street / Oxford Road signalised junction – No capacity issues during the AM peak. During the PM peak all links with the exception of Bloxham Road operate within capacity. However, the improvements at this junction mean that the junction operates with improved capacity compared with the 2017 Base scenario;
- Upper Windsor Street / Oxford Road signalised junction – No capacity issues during the AM and PM peak periods;
- Horton View / Oxford Road / Hightown Road signalised junction – No capacity issues during the AM and Pm peak periods. The capacity at this junction is improved when compared with the 2017 Base Scenario;
- Farmfield Road / Sainsbury Access / Oxford Road signalised junction – No capacity issues during the AM peak. All links operate within capacity with the exception of Oxford Road Northbound and Farmfield Road. However, the improvements at this junction mean that the junction operates with improved capacity compared with the 2017 Base scenario; and
- Grange Road / Oxford Road Priority Junction – No capacity issues during the AM and PM peak periods.

B.4.79 In the Forecast 2022 scenario i.e. with committed traffic + development traffic, junction capacity analysis reveals:

- Bloxham Road / Wykham Lane Priority Crossroads – No capacity issues during the AM and PM peak periods;
- Bloxham Road / Springfield Avenue Priority Junction – An RFC of 0.864 is recorded on Springfield Avenue during the PM peak with a queue of 5 vehicles; all other arms operate within capacity during the AM and PM peak periods;
- Bloxham Road / Queensway Priority Junction – (signalisation improvement) – The results with the improvements scheme indicate that there are no capacity issues during the AM and PM peak periods;

- The Oxford Road network junctions (with the College Fields scheme's improvements on Oxford Road + improvements to the Farmfield Road / Sainsbury Access / Oxford Road and the Bloxham Road / South Bar Street / Oxford Road junctions)):
    - Bloxham Road / South Bar Street / Oxford Road signalised junction – No capacity issues during the AM and PM peak periods;
    - Upper Windsor Street / Oxford Road signalised junction – No capacity issues during the AM and PM peak periods;
    - Horton View / Oxford Road / Hightown Road signalised junction – No capacity issues during the AM and Pm peak periods;
    - Farmfield Road / Sainsbury Access / Oxford Road signalised junction – No capacity issues during the AM peak. All links operate within capacity during the PM peak with the exception of Farmfield Road and Oxford Road Northbound. However, the improvements at this junction mean that the junction operates with improved capacity compared with the 2017 Base scenario; and
    - Grange Road / Oxford Road Priority Junction – No capacity issues during the AM and PM peak periods.

B.4.80 The Project ensures, through the delivery of junction improvements, that the impact of the vehicle traffic generated is mitigated. The Forecast scenarios (with committed traffic and development traffic) show that with the delivery of the improvements that the junctions operate with more capacity than in the Base scenarios (only committed traffic).

Public Transport

B.4.81 The Project will, through the diversion of a local bus service into the site, ensure that all dwellings are within the recommended 400 metres of existing bus stops. The additional patronage that the Project will bring about on these services will help to increase their viability.

Walking and Cycling

B.4.82 The Project will result in a network of high quality streets for pedestrian and cyclists. The Project will provide pedestrian / cycle links to the existing Saltway Cycle Route and a footway / cycle link on Bloxham Road linking pedestrians and cyclists with

Banbury's existing pedestrian and cycle network and providing access to key facilities and services including the town centre, the railway station, employment areas and a foodstore.

B.4.83 The signalisation of the Bloxham Road / Queensway junction will improve pedestrian crossing facilities on Bloxham Road and Queensway.

Project Design

B.4.84 A number of initiatives are proposed as part of the Project that will reduce reliance upon the private car and provide residents with a real choice of modes of travel.

Public Transport

B.4.85 An existing bus service will be diverted into the site enabling all dwellings to be within 400 metres of a bus service. Bus stops within the site will be provided with shelters, timetable displays and bus boarder kerbs.

Walking and Cycling

B.4.86 The Project will be deigned to provide safe and convenient walking and cycling routes throughout the site, such as to the Primary School and Local Centre, and will link into walking and cycling facilities outside of the site.

B.4.87 All community facilities will be provided with high quality secure cycle parking facilities close to the main access to the buildings / facilities.

Street Pattern

B.4.88 The street pattern within the Project will be designed at the detailed design stage to meet with the standards as set out within DfT's Manual for Streets and other best practice design documents.

B.4.89 The street pattern will be deigned on a legible and direct network of interconnected routes. Streets will be overlooked by properties and will act as functional community spaces. Streets will not be designed on motor traffic criteria and will be interesting, varied and attractive, offering higher levels of pedestrian and cycle priority than 'estate' style street patterns; it will be safe and welcoming for pedestrians and cyclists and will be well specified and constructed. The Design and Access Statement

which accompanies the application provides some general design principles for the street pattern.

B.4.90 Traffic speed will be carefully controlled by design so as to create a calm and safe environment for all. This will consider a range of common design options such as changes in horizontal alignment, reduced forward visibility, a number of converging streets, reduced street widths, the use of street trees, key buildings and changes in street materials.

Travel Plans

B.4.91 The travel plans for residents and other occupiers of the Project will play an important role in promoting the use of public transport, cycling and walking. The TP for the residential component and employment components which accompanies the application includes specific measures and will be finalised and implemented prior to the occupation of the residential units and employment. The TP for the primary school will be developed following occupation of the building.

B.4.92 The requirements for the travel plans will be secured by condition and will be monitored by travel plan co-ordinators of the residential, employment and educational elements and by OCC.

Site Access

B.4.93 The site access has been designed to provide a safe and convenient assess into the site and to cater in terms of capacity with the traffic generated by the project and the expected traffic levels on Bloxham Road in 2022.

Junction Improvements

B.4.94 The Project will deliver the following improvements:

- Signalisation of the Bloxham Road / Queensway junction giving improvements in capacity and pedestrian improvements; and
- Bloxham Road / South Bar / Oxford Road – provision of a longer left turn lane on Bloxham Road and a left turn flare on Oxford Road north into Bloxham Road and signal staging improvements.

B.4.95 The other improvements on the Oxford Road Network will be delivered by committed developments at College Field and Sainsburys.

Highway Improvements

B.4.96 The 30mph traffic limit on Bloxham Road will be extended to the south of the Bloxham Road / Wykham Lane junction.

B.4.97 Vehicle numbers along Wykham Lane will reduce due to the existing farm shop being accessed from within the development site.

Assessment of Effect

Public Transport

B.4.98 The diversion of an existing bus route providing additional patronage arising from new residents and the provision of quality bus shelters within the site will have a moderate long term beneficial effect on public transport.

Walking and Cycling

B.4.99 The construction of quality, safe and convenient walking and cycle routes within the site and links to the existing Banbury walking and cycle network will have a moderate long term beneficial effect on walking and cycling in the local area.

B.4.100 The provision of improved pedestrian crossing facilities at the Bloxham Road / Queensway junction will have a moderate long term beneficial effect on walking and cycling in the local area.

Travel Plans

B.4.101 The Travel Plans will promote travel by means other than single occupancy vehicles, thus lowering traffic generation from the Project and will have a substantial long term beneficial effect.

Site Access

B.4.102 The proposed roundabout junction will cater for the traffic generated by the Project and for the expected vehicle movements along Bloxham Road in 2022 and the long term affect will be negligible.

Junction Improvements

B.4.103 The modifications proposed at the Bloxham Road / Queensway and Bloxham Road / South Bar Street / Oxford Road junctions will ensure that the junctions are able to cater for the traffic generated by the Project and the expected level of background traffic in 2022 and will bring about a long term moderate beneficial impact.

B.4.104 The modifications brought about by the Project and the committed development will have a long term moderate beneficial impact on the Oxford Road network.

Other Highway Improvements

B.4.105 The relocation of the access to the existing Wykham Lane farmshop, the majority of traffic associated with this use will be removed from Wykham Lane resulting in a long term beneficial impact in terms of highway safety on Wykham Lane.

Demolition and Construction

B.4.106 The Project will be market driven and hence it has not been possible to quantify the number of movements of construction related vehicles on a daily or weekly basis due to uncertainties over timescales of construction. However, as part of any Construction Management Plan and as a matter of best practice construction deliveries are likely to be limited to certain hours of the day and specific appropriate Construction Routing Agreements are likely to be made with OCC. The construction period will be short term and its overall significance is therefore reduced. Due to the nature of the construction process there is likely to be a temporary minor adverse effect.

Residual Effects

B.4.107 There will be an increase in traffic when compared to current traffic levels experienced on the local highway network. With the proposed junction improvements and other mitigation measures including junction improvements and the implementation of Travel Plans the anticipated traffic movements can be accommodated in capacity and safety terms on the surrounding highway network. The proposed junction improvements and other measures will improve the operation of the highway network in capacity and safety terms when compared with the Base Scenarios. The residual impact of the increase in vehicle movements on the

local highway network brought about by the operation of the Project will be negligible.

B.4.108 The provision of a diverted local bus service providing additional patronage and the provision of quality bus shelters within the site will have a moderate beneficial residual effect on public transport.

B.4.109 The construction of high quality, safe and convenient pedestrian routes within the site linking into Banbury's existing pedestrian and cycling network along with pedestrian improvements at the Bloxham Road / Queensway junction will have a moderate beneficial residual effect on walking and cycling.

B.4.110 The relocation of the access to the exitsing Wykham Lane farmshop, the majority of this will be removed from Wykham Lane resulting in a long term beneficial impact in terms of highway safety on Wykham Lane.

Statement of Effects

B.4.111 Whilst measures have been designed to mitigate the effects of the Project there will be an inevitable overall increase in traffic levels compared with expected levels in 2017 and 2022. It is concluded in the TA that with appropriate mitigation measures the local network would have the capacity to absorb this without causing any detrimental effect. The site is located in a sustainable location with access by public transport, walking and cycling to a wide range of local services and facilities and offers good opportunities for travel by sustainable modes of transport. The design of the Project, the measures introduced to encourage cycling, walking and the use of public transport and the proposed mitigation measures will mean that the Project will bring about a minor beneficial effect on the environment in terms of traffic and transport.

B.5 AIR QUALITY AND DUST

Introduction

B.5.1 This Chapter of the ES assesses the potential air quality impacts associated with the additional road traffic generated by the proposed development at Wykham, Oxfordshire. A qualitative assessment has been undertaken to assess the potential air quality impacts of dust arising from the construction phase of works and impacts from construction traffic. Air dispersion modelling, using ADMS-Roads, has also been carried out to assess the potential air quality impact of development generated traffic.

B.5.2 This Chapter should be read in conjunction with Section A of the ES, which give details of the site location and development works to be undertaken at the site.

Planning Policy Context

Air Quality Standards and Objectives

B.5.3 The UK National Air Quality Strategy (NAQS) was published in March 1997 fulfilling the requirement under the Environment Act 1995 for a national air quality strategy setting out policies for the management of ambient air quality. The Strategy sets objectives for eight pollutants, which may potentially occur in the UK at levels that give cause for concern. These pollutants are: nitrogen dioxide, sulphur dioxide, carbon monoxide, lead, fine particulates (PM_{10}), benzene, 1,3–butadiene and ozone.

B.5.4 The Strategy was reviewed and a Review Report[1] and Consultation Document[2] were published by the Department of the Environment, Transport and the Regions in 1999. A revised version (The Air Quality Strategy (AQS) 2000), which supersedes the 1997 Strategy, was published in January 2000. The AQS 2000 strengthens the objectives for a number of pollutants with the exception of that for particulates, which was replaced with the less stringent EU limit value.

B.5.5 The objectives for the eight pollutants in the Strategy provide the basis of the implementation of Part IV of the Environment Act 1995. The Air Quality Strategy objectives for each pollutant, except ozone, were given statutory status in the Air

[1] Department of the Environment, Transport and the Regions, January 1999. Report on the Review of the National Air Quality Strategy, Proposals to amend the Strategy.
[2] Department of the Environment, Transport and the Regions 1999, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. A consultation document.

Quality (England) Regulations, 20003 and Air Quality (England) (Amendment) Regulations 20024 ('the Regulations').

B.5.6 In 2007 the Air Quality Strategy was revised. This latest strategy[5] does not remove any of the objectives set out in the previous strategy or its addendum, apart from replacing the provisional 2010 objective for PM_{10} in England, Wales and Northern Ireland with the exposure reduction approach for $PM_{2.5}$. The UK Government and the Devolved Administrations have now therefore set new national air quality objectives for particulate matter smaller than 2.5µm diameter ($PM_{2.5}$).

B.5.7 EU Directive 2008/50/EC[6] came into force in June 2008 and was transposed into legislation in England on 11th June 2010 as 'The Air Quality Standards Regulations 2010'[7]. This EU Directive consolidates existing air quality legislation and provides a new regulatory framework for $PM_{2.5}$.

B.5.8 The current Air Quality Standards and Objectives, as set out in the Air Quality Standards Regulations 2010, are detailed in Table B5.1.

Table B5.1 - Air Quality (England) Regulations 2010. Summary of Current Air Quality Standards and Objectives

Pollutant	Averaging Period	Limit Value
Sulphur Dioxide	1 hour	350µg/m^3 not to be exceeded more than 24 times a calendar year
	1 day	125µg/m^3 not to be exceeded more than 3 times a calendar year
Nitrogen Dioxide	1 hour	200µg/m^3 not to be exceeded more than 18 times a calendar year
	Calendar year	40µg/m^3
Benzene	Calendar year	5µg/m^3
Lead	Calendar year	0.5µg/m^3

[3] The Air Quality (England) Regulations 2000. SI No 928.
[4] The Air Quality (Amendment) Regulations 2002.
[5] Department of Environment, Food and Rural Affairs, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. July 2007.
[6] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on Ambient Air Quality and Cleaner Air for Europe.
[7] Statutory Instruments 2010 No. 1001 The Air Quality Standards Regulations 2010.

Pollutant	Averaging Period	Limit Value
PM_{10}	1 day	50µg/m^3 not to be exceeded more than 35 times a calendar year
	Calendar year	40µg/m^3
$PM_{2.5}$	Calendar year	25µg/m^3 to be met by 1st January 2015
Carbon Monoxide	Maximum 8 hour daily mean	10mg/m^3
Pollutant	**Target Value for the total content in the PM_{10} fraction averaged over a calendar year**	**Date by which target value should be met**
Arsenic	6ng/m^3	31st December 2012
Cadmium	5ng/m^3	31st December 2012
Nickel	20ng/m^3	31st December 2012
Benzo(a)pyrene	1ng/m^3	31st December 2012

B.5.9 Examples of where the Air Quality Objectives should/should not apply are included in Table B5.2. This table is taken from Local Air Quality Management Technical Guidance document LAQM.TG (09)[8].

Table B5.2 - Examples of where the Air Quality Objectives Should/Should Not Apply

Averaging Period	Objectives Should Apply At	Objectives Should Generally Not Apply At
Annual Mean	All background locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, libraries, etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites or any other location where public exposure is expected to be short term.
24 hour (daily) mean 8 hour mean	All locations where the annual mean objectives would apply together with Hotels. Gardens of residential properties[1]	Kerbside sites, or any other location where public exposure is expected to be short term.

[8] Part IV of the Environment Act 1995: Local Air Quality Management Technical Guidance 2009.

Averaging Period	Objectives Should Apply At	Objectives Should Generally Not Apply At
1 hour mean	All locations where the annual mean and 24 and 8-hour objectives apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks and railway stations etc. which are not fully enclosed where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations to which the public might reasonably be expected to spend one hour or longer.	Kerbside sites where public would not be expected to have regular access.
15 min mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	
[1]: Such locations should represent parts of the garden where relevant public exposure is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure would occur at the extremities of the garden boundary, or in front gardens although local judgement should always be applied.		

B.5.10 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, July 2007, establishes the framework for air quality improvements based on measures agreed at a national and international level. However, despite these measures, it is recognised that areas of poor air quality will remain and these should be dealt with through the Local Air Quality Management (LAQM) process using locally implemented measures.

B.5.11 LAQM legislation in the Environment Act 1995 requires local authorities to conduct periodic review and assessments of air quality. These aim to identify all those areas where the air quality objectives are being, or are likely to be, exceeded.

B.5.12 All Authorities were required to undertake the first stage of review and assessment which concluded in September 2001. In those areas identified as having the potential to experience elevated levels of pollutants the authority was required to undertake a more detailed second stage review comprising two steps; Updating and Screening Assessments and Detailed Assessments. Where it was predicted that one or more of the air quality objectives would be unlikely to be met by the end of 2005, local authorities were required to proceed to a third stage, and if necessary, declare Air

Quality Management Areas and make action plans for improvements in air quality, in pursuit of the national air quality objectives.

B.5.13 In 2007 an Evaluation Report was commissioned by the UK Government and Devolved Administrations. Following this review revised LAQM Technical Guidance was published in February 2009 comprising LAQM. TG(09). This revised guidance draws together previous guidance and the recommendations of the 2007 Evaluation Report. TG(09) maintains the phased approach to review and assessment established in previous technical guidance. The intention is that local authorities should only undertake a level of assessment that is commensurate with the risk of an air quality objective being exceeded.

B.5.14 Where a Detailed Assessment indicates that any of the air quality objectives are likely to be exceeded, an Air Quality Management Area (AQMA) must be designated, or the geographical boundaries of an existing AQMA must be confirmed. An AQMA should only be declared if a Detailed Assessment has been undertaken.

B.5.15 Once an AQMA has been declared the local authority is required to undertake a Further Assessment within 12 months of the declaration.

B.5.16 A rolling programme of Updating and Screening Assessment and Detailed Assessment based on a three-year cycle has been laid down by Defra in its TG(09) policy guidance (Defra 2009). This is supplemented by Progress Reports which are intended to maintain continuity in the LAQM process between the three-yearly cycle of Review and Assessment. Progress Reports are required in the years when the authority is not completing an Updating and Screening Assessment.

Cherwell District Council Local Air Quality Management Review and Assessment

B.5.17 Cherwell District Council (CDC) declared an Air Quality Management Area (AQMA), in 2010, for exceedences of the annual mean and hourly objectives for nitrogen dioxide (NO2). The AQMA covers the A422 Hennef Way in the centre of Banbury, between the A4260 Concord Avenue and Ermont Way; approximately 2.8km to the north of the proposed development.

B.5.18 The 2009 USA identified exceedances of the annual mean objective for NO2 at the A361 Horsefair and Hennef Way in Banbury and at Queens Avenue in Bicester. The report concluded that air quality objectives are being achieved at all other monitoring locations throughout the district.

B.5.19 A detailed assessment was subsequently undertaken by CDC for Hennef Way in 2010 and the AQMA declared. The report also concluded that further monitoring should be undertaken along Hennef Way and at the closest areas of exposure i.e. at the residential properties along Stroud Close and Fisher Close.

B.5.20 CDC undertakes air quality monitoring within the Cherwell district and currently operates one roadside continuous analyser, at Hennef Way in Banbury, and approximately sixteen diffusion tube monitoring sites.

B.5.21 The proposed development is not located within an existing AQMA. The closest background monitoring location is a diffusion tube located at Cranleigh Close, on the southern edge of Banbury, approximately 0.7km to the north. In 2011, this recorded a background of 13.9µg/m^3 which is considered to be representative of background concentrations at the proposed development.

B.5.22 The closest roadside diffusion tubes to the proposed development are those located along the A361 Bloxham Road and A260/ B4100 Oxford Road. In 2011, these diffusion tubes measured annual mean concentrations of between 39.7µg/m^3 and 46.2µg/m^3.

Assessment Methodology

Construction Phase – Construction Traffic

B.5.23 Traffic flow information for the construction phase of the development is not available at this stage and therefore it is not possible to undertake a quantitative assessment of the impact of these additional vehicles at existing sensitive receptor locations.

B.5.24 Although construction phase vehicle numbers are not available at this stage, it is anticipated that this traffic will access the site via the proposed site access from the A361 Bloxham Road. Given the existing high volume of traffic travelling along

Bloxham Road, the number of additional vehicles associated with the construction phase of the development is not considered to be significant and are not considered further within this chapter.

Construction Phase Assessment – Dust Emissions

B.5.25 To assess the impacts associated with dust and PM_{10} releases, during the construction phase of the development, an assessment has been undertaken in accordance with the Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance* ' (January 2012).

Step 1

B.5.26 Step 1 of the assessment is to screen the requirement for a more detailed assessment. The guidance states that an assessment will normally be required where there are existing sensitive receptors within 350m of the site boundary and/or within 100m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance.

B.5.27 The exact route of the construction vehicles is not known at this stage. There are however existing sensitive receptors located within 350m of the site boundary. It is therefore, necessary to proceed to Step 2 of the assessment.

Step 2

B.5.28 Step 2 of the assessment determines the potential risk of dust arising in sufficient quantities to cause annoyance and/or health effects. The risk is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc);
- The duration of these activities;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activity;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of receptors to dust.

B.5.29 The risk of dust effects is determined using three risk categories: low risk, medium risk or high risk. A site is allocated to a risk category based upon the scale and nature of the works and the proximity of receptors.

B.5.30 The risk of dust effects is determined for four types of construction phase activities, with each activity being considered separately. If a construction phase activity is not taking place on the site, then it does not need to be assessed. The four types of activities to be considered are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

Step 3

B.5.31 Step 3 of the assessment determines the site-specific mitigation required for each of the activities, based on the risk determined in Step 2. Mitigation measures are detailed in guidance published by the Greater London Authority[9], which is recommended for use outside the capital by LAQM guidance, and the IAQM 'Dust and Air Emissions Mitigation Measures' matrix[10]. If the risk is classed as negligible, no mitigation measures beyond those required by legislation will be necessary.

Step 4

B.5.32 Step 4 assesses the significance of the dust effects on existing sensitive receptors for the four construction phase activities. The sensitivity of the area surrounding the site is assessed against the risk of the activities at the site to give rise to dust effects.

B.5.33 The significance of the effect is assessed assuming that measures to minimise dust generation are in place and therefore it is the residual impacts that are reported.

Existing Sensitive Receptors

B.5.34 The closest existing sensitive receptors to the proposed development are residential and educational in nature and are detailed in Table B5.3.

[9] Greater London Authority (2006) The Control of Dust and Emissions from Construction and Demolition: Best Practice Guidance

[10] Institute of Air Quality Management (2012) Dust and Air Emissions Mitigation Measures

Table B5.3 - Existing Sensitive Receptors: Construction Phase Dust Assessment

Receptor	Direction from the Site	Approximate Distance from the Site Boundary
The Lodge, Bloxham Road	West	7m
Residential properties along Foxwood Close, Leawood Close and Jaynes Close	North	10m at closest points (i.e. 4 Foxwood Close, 5 Leawood Close and 4 Jaynes Close)
Wykham Farm Cottages	South	12m
1 and 2 Crouch Cottages, Bloxham Road	West	20m
Residential properties along Grange Road	North and North East	38m at closest point (i.e. 102 Grange Road)
Residential properties along Waller Drive	North West	52m at closest point (i.e. 6 Waller Drive)
Banbury School	North	65m
Residential properties along Lansdown Close	North West	68m at closest point (i.e. 19 Lansdown Close)
Stone Barn, Wykham Park Farm	South	79m
Wykham Farm, Georges Barn and The Great Barn	South	105m at closest point (i.e. The Great Barn)
The Bungalow, Bloxham Road	West	141m
Residential properties along Wykham Lane including: Holly Lodge, Safine House, Todd Cottage and Leylands	South and South East	332m at closest point (i.e. Holly Lodge)

Operational Phase Assessment – Road Traffic Emissions

Modelling of Road Traffic Emissions

B.5.35 The air dispersion model ADMS-Roads (CERC, Version 3.1) has been used to assess the potential impact of development generated traffic on local air quality at existing receptor locations. In addition, pollutant concentrations have also been predicted at the proposed sensitive areas of the development i.e. at locations representative of the proposed residential dwellings.

B.5.36 The air dispersion model has been used to predict nitrogen dioxide (NO_2) and particulate matter (PM_{10}) concentrations, as these are the pollutants most likely to exceed the air quality objectives.

B.5.37 Air quality modelling has been carried out for three different years, as follows:

- The verification and base year (2011): This is the year used to verify the model. It is the most recent year for which traffic data, meteorological data and air quality monitoring data are available;
- The proposed opening year of the development (2017): This is considered both without the development and with the development in place; and
- A future year (2022): This is considered both without the development and with the development in place.

Road Traffic Data

B.5.38 The ADMS-Roads model requires the input of detailed road traffic flow information for those routes which will be affected by the proposed development. The traffic flow information used in the assessment is included in Appendix B5.1.

B.5.39 Detailed traffic flow information, for use in the ADMS-Roads model, has been obtained from SBA, the appointed transport consultant for the project. The traffic flow information has been provided as 24 hour AADT flows, with HGV percentages.

B.5.40 Traffic flow information has been provided for the verification and base year (2011); an opening year (2017) and a future year (2022) for both the 'without development' and 'with development' scenarios.

B.5.41 Traffic flow information has been provided, by the transport consultants, for the following roads:

- A361 Bloxham Road;
- A260/ B4100 Oxford Road;
- A361 Horsefair/ North Bar Street;
- Queensway;
- Springfield Avenue; and
- Proposed site access from Bloxham Road.

B.5.42 Air quality modelling has been carried out to estimate pollutant concentrations, due to road traffic emissions, for a total of five scenarios:

- Scenario 1: 2011 Verification and Base Year;
- Scenario 2: 2017 Proposed Opening Year, Without Development i.e. Future

Baseline + Committed Development Traffic;

- Scenario 3: 2017 Proposed Opening Year, With Development, i.e. Future Baseline + Committed Development Traffic + Application Development Traffic;
- Scenario 4: 2022 Future Assessment Year, Without Development i.e. Future Baseline + Committed Development Traffic; and
- Scenario 5: 2022 Future Assessment Year, With Development i.e. Future Baseline + Committed Development Traffic + Application Development Traffic.

Meteorological Data

B.5.43 The meteorological data used in the air quality modelling has been provided by the Met Office. Meteorological data has been obtained for 2011 from the Church Lawford recording station.

B.5.44 The Church Lawford station is located approximately 35km from the proposed development. This recording station is considered to be the most representative of the conditions at the proposed development due to its relative location to the proposed development and similar altitude. The meteorological data provides hourly wind speed and direction information. The 2011 wind rose for Church Lawford is included in Appendix B5.2.

Existing Sensitive Receptor Locations

B.5.45 Representative existing sensitive receptor locations (identified as ESR 1 to ESR 6) have been selected long those routes most likely to be affected by the proposed development. Existing sensitive receptors are shown on drawing number B5.1 and detailed in Table B5.4.

Table B5.4 - Existing Sensitive Receptor Locations

Receptor	Address	Grid Reference		Type of Receptor
		Easting	Northing	
ESR 1	The Bungalow, Bloxham Road	444005	238378	Residential
ESR 2	2 Crouch Cottages, Bloxham Road	444173	238753	Residential
ESR 3	2 Lansdown Close	444525	239099	Residential
ESR 4	123 Bloxham Road	444963	239543	Residential

Receptor	Address	Grid Reference		Type of Receptor
		Easting	Northing	
ESR 5	9 Oxford Road	445342	240081	Residential
ESR 6	1 Gables Court, Oxford Road	445400	239840	Residential

Proposed Sensitive Receptor Locations

B.5.46 Proposed sensitive receptor locations (identified as PR 1 and PR 2) have been selected within the site at locations considered representative of the proposed residential areas.

B.5.47 Pollutant concentrations have been predicted for Scenarios 3 and 5 (as detailed in paragraph B5.42). It is only necessary to consider the 'with development' scenarios for proposed receptor locations as they will not experience any 'without development' conditions. It is not therefore necessary to consider the changes in pollutant concentrations at the proposed receptor locations.

B.5.48 The proposed sensitive receptor locations, considered in this assessment, are detailed in Table B5.5 and shown on drawing number B5.1.

Table B5.5 - Proposed Sensitive Receptor Locations

Receptor Point	Location	Grid Reference	
		Easting	Northing
PR 1	Location considered representative of the proposed residential areas closest to the A361 Bloxham Road and the proposed site access; in the western part of the site	444254	238777
PR 2	Location considered representative of the proposed residential areas closest to the A361 Bloxham Road; in the north western part of the site	444293	238853

Model Validation, Verification and Adjustment

B.5.49 Defra Local Air Quality Management Technical Guidance, 2009, (LAQM.TG(09)) recognises that model validation generally refers to detailed studies that have been carried out by the model supplier or a regulatory agency. The ADMS-Roads model has been validated by the supplier CERC.

B.5.50 Model verification is required to check the performance of the model at a local level. The verification of the ADMS-Roads model has been achieved by modelling concentrations at existing monitoring locations and comparing the modelled concentrations with the measured concentrations.

B.5.51 As there is no roadside continuous analyser, located along the routes adjacent to the proposed development, bias-adjusted monitoring data from seven representative diffusion tube locations, has been used. These diffusion tubes are located between 1 and 2m from the closest kerb and are therefore classed as roadside locations, in accordance with LAQM.TG(09).

B.5.52 The diffusion tube monitoring data used in the model verification procedure is summarised in Table B5.6.

Table B5.6 - 2011 Diffusion Tube Data, NO_2

Site Name	Grid Reference		NO_2 Annual Average with Bias Correction Applied* (2011)
	X	Y	
Oxford Road	445581	239365	40.40
North Bar	445352	240744	43.80
Oxford Road/ South Bar	445333	240100	39.40
Bloxham Road	445318	240068	46.20
Horsefair (1)	445351	240578	45.60
Horsefair (2)	445351	240578	48.30
Horsefair (3)	445351	240578	48.00

B.5.53 It has not been possible to carry out verification for PM10 concentrations as monitoring data is not available in the vicinity of the proposed development.

B.5.54 Further details of the model verification procedure are included in Appendix B5.3. Uncorrected and corrected pollutant concentrations are included in Appendices B5.4 and B5.5, respectively.

Information Sources

B.5.55 The following sources of information have been used in the preparation of this report:

- Part IV Environment Act, Chapter 25, Air Quality, 1995;
- DEFRA, The UK National Air Quality Strategy, March 1997;
- The Air Quality Standards Regulations 2010;
- Department for the Environment, Food and Rural Affairs, Local Air Quality Management Technical Guidance LAQM.TG(09), published February 2009;
- Environment Protection UK (EPUK) Development Control: Planning for Air Quality (2010 Update), 2010;
- Institute of Air Quality Management (IAQM), Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance, published January 2012;
- Cherwell District Council, Air Quality Updating and Screening Assessment, 2009;
- Cherwell District Council, Air Quality Detailed Assessment – Hennef Way, Banbury, 2010; and
- Traffic flow information, provided by SBA (detailed in Appendix B5.1).

Assessment of Significance

Construction Phase Assessment – Dust Emissions

B.5.56 The Institute of Air Quality Management (IAQM) guidance document 'Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance '(January 2012), details significance criteria for the classification of dust effects from demolition, earthworks, construction and trackout. These criteria are summarised in Tables B5.7 to B5.11 below.

Sensitivity of the Location

B.5.57 The sensitivity of the location is determined using the criteria detailed in Table B5.7.

Table B5.7 - Examples of Factors Determining Sensitivity of an Area

Sensitivity of Area	Human Receptors
Very High	Very densely populated area; More than 100 dwellings within 20m of the site; Local PM_{10} concentrations exceed the objective; Contaminated buildings present; Very sensitive receptors (e.g. oncology units); and Works continuing in one area of the site for more than one year.
High	Densely populated area; 10-100 dwellings within 20m of the site; Local PM_{10} concentrations close to the objective (e.g. annual mean 36-40µg/m^3); and Commercially sensitive horticultural land within 20m of the site.
Medium	Suburban or edge of town area; Less than 10 receptors within 20m of site; and Local PM_{10} concentrations below the objective (e.g. annual mean 30-36µg/m^3).
Low	Rural or industrial area; No receptors within 20m of the site; Local PM_{10} concentrations well below the objective (less than 75%); and Wooded area between site and receptors.

Demolition

B.5.58 The risk of dust being generated by demolition activities at the site is determined using the criteria in Table B5.8.

Table B5.8 - Risk Category from Demolition Activities

Distance to Nearest Receptor (m)*	Dust Emission Class		
Dust Soiling and PM_{10}	**Large**	**Medium**	**Small**
<20	High Risk Site	High Risk Site	Medium Risk Site
20 – 100	High Risk Site	Medium Risk Site	Low Risk Site
100 – 200	Medium Risk Site	Low Risk Site	Low Risk Site
200 – 350	Medium Risk Site	Low Risk Site	Negligible
**Distances from the dust emission source. Where not known then the distance should be from the site boundary. The risk is based on the distance to the nearest receptor*			

Earthworks and Construction Activities

B.5.59 The risk of dust being generated by earthworks and construction activities at the site is determined using the criteria in Table B5.9.

Table B5.9 - Risk Category from Earthworks and Construction Activities

Distance to Nearest Receptor (m)*	**Dust Emission Class**		
Dust Soiling and PM_{10}	**Large**	**Medium**	**Small**
<20	High Risk Site	High Risk Site	Medium Risk Site
20 – 50	High Risk Site	Medium Risk Site	Low Risk Site
50 – 100	Medium Risk Site	Medium Risk Site	Low Risk Site
100 – 200	Medium Risk Site	Low Risk Site	Negligible
200 – 350	Low Risk Site	Low Risk Site	Negligible
**These distances are from the dust emission source. Where this is not known then the distance should be from the site boundary. The risk is based on the distance to the nearest receptor*			

Trackout

B.5.60 The risk of dust being generated by trackout from the site is determined using the criteria in Table B5.10.

Table B5.10 - Risk Category from Trackout

Distance to Nearest Receptor (m)*	**Dust Emission Class**		
Dust Soiling and PM_{10}	**Large**	**Medium**	**Small**
<20	High Risk Site	Medium Risk Site	Medium Risk Site
20 – 50	Medium Risk Site	Medium Risk Site	Low Risk Site
50 – 100	Low Risk Site	Low Risk Site	Negligible
**For trackout the distance is from the roads used by construction traffic*			

Significance of Effect

B.5.61 Once the risk of dust being generated by earthworks, construction and trackout activities has been identified, the significance of the dust effect can be assessed using the criteria in Table B5.11.

Table B5.11 - Significance of Effects for Each Activity with Mitigation

Sensitivity of Surrounding Area	Risk of Site Giving Rise to Dust Effects		
	High	**Medium**	**Low**
Very High	Slight Adverse	Slight Adverse	Negligible
High	Slight Adverse	Negligible	Negligible
Medium	Negligible	Negligible	Negligible
Low	Negligible	Negligible	Negligible

Operational Phase Assessment – Road Traffic Emissions

Air Quality Significance Criteria

B.5.62 In order to assess the significance of the impact of the operational phase of the proposed development on local air quality, significance criteria have been used for NO_2 and $PM_{10.}$ These criteria are detailed in Tables B5.12 and B5.13. The criteria relate to NO_2 and PM_{10} only, as these are the pollutants most likely to exceed the air quality objectives. The criteria are taken from Environmental Protection UK (EPUK) document 'Development Control: Planning for Air Quality (2010 Update)'.

B.5.63 The impact magnitude and impact descriptors in relation to specific objectives for annual mean NO_2 and PM_{10} concentrations are detailed in Table B5.12.

Table B5.12 - Definition of Impact Magnitude for Changes in Annual Mean NO_2 and PM_{10} Concentration

Magnitude of change	Annual Mean
Large	Increase/decrease >4µg/m^3
Medium	Increase/decrease 2-4µg/m^3
Small	Increase/decrease 0.4-2µg/m^3
Imperceptible	Increase/decrease <0.4µg/m^3

B.5.64 The EPUK document indicates that when describing an air quality impact at a specific receptor, the actual concentration at the receptor should be taken into account, in combination with the magnitude of change, using the approach detailed in Table B5.13. This approach is appropriate for the assessment of annual mean concentrations of NO_2 and PM_{10} in England i.e. where the objective concentration is 40µg/m^3.

Table B5.13 - Air Quality Impact Descriptors for Changes to Annual Mean NO_2 and PM_{10} Concentrations at a Receptor

Absolute concentration in relation to objective / limit value	Change in concentration*		
	Small	Medium	Large
Increase with scheme			
Above objective/limit value with scheme (>40µg/m^3)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just below objective/limit value with scheme (36-40µg/m^3)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below objective/limit value with scheme (30-36µg/m^3)	Negligible	Slight Adverse	Slight Adverse
Well below objective/limit value with scheme (<30µg/m^3)	Negligible	Negligible	Slight Adverse
Decrease with scheme			
Above objective/limit value without scheme (>40µg/m^3)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just below objective/limit value without scheme (36-40µg/m^3)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below objective/limit value without scheme (30-36µg/m^3)	Negligible	Slight Beneficial	Slight Beneficial
Well below objective/limit value without scheme (<30µg/m^3)	Negligible	Negligible	Slight Beneficial

**An imperceptible change (see Table B5.12) would be described as negligible*

Impact Magnitude and Receptor Sensitivity

B.5.65 The significance of an environmental impact for vehicular emissions is determined by the interaction of magnitude and sensitivity. The methodology for determining the sensitivity of the receptor is shown in Table B5.14.

Table B5.14 - Methodology for Determining Sensitivity

Sensitivity	Methodology
High	The location has little ability to absorb change without fundamentally altering its present character, or is of international or national importance. e.g. a hospital
Moderate	The location has moderate capacity to absorb change without significantly altering its present character, or is of high importance. e.g. a residential dwelling
Low	The location is tolerant of change without detriment to its character, is of low or local importance. e.g. an industrial development

B.5.66 The Impact Significance Matrix used in this assessment is shown in Table B5.15.

Table B5.15: Impact Significance Matrix

Magnitude of Impact	Sensitivity		
	High	**Moderate**	**Low**
Substantial	Substantial Adverse/Beneficial	Substantial – Moderate Adverse/Beneficial	Substantial – Minor Adverse/Beneficial
Moderate	Substantial – Moderate Adverse/Beneficial	Moderate – Slight Adverse/Beneficial	Slight Adverse/Beneficial
Slight	Moderate – Slight Adverse/Beneficial	Slight Adverse/Beneficial	Slight – Negligible
Negligible	Negligible/Not Significant	Negligible/Not Significant	Negligible/Not Significant

Baseline Situation

Operational Phase Assessment – Road Traffic Emissions

Background Air Pollutant Concentrations

B.5.67 The ADMS assessment needs to take into account background concentrations upon which the local, traffic derived pollution is superimposed. The data may be derived through long term ambient measurements at background sites, remote from immediate sources of air pollution or alternatively from the default concentration maps, which have been provided for use with the revised LAQM.TG(09) guidance.

B.5.68 Cherwell District Council (CDC) currently operates a background diffusion tube at Cranleigh Close, approximately 0.7km to the north of the proposed development. This is considered to be representative of background NO_2 concentrations at the site. Background NO_x concentrations have been derived from this using the diffusion tube worksheet included within the Defra NO_x to NO_2 calculator[11.]

B.5.69 In the absence of data being available from a representative background continuous analyser, background PM_{10} concentrations have been obtained from the 2010 based default concentration maps provided by Defra on their Local Air Quality Management web pages (http://laqm.defra.gov.uk/review-and-

[11] NO_x to NO_2 Calculator, Defra Local Air Quality Management web pages (http://laqm.defra.gov.uk/tools-monitoring-data/no-calculator.html)

assessment/tools/background-maps.html). As the receptors are located within a number of grid squares, the highest PM_{10} concentration has been used in the assessment.

B.5.70 Current evidence suggests that nitrogen dioxide (NO_2) background concentrations are not decreasing in accordance with expected reductions. At present, there is uncertainty about how background NO_2 concentrations will change in future years. To provide a robust assessment, current year (i.e. 2011) background concentrations and emission factors have been used in the opening and future year model scenarios. This is considered to be a conservative approach, as it is likely that there will some improvement in background air quality and emission factors by 2022.

B.5.71 The background pollutant concentrations used in the assessment are detailed in Table B5.16.

Table B5.16 - Background NO_x and NO_2 Concentrations Obtained from the Cranleigh Close Urban Background Diffusion Tube. Background PM_{10} Concentrations Obtained from the Defra Default Concentration Maps

Pollutant	2011 Concentrations (µg/m^3)
Oxides of Nitrogen (NO_x)	21.53
Nitrogen Dioxide (NO_2)	13.9
Particulates (PM_{10})	16.28

Modelled Baseline Concentrations

B.5.72 The baseline assessment (i.e. Scenarios 1, 2 and 4) has been carried out for the six existing sensitive receptors considered (ESR 1 to ESR 6). The uncorrected PM_{10} and corrected NO_2 concentrations are detailed in Table B5.17 and included in Appendices B5.4 and B5.5, respectively.

Table B5.17 - Predicted NO_2 and PM_{10} concentrations at Existing Sensitive Receptor Locations for 2011, 2017 and 2022 'Without Development' Scenarios

Receptor	Calculated Annual Mean Concentrations (µg/m^3)					
	NO_2 (Corrected)*			PM_{10} (Uncorrected)		
	Scenario 1: 2011	Scenario 2: 2017	Scenario 4: 2022	Scenario 1: 2011	Scenario 2: 2017	Scenario 4: 2022
ESR 1	23.34	23.82	24.03	17.40	17.46	17.49
ESR 2	28.35	29.02	29.33	18.05	18.14	18.18

Receptor	Calculated Annual Mean Concentrations (µg/m^3)					
	NO_2 (Corrected)*			PM_{10} (Uncorrected)		
	Scenario 1: 2011	Scenario 2: 2017	Scenario 4: 2022	Scenario 1: 2011	Scenario 2: 2017	Scenario 4: 2022
ESR 3	23.94	24.45	24.68	17.48	17.54	17.57
ESR 4	32.19	32.97	33.42	18.60	18.71	18.77
ESR 5	41.55	42.65	43.29	20.00	20.17	20.28
ESR 6	27.72	28.36	28.72	17.97	18.05	18.10

** NO_2 concentrations obtained by inputting adjusted predicted road NO_x concentrations into the NO_x to NO_2 calculator in accordance with LAQM.TG(09)*

Scenario 1: Verification and Base Year 2011

B.5.73 The 2011 'baseline' annual mean NO_2 concentrations (corrected) are predicted to range from 23.34 to 41.55µg/m^3 for the six existing sensitive receptor locations considered. Exceedance of the annual mean objective concentration for NO2 (40µg/m^3) is predicted to occur at ESR 5 (9 Oxford Road).

B.5.74 ESR 5 is located at a junction where NO_2 diffusion tube data, for 2011, has shown exceedances of the annual mean objective. Elevated NO_2 concentrations would therefore be expected at this existing sensitive receptor location.

B.5.75 The 2011 'baseline' annual mean PM_{10} concentrations (uncorrected) are predicted to range from 17.40 to 20.00µg/m^3 for the six existing sensitive receptor locations considered. Exceedance of the annual mean objective concentration for PM_{10} (40µg/m^3) is not predicted to occur.

Scenario 2: Opening Year 2017 Without Development

B.5.76 The 2017 'without development' annual mean NO_2 concentrations (corrected) are predicted to range from 23.82 to 42.65µg/m^3 for the six existing sensitive receptor locations considered. Exceedance of the annual mean objective concentration for NO2 (40µg/m^3) is predicted to occur at ESR 5.

B.5.77 The 2017 'without development' annual mean PM_{10} concentrations (uncorrected) are predicted to range from 17.46 to 20.17µg/m^3 for the six existing sensitive receptor locations considered. Exceedance of the annual mean objective concentration for PM_{10} (40µg/m^3) is not predicted to occur.

Scenario 4: Future Year 2022 Without Development

B.5.78 The 2022 'without development' annual mean NO_2 concentrations (corrected) are predicted to range from 24.03 to 43.29µg/m^3 for the six existing sensitive receptor locations considered. Exceedance of the annual mean objective concentration for NO2 (40µg/m^3) is predicted to occur at ESR 5.

B.5.79 The 2022 'without development' annual mean PM_{10} concentrations (uncorrected) are predicted to range from 17.49 to 20.28µg/m^3 for the six existing sensitive receptor locations considered. Exceedance of the annual mean objective concentration for PM_{10} (40µg/m^3) is not predicted to occur.

Impact Assessment

Construction Phase Assessment – Dust Emissions

Step 2

B.5.80 Step 2 of the construction phase dust assessment has been undertaken to determine the potential risk of dust generation and the significance of effects from demolition, earthworks, construction and trackout activities.

B.5.81 To assess the risk, the distance to the closest receptor must be identified and a dust emission class must be chosen for each activity. Emissions are classed as large, medium or small depending on the scale and nature of the works taking place. Examples of the criteria for the dust emission classes are detailed in the IAQM guidance.

B.5.82 The risk category is then determined based on the dust emission class and the distance to the closest receptor, as detailed in Tables B5.8, B5.9 and B5.10.

B.5.83 The assessment procedure assumes no mitigation measures are applied, except those required by legislation. Site specific mitigation measures do not need to be recommended if the risk category is negligible.

Demolition

B.5.84 There are no existing buildings located on the site. No demolition activities will therefore take place prior to earthworks and construction activities. There is no

requirement for an assessment of the potential dust impacts from demolition activities.

Earthworks

Dust Emission Class

B.5.85 Earthworks may be required prior to the construction phase of works. Potential sources of dust during the earthworks phase include:

- Cleaning the site;
- Stripping and stockpiling of topsoil and subsoil;
- Ground excavation;
- Bringing in, tipping and spreading materials on site;
- Stockpiling materials;
- Levelling ground;
- Trenching;
- Road construction;
- Vehicle movements on site roads; and
- Windblown materials from the site.

B.5.86 The total site area is over 10,000 m^2. In accordance with the criteria detailed in the IAQM guidance, the dust emission class is therefore considered large.

Distance to the Nearest Receptors

B.5.87 The nearest receptors are the residential properties located to the west of the site boundary along Bloxham Road and to the north along Foxwood Close, Leawood Close and Jaynes Close, as detailed in Table B5.3. These are located within 10m of the closest site boundary.

Risk Category

B.5.88 Taking into account the dust emission class and the distance of the closest receptors, when earthworks take place at a distance of within 50m of the closest existing sensitive receptors located to the west and north of the southern site boundary, the earthworks will be in the high risk category, in accordance with Table B5.9. Earthworks at a distance of between 50m and 200m from the nearest existing sensitive receptor will be in the medium risk category, and those beyond 200m will be in the low risk category.

B.5.89 As earthworks will take place between less than 50m and over 200m from the nearest receptors, the risk category is considered to be high to low.

Construction

Dust Emission Class

B.5.90 The construction phase will involve the construction of site access roads (including junctions with existing roads), individual building access roads, residential dwellings, the proposed primary school and mixed use units. The construction phase will include approximately 1000 residential dwellings, approximately 5000m^2 of employment floorspace and 1000m^2 of local centre floorspace and a primary school with a total building volume of over 100,000m^3.

B.5.91 Due to the total buildings volume, in accordance with the criteria detailed in the IAQM guidance, the dust emission class is therefore considered large.

Distance to the Nearest Receptors

B.5.92 The nearest receptors are the residential properties located to the west of the site boundary along Bloxham Road and to the north along Foxwood Close, Leawood Close and Jaynes Close, as detailed in Table B5.3. These are located within 10m of the closest site boundary.

Risk Category

B.5.93 Taking into account the dust emission class and the distance of the closest receptors, the construction of residential dwellings at a distance of less than 50m from the nearest receptors will be classed as a high risk, in accordance with Table B5.9. Where the construction of dwellings take places at a distance of between 50m and 200m, this will be classed as a medium risk, and beyond 200m will be in the low risk category.

B.5.94 As residential dwellings are to be constructed will be located between less than 50m and over 200m from the nearest receptors, the risk category is considered to be high to low.

Trackout

Dust Emission Class

B.5.95 Trackout is the transport of dust and dirt by vehicles travelling from a construction site on to the public road network. This may occur through the spillage of dusty materials onto road surfaces or through the transportation of dirt by vehicles that have travelled over muddy ground on the site. This dust and dirt can then be deposited and re-suspended by other vehicles.

B.5.96 At this stage, the number of daily construction phase HGV trips and the exact routing of the construction phase vehicles are not known, as a contractor is yet to be appointed. It is likely however that construction phase vehicles will enter and exit the site via the proposed site access road from the Bloxham Road, to the west of the site.

B.5.97 As the number and routing of construction phase vehicles are not known at this stage, an estimation of the dust emission class has been made based on the size of the site and the distance that may have to be travelled by construction phase vehicles across unpaved ground.

B.5.98 Due to the potential for unpaved roads in excess of 100m from the proposed site access road, in accordance with the criteria detailed in the IAQM guidance, the dust emission class is therefore considered large.

Distance to the Nearest Receptors

B.5.99 To the south, the existing sensitive receptors located within 100m of the construction vehicle route are the existing residential properties along Bloxham Road including Crouch Cottages, The Lodge and The Bungalow. The residential properties near to the junction of Bloxham Road and Wykham Lane are more than 500m away from where vehicles will join the public highway.

B.5.100 To the north, the existing sensitive receptors located within 100m of the construction vehicle route are the residential properties along Lansdown Close and Waller Drive. These are located approximately 400m away from where vehicles will join the public highway; with residential properties located beyond the junction of Bloxham Road and Lansdown Close more than 500m away.

Risk Category

B.5.101 Crouch Cottage, The Bungalow and the closest residential properties on Lansdown Close are located within 20m of the centre of Bloxham Road. Taking into account the dust emission class and the distance of the closest receptors to Bloxham Road, the risk category is considered to be high.

Operational Phase Assessment – Road Traffic Emissions

Existing Sensitive Receptor Locations

B.5.102 The impact assessment has been carried out for the representative existing sensitive receptor locations (ESR 1 to ESR 6). Table B5.18 shows the changes in pollutant concentrations between 2017 opening year and 2022 future year 'without development' and 'with development' scenarios. The uncorrected PM_{10} concentrations are included in Appendix B5.4 and corrected NO2 predicted concentrations are detailed in Appendix B5.5.

Table B5.18 - Predicted NO_2 and PM_{10} Concentrations at Existing Sensitive Receptor Locations for 2017 and 2022 'Without Development' and 'With Development' Scenarios

Receptor	Level of Development	Calculated Annual Mean Concentrations (µg/m^3)			
		NO_2 (Corrected)		PM_{10} (Uncorrected)	
		2017	2022	2017	2022
ESR 1	Without development	23.82	24.03	17.46	17.49
	With development	25.36	25.67	17.76	17.80
	With – without development	*+1.54 µg/m^3*	*+1.64 µg/m^3*	*+0.30 µg/m^3*	*+0.31 µg/m^3*
ESR 2	Without development	29.02	29.33	18.14	18.18
	With development	24.26	24.53	17.40	17.43
	With – without development	*-4.76 µg/m^3*	*-4.80 µg/m^3*	*-0.74 µg/m^3*	*-0.75 µg/m^3*
ESR 3	Without development	24.45	24.68	17.54	17.57
	With development	25.57	25.80	17.77	17.81
	With – without development	*+1.12 µg/m^3*	*+1.12 µg/m^3*	*+0.23 µg/m^3*	*+0.24 µg/m^3*
ESR 4	Without development	32.97	33.42	18.71	18.77
	With development	33.74	34.18	18.90	18.97
	With – without development	*+0.77 µg/m^3*	*+0.76 µg/m^3*	*+0.19 µg/m^3*	*+0.20 µg/m^3*

Receptor	Level of Development	Calculated Annual Mean Concentrations (µg/m^3)			
		NO_2 (Corrected)		PM_{10} (Uncorrected)	
		2017	2022	2017	2022
ESR 5	Without development	42.65	43.29	20.17	20.28
	With development	43.54	43.92	20.42	20.50
	With – without development	*+0.89 µg/m^3*	*+0.71 µg/m^3*	*+0.25 µg/m^3*	*+0.22 µg/m^3*
ESR 6	Without development	28.36	28.72	18.05	18.10
	With development	28.63	28.98	18.11	18.16
	With – without development	*+0.27 µg/m^3*	*+0.26 µg/m^3*	*+0.06 µg/m^3*	*+0.06 µg/m^3*

Scenario 3: Opening Year 2017 'With Development'

B.5.103 The 2017 'with development' annual mean NO_2 concentrations (corrected) are predicted to range from 24.26 to 43.54µg/m^3 for the six existing sensitive receptor locations considered. Exceedance of the annual mean objective concentration for NO2 (40µg/m^3) is predicted to occur at ESR 5 (9 Oxford Road).

B.5.104 ESR 5 is located at a junction where NO_2 diffusion tube data, for 2011, has shown exceedances of the annual mean objective. Elevated NO2 concentrations would therefore be expected at this existing sensitive receptor location.

B.5.105 The 2017 'with development' annual mean PM_{10} concentrations (uncorrected) are predicted to range from 17.40 to 20.42µg/m^3 for the six existing sensitive receptor locations considered. Exceedance of the annual mean objective concentration for PM_{10} (40µg/m^3) is not predicted to occur.

Scenario 5: Future Year 2022 'With Development'

B.5.106 The 2022 'with development' annual mean NO_2 concentrations (corrected) are predicted to range from 24.53 to 44.00µg/m^3 for the six existing sensitive receptor locations considered. Exceedance of the annual mean objective concentration for NO2 (40µg/m^3) is predicted to occur at ESR 5.

B.5.107 The 2022 'with development' annual mean PM_{10} concentrations (uncorrected) are predicted to range from 17.43 to 20.50µg/m^3 for the six existing sensitive receptor

locations considered. Exceedance of the annual mean objective concentration for PM_{10} (40µg/m^3) is not predicted to occur.

Assessment of Significance

Existing Sensitive Receptor Locations

B.5.108 Using the air quality significance criteria, detailed in Section B.4 of this report, the impacts to air quality due to changes in pollutant concentrations can be assessed at the six existing sensitive receptor locations considered.

B.5.109 For 2017 and 2022 for NO_2, four of the six existing sensitive receptor locations considered are predicted to experience a small increase in NO_2 concentrations as a result of the proposed development (i.e. an increase of between 0.4 and 2µg/m^3, in accordance with Table B5.12). ESR 6 (1 Gables Court) is predicted to experience an imperceptible increase (i.e. an increase of less than 0.4µg/m^3) and ESR 2 (2 Crouch Cottages) is predicted to experience a large decrease (i.e. a decrease of more than 4µg/m^3).

B.5.110 The decrease in NO_2 concentrations observed at ESR 2 (2 Crouch Cottages) is due to a change in the alignment of Bloxham Road, with the development in place. The proposed site access will join Bloxham Road at a new roundabout, which will result in traffic being diverted further away from ESR 2.

B.5.111 All existing receptor locations are predicted to experience a negligible impact as a result of the proposed development, in accordance with Table B5.13, with the exception of ESR 2 (2 Crouch Cottages), which is predicted to experience a slight beneficial impact and ESR 5 (9 Oxford Road) which is predicted to experience a slight adverse impact.

B.5.112 The increase in predicted NO_2 concentrations at ESR 5 is classed as small (i.e. there will only be an increase of 0.65µg/m^3 in 2017 and 0.63µg/m^3 in 2022). The predicted concentrations, without the development in place, are 42.65µg/m^3 in 2017 and 43.29µg/m^3 in 2022. As the predicted concentrations are slightly above the annual mean objective without the development in place, this small increase is therefore classed as a slight adverse impact, rather than a negligible impact.

B.5.113 Predicted NO_2 concentrations are below the objective/ limit values for five of the six existing sensitive receptors considered. The only exceedence of the NO_2 annual mean air quality objective of 40µg/m^3 is predicted to occur at ESR 5. As the predicted NO_2 concentrations for the 2017 and 2022 'without development' scenarios are slightly above the annual mean objective, the proposed development does not lead to an exceedance of any of the air quality objectives.

B.5.114 For 2017 and 2022 for PM_{10}, five of the six existing sensitive receptor locations are predicted to experience an imperceptible increase in PM_{10} concentrations as a result of the proposed development (i.e. an increase of less than 0.4µg/m^3, in accordance with Table B5.12). ESR 2 (2 Crouch Cottages) is predicted to experience a small decrease (i.e. a decrease of between 0.4 and 2µg/m^3), due to the realignment of Bloxham Road. All existing receptor locations are therefore predicted to experience a negligible impact as a result of the proposed development, in accordance with Table B5.13.

B.5.115 All predicted PM_{10} concentrations are well below the objective/ limit values and no exceedances of the PM_{10} annual mean air quality objective of 40µg/m^3 are predicted to occur in 2017 and 2022 for both the 'without development' and 'with development' scenarios.

B.5.116 All existing receptor locations are considered moderately sensitive, in accordance with the criteria detailed in Table B5.14. Four of the six receptors considered are predicted to experience a 'negligible/not significant' impact on NO_2 concentrations as a result of the proposed development when the magnitude of impact is considered along with the sensitivity of the receptor, in accordance with Table B5.15.

B.5.117 The exceptions to this are ESR 2 and ESR 5. ESR 2 is predicted to experience 'slight beneficial' impact, due to the large decrease in predicted NO_2 concentrations as a result of the realignment of Bloxham Road. ESR 5 is predicted to experience a 'slight adverse' impact, due to the predicted NO_2 concentrations being slightly above the annual mean objective for both the 'without development' and 'with development' scenarios. However, the increase in NO_2 concentrations in both 2017 and 2022, as a result of the proposed development, is small (i.e. there will only be an increase of between 0.4 and 2µg/m^3) and therefore is not considered to be significant.

B.5.118 All six existing receptor locations considered are predicted to experience a 'negligible/ not significant' impact on PM_{10} concentrations.

B.5.119 All negligible changes in concentrations, between 'without development' and 'with development' scenarios, are explained by slight changes in traffic flows on those roads closest to the receptor locations, with the proposed development in place.

Proposed Sensitive Receptor Locations

B.5.120 Air pollutant concentrations have been modelled for two proposed receptor locations for the 2017 and 2022 'with development' scenarios, as detailed in Table B5.19. The uncorrected PM10 concentrations are included in Appendix B5.4, and the corrected NO2 concentrations are included in Appendix B5.5.

Table B5.19 - Predicted Pollutant Concentrations at Proposed Receptor Points for 2017 and 2022 'With Development' Scenarios

Proposed Receptor Point	Calculated Annual Mean Concentrations (µg/m^3)			
	NO_2 (Corrected)		PM_{10} (Uncorrected)	
	2017	2022	2017	2022
PR 1	34.89	35.28	18.66	18.71
PR 2	24.26	24.48	17.48	17.51

Scenario 3: Opening Year 2017 With Development

B.5.121 The 2017 'with development' annual mean NO_2 concentrations (corrected) are predicted to range from 24.26 to 34.89µg/m^3 for the two proposed sensitive receptor locations considered. Exceedance of the annual mean objective concentration for NO_2 (40µg/m^3) is not predicted to occur.

B.5.122 The 2017 'with development' annual mean PM_{10} concentrations (uncorrected) are predicted to range from 17.48 to 18.66µg/m^3 for the two proposed sensitive receptor locations considered. Exceedance of the annual mean objective concentration for PM_{10} (40µg/m^3) is not predicted to occur.

Scenario 5: Future Year 2022 With Development

B.5.123 The 2022 'with development' annual mean NO_2 concentrations (corrected) are predicted to range from 24.48 to 35.28µg/m^3 for the two proposed sensitive receptor locations considered. Exceedance of the annual mean objective concentration for NO_2 (40µg/m^3) is not predicted to occur.

B.5.124 The 2022 'with development' annual mean PM_{10} concentrations (uncorrected) are predicted to range from 17.51 to 18.71µg/m^3 for the two proposed sensitive receptor locations considered. Exceedance of the annual mean objective concentration for PM_{10} (40µg/m^3) is not predicted to occur.

Mitigation Measures

Construction Phase Assessment – Dust Emissions

Step 3

B.5.125 During the construction phase the implementation of effective mitigation measures will substantially reduce the potential for nuisance dust and particulate matter to be generated.

B.5.126 Step 2 of the construction phase assessment identified that there is a low to high risk category for earthworks and construction activities and a high risk category for trackout. This assumes that no mitigation measures are applied, except those required by legislation. Site specific mitigation measures do not need to be recommended if the risk category is negligible.

B.5.127 As the risk category for these activities are not negligible, site specific mitigation measures will need to be implemented to ensure that dust effects will not be significant.

B.5.128 A best practice dust management plan will be in place for the duration of the construction phase works, which will set out the practical measures to be implemented at the site. The IAQM mitigation measures matrix identifies dust management measures that are considered applicable for low, medium and high risk sites.

B.5.129 All dust and air quality complaints will be recorded and appropriate measures will be taken to identify causes and reduce emissions in a timely manner. Exceptional incidents which cause dust and/or emissions and the action taken to resolve the situation will be recorded in a log book to be made available to the local authority on request.

B.5.130 During the earthworks and construction phases of work, additional measures will be implemented to limit the generation of dust, including:

- Minimisation of the duration of the material handling activity and the amount of handling. Material handling methods will also aim to minimise the generation of airborne dust;
- Protection of surfaces and exposed material from winds until disturbed areas are sealed and stable;
- Ensuring that all vehicles will be sheeted when loaded;
- Dampening down of exposed stored materials, which will be stored as far from sensitive receptors as possible; and
- Avoidance of activities that generate large amounts of dust during windy conditions.

B.5.131 Mitigation measures will also be implemented to reduce the possibility of dust being generated through the trackout of mud and dirt onto the public highway. These will include:

- The control of dust from general traffic at the site during, earthworks and construction works by the provision of a wheel wash at the site exit and a road sweeper for use on site and public highways;
- The provision of easily cleaned hard standing areas for vehicles arriving at and leaving the site and for parking;
- Confining vehicles to areas of the site where appropriate dust control measures can be in operation; and
- Minimisation of vehicle movements and limitation of vehicle speeds – the slower the vehicle speeds, the lower the dust generation.

B.5.132 It is recognised that the final design solutions will be developed with the input of the Contractor to maximise construction efficiencies, to use modern construction

techniques and sustainable materials, and to incorporate the particular skills and experience offered by the successful contractor.

B.5.133 The implementation of effective mitigation measures during the earthworks and construction phase will substantially reduce the potential for nuisance dust and particulate matter to be generated and any residual impact should not be significant.

Operational Phase Assessment – Road Traffic Emissions

Existing Sensitive Receptor Locations

B.5.134 A detailed air quality assessment has been undertaken to consider the potential impact of the proposed development on air quality at six representative existing sensitive receptor locations.

B.5.135 The air quality assessment has predicted that there will be a 'negligible/ not significant' impact on concentrations of NO_2, at four of the six existing receptors considered, in 2017 and 2022 with the development in place. The exception to this is ESR 2 (2 Crouch Cottages) which is predicted to experience a 'slight beneficial' impact on NO_2 concentrations and ESR 5 (9 Oxford Road) which is predicted to experience a 'slight adverse' impact on NO_2 concentrations.

B.5.136 The increase in predicted NO_2 concentrations at ESR 5, as a result of the proposed development, is classed as small (i.e. there will only be an increase of 0.65µg/m^3 in 2017 and 0.63µg/m^3 in 2022). The impact is only described as 'slight adverse' due to predicted NO_2 concentrations at this receptor being slightly above the annual mean objective of 40µg/m^3. The impact of the proposed development at this receptor is not therefore considered to be significant.

B.5.137 The predicted NO_2 concentrations at the other five existing receptor locations are below the annual mean objective of 40µg/m^3.

B.5.138 In addition, the use of current year (i.e. 2011) backgrounds and emissions factors is however considered to be a conservative approach, as it is likely that there will be some improvement in background air quality and emission factors before 2022.

B.5.139 The air quality assessment has also predicted that there will be a 'negligible/ not significant' impact on concentrations of PM_{10}, at all six existing receptors considered, in 2017 and 2022 with the development in place. All predicted PM_{10} concentrations are well below the annual mean objective of 40µg/m^3.

B.5.140 Taking into account the predicted impact of the proposed development, it is not therefore considered necessary to recommend measures to mitigate road traffic emissions.

Proposed Sensitive Receptor Locations

B.5.141 The air quality assessment has also predicted pollutant concentration at two receptor points within the proposed development site. These are considered to be representative of the proposed residential areas closest to the proposed site access and the A361 Bloxham Road.

B.5.142 Predicted NO_2 and PM_{10} concentrations are below the annual mean air quality objectives of 40µg/m_3, for 2017 and 2022, at the proposed sensitive receptor points considered. It is not therefore considered necessary to recommend measures to mitigate road traffic emissions.

Residual Impacts

Construction Phase Assessment – Dust Emissions

Step 4

B.5.143 Step 4 of the construction phase dust assessment has been undertaken to determine the significance of the dust effects arising from the earthworks, construction and trackout associated with the proposed development. The significance is considered with the site specific mitigation measures detailed above.

B.5.144 Once the risk category for each activity has been established, the significance of the impact can be assessed, as detailed in Table B5.11. The significance of the impact takes into account the sensitivity of the local area, using the criteria detailed in Table B5.7.

B.5.145 The sensitivity of the local area surrounding the proposed development has been assessed in accordance with the criteria detailed in Table B5.7. The surrounding area

is considered medium in sensitivity as there are less than 10 existing sensitive receptors located within 20m of the site boundary and the area is in an edge of town location.

Earthworks

B.5.146 The sensitivity of the local area is considered medium and there is a low to high risk of dust effects from earthworks, with the risk diminishing with distance from existing sensitive receptors. The significance of the dust effect for earthworks, with mitigation in place, is classed as negligible, in accordance with the criteria detailed in Table B5.11.

Construction

B.5.147 The sensitivity of the local area is considered medium and there is a low to high risk of dust effects from construction activities, with the risk diminishing with distance from existing sensitive receptors. The significance of the dust effect for construction activities, with mitigation in place, is therefore classed as negligible, in accordance with the criteria detailed in Table B5.11.

Trackout

B.5.148 The sensitivity of the local area is considered medium and there is a high risk of dust effects from trackout. The significance of the dust effect for trackout, with mitigation in place, is therefore classed as negligible, in accordance with the criteria detailed in Table B5.11.

Operational Phase Assessment – Road Traffic Emissions

B.5.149 The air quality assessment indicates that four of the six existing sensitive receptor locations considered are predicted to experience a 'negligible/ not significant' impact in NO_2 concentrations, as a result of the proposed development. All six receptors are expected to experience a 'negligible/ not significant' impact in PM_{10} concentrations, as a result of the development.

B.5.150 ESR 2 is predicted to experience a 'slight beneficial' impact due to the realignment of Bloxham Road with the development in place.

B.5.151 The increase in predicted NO_2 concentrations at ESR 5, as a result of the proposed development, is classed as small (i.e. there will only be an increase of 0.65µg/m^3 in 2017 and 0.63µg/m^3 in 2022). The impact is only described as 'slight adverse' due to predicted NO_2 concentrations at this receptor being slightly above the annual mean objective of 40µg/m^3. The impact of the proposed development at this receptor is not therefore considered to be significant.

B.5.152 In addition, the use of current year (i.e. 2011) backgrounds and emissions factors is however considered to be a conservative approach, as it is likely that there will be some improvement in background air quality and emission factors before 2022.

B.5.153 It has not therefore been necessary to recommend any measures to mitigate pollutant concentrations generated as a result of the proposed development. Therefore the residual impacts will remain negligible and unchanged.

Cumulative Impacts

B.5.154 The traffic flow information, provided by the appointed transport consultant for use in the air quality assessment, includes the consideration of committed developments within the vicinity of the proposed development.

B.5.155 The results of the air quality assessment show that there will be a 'negligible/ not significant' impact on NO_2 concentrations at four of the six existing receptor locations considered and on PM_{10} concentrations at all six existing sensitive receptors.

B.5.156 ESR 2 is predicted to experience a 'slight beneficial' impact due to the realignment of Bloxham Road with the development in place.

B.5.157 The increase in predicted NO_2 concentrations at ESR 5, as a result of the proposed development, is classed as small (i.e. there will only be an increase of 0.65µg/m^3 in 2017 and 0.63µg/m^3 in 2022). The impact is only described as 'slight adverse' due to predicted NO_2 concentrations at this receptor being slightly above the annual mean objective of 40µg/m^3. The impact of the proposed development at this receptor is not therefore considered to be significant.

B.5.158 The cumulative impacts of committed developments in the vicinity of the proposed development are not therefore considered to be significant.

Conclusions

Construction Phase Assessment – Dust Emissions

B.5.159 The construction phase assessment has been undertaken to determine the risk and significance of dust effects from earthworks, construction activities and trackout from the proposed development. The assessment has been undertaken in accordance with the guidance on assessing the impacts of construction phase dust published by the Institute of Air Quality Management.

B.5.160 The risk of dust effects is considered to be a low to high risk category (depending on distance from receptors) for earthworks and construction activities and a high risk category for trackout. Site specific mitigation measures will therefore need to be implemented at the site.

B.5.161 The significance of the dust effects has been assessed by taking into account the sensitivity of the local area and the risk that the activities might give rise to dust effects. The local area is considered to be of medium sensitivity. With the site specific mitigation measures outlined in Section B5.7 in place, the significance of dust effects for earthworks, construction and trackout are considered to be negligible.

Operational Phase Assessment – Road Traffic Emissions

Existing Sensitive Receptor Locations

B.5.162 Air quality at six representative existing sensitive receptor locations has been considered in the air quality assessment. The existing receptor locations are all considered to be moderately sensitive in accordance with the criteria detailed in the Assessment of Significance of this Chapter.

B.5.163 For 2017 and 2022 for NO_2, four of the six existing receptors considered show a 'negligible/ not significant' impact as a result of the proposed development, in accordance with the significance criteria detailed in the Assessment of Significance. ESR 2 (2 Crouch Cottages) is predicted to experience a 'slight beneficial' impact as a result of the proposed development. ESR 5 (9 Oxford Road) is predicted to experience a 'slight adverse' impact as a result of the proposed development.

B.5.164 The increase in predicted NO_2 concentrations at ESR 5 is classed as small (i.e. there will only be an increase of 0.65µg/m^3 in 2017 and 0.63µg/m^3 in 2022). The predicted concentrations, without the development in place, are 42.65µg/m^3 in 2017 and 43.29µg/m^3 in 2022. As the predicted NO2 concentrations at this receptor are slightly above the annual mean objective without the development in place, the small increase is therefore classed as a 'slight adverse' impact, rather than a negligible impact. However, given that the increase is so small, the impact of the proposed development at ESR 5 is not considered to be significant.

B.5.165 Predicted NO_2 concentrations are below the objective/ limit values for five of the six existing sensitive receptors considered. The only exceedence of the NO_2 annual mean air quality objective of 40µg/m^3 is predicted to occur at ESR 5. As the predicted NO_2 concentrations for the 2017 and 2022 'without development' scenarios are slightly above the annual mean objective, the proposed development does not lead to an exceedance of any of the air quality objectives.

B.5.166 In addition, the use of current year (i.e. 2011) backgrounds and emissions factors is however considered to be a conservative approach, as it is likely that there will be some improvement in background air quality and emission factors before 2022.

B.5.167 For 2017 and 2022 for PM_{10}, all six existing receptors considered show a 'negligible/ not significant' impact as a result of the proposed development, in accordance with the significance criteria detailed in Assessment of Significance of this Chapter.

B.5.168 No exceedences of the PM_{10} annual mean air quality objective of 40µg/m^3 are predicted to occur in 2017 and 2022 for both the 'without development' and 'with development' scenarios.

B.5.169 To summarise, the air quality assessment indicates that the proposed development generated traffic will have a negligible impact on the majority of existing sensitive receptor locations in both 2017 and 2022. The impact at ESR 2 is considered to eb 'slight benefial' due to the realignment of Bloxham Road. Although the impact on NO2 concentrations at ESR 5 is classed as 'slight adverse', the increase with the development in place is so small that it is not considered to be significant. It is not

therefore considered necessary to recommend measures to mitigate road traffic emissions.

Proposed Sensitive Receptor Locations

B.5.170 The air quality assessment also predicted pollutant concentrations at two proposed sensitive receptor points within the proposed development.

B.5.171 NO_2 and PM_{10} concentrations are predicted to be below the respective annual mean air quality objectives, for 2017 and 2022, at the proposed sensitive receptor points considered. It is not therefore considered necessary to recommend measures to mitigate road traffic emissions.

B.6 NOISE AND VIBRATION

Introduction

B.6.1 This chapter assesses the noise and vibration impacts of the proposed development. It considers the potential impacts generated by the earthworks, construction phase and operational phase of the proposed development. The site is proposed for mixed used. There is therefore the potential for both sensitive uses (such as residential properties, primary school and offices) and noise generating uses (such as warehousing and distribution) to exist on the same site.

B.6.2 The chapter describes the methods used to assess the baseline conditions currently existing at the site and surroundings; the potential impacts of the development arising from construction activities, additional traffic movements to and from the site, and proposed noise sources, at existing noise sensitive locations; the impact of existing and future noise sources on sensitive areas of the proposed development; the mitigation measures required to prevent or reduce the impacts and the residual impacts.

B.6.3 This chapter should be read in conjunction with Section A2 of this Environmental Statement (ES), which give details of the site location, and development works to be undertaken at the site, respectively.

Assessment Methodology

Consultation and Scope of Works

B.6.4 The assessment considers the following potential impacts associated with the proposed development:

- Construction Phase: Impact of noise and vibration, from the earthworks and construction of the development on sensitive receptors;
- Operational Phase – Road Traffic Noise and Existing Sensitive Receptors: Impact of noise on sensitive receptors due to development generated traffic using the existing road network;
- Operational Phase Assessment – Proposed sensitive receptors and noise: It has been necessary to consider the noise levels at noise sensitive areas of the proposed development, i.e. proposed residential areas and school site; and
- Operational Phase Assessment – Proposed Noise sources and Proposed and Existing Sensitive Receptors : It has been necessary to consider the to assess

the noise from proposed offices and commercial/retail uses (B1/B2, A1, A3-A5), community uses (D1) and assembly and leisure uses (D2) on the proposed residential uses at Wykham Park Farm and at existing residential locations.

Construction Phase Assessment

Noise from Earthworks and Construction Phase Activities

B.6.5 The activities associated with the earthworks and construction phase of the proposed development will have the potential to generate noise and create an impact on the surrounding area.

B.6.6 Guidance on the prediction and assessment of noise from development sites is given in British Standard 5228 -1:2009 "Code of Practice for noise and vibration control on construction and open sites – Part 1: Noise" (BS5228-1).

B.6.7 Construction noise can have disturbing effects on the surrounding neighbourhood. The effects are varied and are complicated further by the nature of the site works, which will be characterised by noise sources which will change location throughout the construction period. The duration of site operations is also an important consideration. Higher noise levels may be acceptable if it is known that the levels will occur for a limited period.

B.6.8 For the purposes of this assessment, the occupants of existing residential properties in the vicinity of the site are considered to be the receptors most likely to be affected by the construction phases of the development. Details of the receptors are set out in Table B6.1.

Table B6.1 - Existing Noise Sensitive Receptor Locations

Receptor	Address	Bearing from Site	Approximate Distance to Site Boundary
ESR1	Crouch Cottages, Bloxham Road (A361)	West	20m
ESR2	Banbury School, Ruskin Road	North	20m
ESR3	Residential Estate (west of A4260)	North East	10m
ESR4	Wykham Farm Cottage, Wykham Lane	South East	5m
ESR5	Wykham Park Farm Cottage, Wykham Lane	South West	50m

B.6.9 Local authorities may also have their own procedures for control of construction activities that are proposed in their catchment area. Cherwell District Council (CDC) recommends that where work can be heard beyond the site boundary, that this does not commence before the hours of 08.00 and does not carry on beyond the hours of 18.00 Monday to Friday. CDC suggests that work does not commence on a Saturday before 08.00 hours and ceases at 13.00 hours and that no work takes place on Sundays or public holidays. CDC does not specify any noise limits.

B.6.10 In the absence of any procedures for the control of construction activities, the Control of Pollution Act 1974 (COPA 1974) gives the local authority power to serve a notice under Section 60 imposing requirements as to the way in which works are to be carried out. This could specify times of operation, maximum levels of noise which should be emitted and the type of plant which should or should not be used.

B.6.11 Under Section 60 of the COPA 1974 Act the local authority has the power to serve a notice which could impose requirements as to the way in which works are to be carried out. This could specify times of operation, maximum levels of noise which should be emitted and the type of plant which should or should not be used. This is a common way of enforcing reasonable levels of construction noise.

B.6.12 However it might be preferable for the chosen contractor to obtain prior consent under Section 61 of COPA 1974. Section 61 - enables anyone who intends to carry out works to apply to the local authority for consent. Under Section 61 the local authorities and those responsible for construction work have an opportunity to settle any problems, relating to the potential noise, before work starts.

B.6.13 In addition to COPA 1974, BS5228-1 provides guidance on significance criteria for assessing the potential noise impacts associated with the construction phase of large projects. For the purposes of this noise assessment, the noise likely to be generated by the earthworks and construction phase have been assessed against significance criteria established, using the BS5228-1 ABC Method.

B.6.14 The ABC method for determining significance criteria requires the ambient noise levels at existing sensitive receptors to be determined. The ambient noise levels at each existing receptor location are then rounded to the nearest 5dB(A) to determine

the appropriate threshold value in accordance with the category value, A B or C, as detailed in Table B6.2.

B.6.15 The noise level likely to be generated at the receptor during the construction phase, i.e. the ambient noise level plus construction noise, is then compared to the appropriate category value. If the noise level is greater than the appropriate category value, a significant noise impact may be registered.

Table B6.2 - Thresholds of Significant Impact from Construction Noise at Residential Receptors in accordance with the ABC Method of BS5228-1

Assessment Category and Threshold Value Period (LAeq)	Threshold Value, in decibels (dB)		
	Category A *1	Category B *2	Category C *3
Daytime (0700 to 1900 hours) and Saturdays (0700 to 1300 hours)	65	70	75
*1 Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than this value.			
*2 Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Category A values.			
*3 Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Category A values.			

B.6.16 At this stage, the contractor to undertake the enabling and construction works is not known. However, it is considered that the enabling and construction works are likely to be restricted to daytime hours, i.e. between 0800 and 1800 hours Monday to Friday and 0800 to 1300 hours on a Saturday. Based on the ambient noise levels measured during the daytime period, the appropriate category value has been determined for each of the sensitive receptors detailed in Table B6.1. Details of the noise survey carried out at the sensitive receptors are set out in Appendix B6.2.

Table B6.3 - Construction Noise Assessment Significance Criteria

Receptor	Average Measured Noise Levels (dB $L_{Aeq\ 20\ minutes}$)	Ambient Noise Level Rounded to the nearest 5dB(A) (dB $L_{Aeq\ 20\ minutes}$)	Appropriate Category Value A, B or C in accordance with BS5228-1	Noise Level above which activities of the Construction Phase may cause a significant impact at the Receptor (dB L_{Aeq})
ESR1	59.0	60.0	A	65.0
ESR2	48.0	50.0	A	65.0
ESR3	47.7	50.0	A	65.0
ESR4	45.1	45.0	A	65.0
ESR5	48.0	50.0	A	65.0

B.6.17 The noise assessment for the construction phase details baseline daytime noise levels recorded at sensitive receptor locations and outlines the main construction activities that could give rise to noise impacts at receptors in the vicinity of the proposed development. It also sets out details of 'best practice' management and control measures to ensure that impacts are minimised as far as possible.

Noise from Construction Vehicles

B.6.18 In addition to the earthworks and construction activities, vehicle movements to and from the proposed development have the potential to generate noise at existing sensitive receptors, in the immediate vicinity of the local road network.

B.6.19 At this stage, detailed traffic data relating to the likely numbers of construction vehicles is not available. However, the number of construction vehicles is not considered to be significant relative to the existing flows on the major road links within and surrounding the development site. It is therefore considered that the level of road traffic noise at sensitive receptor locations will not change significantly, due to construction vehicles during the construction phases of the development, and this impact has not there been considered further.

Vibration from Earthworks and Construction Phase Activities

B.6.20 Work involving heavy plant on an open site is likely to generate vibration, which may, in certain circumstances, propagate beyond the boundary of the site. In situations where particularly heavy plant, vibrating compaction equipment or piling rigs are

being used close to the site boundary, nearby properties may experience ground-borne vibration.

B.6.21 Guidance on the assessment of vibration from development sites is given in British Standard 5228 -2:2009 "Code of Practice for noise and vibration control on construction and open sites – Part 2: Vibration" (BS5228-2).

B.6.22 The sensitive receptors most likely to be affected by vibration generated by the earthworks and construction phase works of the development are detailed in Table B6.1.

B.6.23 It is not possible to mitigate vibration emissions from an open site. It is important therefore to examine the proposed working method to ascertain what, if any, operations would be likely to cause unacceptable levels of vibration at nearby sensitive locations. It is possible that these operations could be modified to reduce their vibration impacts.

B.6.24 BS5228-2 2009 indicates that vibration can have disturbing effects on the surrounding neighbourhood; especially where particularly sensitive operations may be taking place. The significance of vibration levels which may be experienced adjacent to a site is dependent upon the nature of the source.

B.6.25 Human perception of vibration is extremely sensitive. People can detect and be annoyed by vibration before there is any risk of structural damage. Cases where damage to a building has been attributed to the effects of vibration alone are extremely rare; even when vibration has been considered to be intolerable by the occupants.

B.6.26 It is not possible to establish exact vibration damage thresholds that may be applied in all situations. The likelihood of vibration induced damage or nuisance will depend upon the nature of the source, the characteristics of the intervening solid and drift geology and the response pattern of the structures around the site. Most of these variables are too complex to quantify accurately and thresholds of damage, or nuisance, are therefore conservative estimates based on a knowledge of engineering.

B.6.27 Where ground vibration is of a relatively continuous nature, there is a greater likelihood of structural damage occurring, compared to transient vibration; for example that caused by transiting vehicles.

B.6.28 BS5228-2 indicates that the threshold of perception is generally accepted to be between a peak particle velocity (PPV) of 0.14 and 0.3mm/sec. In an urban situation it is unlikely that such vibration levels would be noticed. The Highways Agency Research report No. 53 "Ground Vibration caused by Civil Engineering Works" 1986 suggests that, when vibration levels from an unusual source exceed the human threshold of perception, complaints may occur. The onset of complaints due to continuous vibration is probable when the PPV exceeds 3mm/sec.

B.6.29 British Standard BS6472: 2008 "Guide to Evaluation of human exposure to vibration in buildings. Part 1: Vibration sources other than blasting" (BS6472-1) suggests that adverse comments or complaints due to continuous vibration are rare in residential situations below a PPV of 0.8mm/sec.

B.6.30 Continuous vibration is defined as "vibration which continues uninterrupted for either a daytime period of 16 hours or a night-time period of 8 hours". The proposed earthworks and construction works at the site will not cause continuous vibration as defined in BS6472-1.

B.6.31 BS5228-2 2009 suggests that the onset of cosmetic damage is 15mm/sec (15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz for residential or light commercial type buildings).

B.6.32 The adverse residual impacts are assessed against the categories set out in Table B6.4.

Table B6.4 - Construction Vibration Assessment Significance Criteria

Magnitude of Impact	Criteria for Assessing Construction Vibration impact
Major Adverse	> 10mm per sec. Vibration likely to be intolerable for more than brief exposure. Approaching the level at which cosmetic damage may occur in light structures.

Magnitude of Impact	Criteria for Assessing Construction Vibration impact
Moderate Adverse	5mm - 10mm per second. Tolerance less likely even with prior warning and explanation.
Minor Adverse	1mm – 5mm per second. Complaints are likely, but can be tolerated if prior warning and explanation given.
Negligible	<1mm per second. Below level at which complaints are likely.

B.6.33 The vibration assessment for the construction phase outlines the main construction activities that could give rise to vibration impacts at receptors in the vicinity of the proposed development. It also sets out details of 'best practice' management and control measures to ensure that impacts are minimised as far as possible.

Operational Phase Assessment

Road Traffic Noise and Existing Sensitive Receptors

B.6.34 The operational phase of the development will generate additional traffic movements on the existing road network. These additional vehicle movements have the potential to increase road traffic noise levels at existing receptors located adjacent to the main routes to and from the development.

B.6.35 The current and future traffic noise levels at a number of sensitive receptors; both with and without the development in place, have been predicted using the computer modelling software SoundPLAN Version 7.1. The computer modelling methodology conforms to the calculation procedures set out in the Department of Transport's memorandum, "Calculation of Road Traffic Noise" (CRTN), 1988. The memorandum was prepared to enable entitlement under the Noise Insulation Regulations 1975 to be determined; but it is stated in the document, that the guidance is equally appropriate for the calculation of traffic noise for land use planning purposes.

B.6.36 The procedures outlined in CRTN assume typical traffic and noise propagation conditions that are consistent with moderately adverse wind velocities and directions during specified periods. In CRTN, all noise levels can be expressed in terms of the index $L_{10\ (18\ hour)}$ dB(A).

B.6.37 The data used in the road traffic noise assessment is detailed in the Transport Assessment (TA) produced by Savell Bird & Axon (SBA) the traffic and transportation

consultant for the proposed development. Further details of the TA are contained in chapter B4 of this ES.

B.6.38 The noise assessment requires 18-hour traffic flows for the routes likely to be affected by development traffic. The traffic information has been derived from traffic counts and has been provided as 18 hour AAWT flows and HGV percentages. The flows used in the noise assessment are included in Appendix B6.1.

B.6.39 In summary, CRTN has been used to determine the noise levels at each existing sensitive receptor, for a total of 4 scenarios:

- Scenario 1: 2017 Proposed Opening Year, Without the Development in Place, i.e. Future Baseline + Committed Development Traffic;
- Scenario 2: 2017: Proposed Opening Year, With the Development (with residential dwellings in place), i.e. Future Baseline + Committed Development Traffic + Application Development Traffic;
- Scenario 3: 2022 Future Assessment Year, Without the Development in Place, i.e. Future Baseline + Committed Development Traffic; and
- Scenario 4: 2022 Future Assessment Year, With the Development, i.e. Future Baseline + Committed Development Traffic + Application Development Traffic

B.6.40 Details of the sensitive receptor locations are given in Table B6.5 and shown on Figure B6.1.

Table B6.5 - Existing Noise Sensitive Receptor Locations Considered for CRTN Predictions

CRTN Receptor Number	Address	Approximate Grid Reference	
		X	Y
CRTN1	2 Crouch Cottages	444173.00	238753.00
CRTN2	2 Lansdown Close	444525.00	239099.00
CRTN3	123 Bloxham Road	444963.00	239543.00
CRTN4	The Bungalow, Bloxham Road	444005.00	238378.00

B.6.41 Impacts will also be felt at receptors adjacent to and beyond those listed above. However, impacts at these receptors will be no greater than the listed receptors.

B.6.42 The changes in road traffic noise levels have been assessed against a set of significance criteria. The criteria shown in Table B6.6 are based upon guidance

contained within the Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7, 2011 (DMRB) for the assessment of long term changes in road traffic noise. The criteria do not relate to the actual existing noise levels (i.e. traffic noise due to the current development) but only the predicted changes.

Table B6.6 - Road Traffic Noise Assessment Significance Criteria

Magnitude of Impact	Criteria for Assessing Road Traffic Noise
Major Adverse	> 10.0 dB increase in traffic noise (equating to a doubling in the loudness of noise).
Moderate Adverse	5.0 – 9.9 dB increase in traffic noise (equating to a clearly perceptible increase in the loudness of noise).
Minor Adverse	3.0 – 4.9 dB increase in traffic noise increase in traffic noise (equating to an increase in the loudness of the noise which is at or about the threshold of perception).
Negligible	0.1 – 2.9 dB increase in traffic noise. No perceptible increase in traffic noise.

Existing Sensitive Receptors and Vibration

B.6.43 It is considered that the operational phase of the development is unlikely to produce any significant groundborne vibration. Vibration from the operation of the completed development has not therefore been considered.

Proposed Sensitive Receptors (Wykham Park Farm) and Noise

B.6.44 In addition to assessing the noise impact of the development at existing receptors, an assessment is required to consider any potentially noise sensitive areas of the proposed development. These areas, i.e. residential dwellings and school site, will be subjected to noise from existing and proposed sources.

B.6.45 The dominant source of existing noise at the proposed development is road traffic from vehicles travelling along Bloxham Road (A361), adjacent to the development site. There will also be some additional noise from traffic generated by the development itself and some noise from the operation of the offices. To determine the existing noise levels, at the proposed sensitive areas of the development, attended noise surveys have been carried out. Details of the noise survey are summarised in Section B6.68 of this chapter and set out in full in Appendix B6.2.

B.6.46 Once operational, the proposed development site will generate additional traffic movements on the local road network. These additional vehicle movements have the potential to increase road traffic noise at the proposed residential areas of the site. The future traffic noise levels across the site; both with and without the development in place, have been predicted using the computer modelling software SoundPLAN version 7.1. The computer modelling methodology conforms to the calculation procedures set out in CRTN.

B.6.47 In accordance with CRTN, the modelled noise levels can be expressed in terms of the index LA10. The results of the noise modelling can be compared to current planning guidance by making small adjustments to the modelled noise levels, in accordance with a method set out in the former "Planning Policy Guidance Note 24: Planning and Noise", 1994 (PPG24). The LA_{10} can be converted to an $L_{Aeq\ 16hour}$ (dB) (as required by current planning guidance) by subtracting 2dB(A).

B.6.48 The noise assessment for the operational phase therefore details existing and future noise levels across the proposed development. These noise levels have been assessed, and, where necessary, mitigation measures have been recommended to ensure that the required external and internal noise levels are met.

Proposed Residential Areas

Noise Policy Statement for England, 2010

B.6.49 The potential impacts of the existing and future sources of noise at the proposed residential areas of the proposed development have been assessed in accordance with the Noise Policy Statement for England (NPSE) March 2010 as required by the National Planning Policy Framework.

B.6.50 The NPSE discusses noise impacts in accordance with concepts established by the World Health Organisation. NPSE does not set specific adverse effect levels in order to provide for the necessary policy flexibility.

B.6.51 However, in the absence of absolute levels, it is considered appropriate to assess noise levels across the developed in accordance with the World Health Organisation's "Guidelines for Community Noise", 1999.

World Health Organisation Guidelines for Community Noise, 1999:

B.6.52 The World Health Organisation's "Guidelines for Community Noise", 1999 (WHO 1999) suggest appropriate criteria and noise limits for outdoor living areas and habitable rooms of residential dwellings. In accordance with the requirements of the WHO 1999, the following external and internal noise limits, for noise from external sources, will need to be met within sensitive areas of the residential dwellings:

- 55dB $L_{Aeq\ (16\ hour)}$ during the daytime in outdoor living areas;
- 35dB $L_{Aeq\ (16\ hour)}$ during the daytime in noise sensitive rooms other than bedrooms;
- 30dB $L_{Aeq\ (8\ hour)}$ during the night-time in bedroom areas.
- 45dB L_{AMAX} should not be exceeded during the night-time in bedroom areas.

British Standard 4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas (BS4142):

B.6.53 Where industrial noise is dominant, BS4142 is used to assess the impact of the noise. Therefore, in addition to the assessment in accordance with WHO 1999, a BS4142 assessment has been carried out to consider the potential noise impact of existing industrial premises, on residential areas of the development.

B.6.54 The purpose of the BS4142 assessment procedure is to assess whether noise levels from factories, industrial premises, fixed installations or sources of noise of an industrial nature in commercial premises, are likely to give rise to complaints from people residing nearby.

B.6.55 BS4142 refers to noise from the industrial source as the 'specific noise'. BS4142 assesses the likelihood of complaint by comparing the specific noise level to the background noise level (LA90)

B.6.56 Certain acoustic features can increase the likelihood of complaints over that expected from a simple comparison between the specific noise level and the background noise level. In particular BS4142 identifies noise that contains discrete impulses and/or audible tonal qualities and in these cases recommends that a 5dB correction be added to the specific noise level. The specific noise level along with any applicable correction is referred to as the 'rating level'.

B.6.57 The greater the difference between the rating level and the background noise level, the greater the likelihood of complaints. The assessment criteria given by BS4142 are as follows:

- A difference of +10dB indicates that complaints are likely.
- A difference of +5dB is of marginal significance.
- If the rating level is more than 10dB below the measured background noise level, this is a positive indication that complaints are unlikely.

B.6.58 During the daytime, BS4142 requires that noise levels are assessed over 1-hour periods. However, during the night-time, because sleep disturbance is the important issue and individual noise events are, therefore, more important, noise levels are assessed over 5-minute periods.

Proposed Primary School Site

B.6.59 The potential impacts of the existing and future sources of noise at the proposed primary schools sites have been assessed with reference to "Building Bulletin 93: Acoustic Design in Schools" (BB93). BB93 provides detailed guidance on recommended external and internal noise levels to be achieved at school development sites.

B.6.60 For new school developments, BB93 recommends that the following daytime noise levels should be achieved:

- An upper limit of 60 dB $L_{Aeq\ (30\ minutes)}$ at the boundary of external premises used for teaching and recreation.
- 55 dB $L_{Aeq\ (30\ minutes)}$ in unoccupied playgrounds, playing fields and other outdoor areas.
- 50 dB $L_{Aeq\ (30\ minutes)}$ in at least one area of the unoccupied playgrounds, playing fields and other outdoor areas, to ensure suitable noise levels for outdoor teaching.
- Indoor ambient noise limits in schools of between 30 and 40 dB $L_{Aeq\ (30\ minutes)}$ depending on the use of the room.

Proposed Employment

B.6.61 At this stage detailed information relating to the future occupants and associated activities at the proposed employment area is not available. However noise

mitigation will be implemented at proposed office areas of the development to ensure that acceptable noise levels are achieved.

B.6.62 In accordance with BS8233:1999 'Sound insulation and noise reduction for buildings – Code of practice' the mitigation will be implemented to achieve 35-40 dB L_{Aeq} in office areas depending on the proposed end use of the area. Detailed recommendations for mitigation can be made once the detailed design of the proposed units is known.

Proposed Sensitive Receptors and Vibration

B.6.63 It is considered that the levels of vibration will not significantly affect the proposed sensitive areas of the development. Vibration from the operation of the completed development has not therefore been considered.

B.6.64 It is considered that the levels of vibration at the development site will not significantly affect the proposed sensitive areas of the development i.e. any office areas. Vibration from the operation of the completed development has not therefore been considered.

Baseline

Baseline Road Traffic Noise Levels at Sensitive Receptors

B.6.65 In accordance with the method specified in CRTN, noise modelling has been carried out for the 4 receptors identified in Table B6.5 and shown on Figure B6.1 (i.e. CRTN1 to CRTN4). The noise modelling indicates the baseline noise levels at the façade of each receptor, in 2017 and 2022. The noise modelling results are shown in Table B6.7.

Table B6.7 - Results of the Predicted Baseline Road Traffic Noise Levels

CRTN Receptor Number	Predicted $L_{10\ 18hour}$ dB(A) at the façade of the Receptor – 2017(Scenario 1)	Predicted $L_{10\ 18hour}$ dB(A) at the façade of the Receptor – 2022 (Scenario 3)
CRTN1- 2 Crouch Cottages	70.6	70.6
CRTN2 - 2 Lansdown Close	69.2	69.2
CRTN3 - 123 Bloxham Road	68.9	69.0
CRTN4 - The Bungalow, Bloxham Road	68.1	68.1

B.6.66 In accordance with CRTN, the predicted level of road traffic noise at the façade of the existing receptors has been determined based on the number and composition of vehicles travelling along the local road links (i.e. the number and proportion of HGVs and LGVs), together with the speed of vehicles, distance of the receptor from the edge of the carriageway and angle of view of the road link. Further details of the CRTN modelling assumptions are included in Appendix B6.1.

Baseline Survey Information

B.6.67 In September 2012, Wardell Armstrong LLP carried out a noise survey to assess the noise levels across the proposed Wykham Park Farm development site and at existing sensitive receptor locations.

B.6.68 Noise measurements were carried out at 5 monitoring locations, considered to be representative of the existing and proposed residential receptors in the immediate vicinity of the proposed Wykham Park Farm development.

B.6.69 Monitoring locations 1 to 5 are also relevant to the Wykham Farm Park assessment of construction noise. The monitoring locations are shown on Drawing Number B6.1:

- Monitoring Location 1: Located approximately 10m from the carriageway of the A361 (Bloxham Road). This monitoring location is also used for Crouch Cottages for the construction phase assessment.
- Monitoring Location 2: In the northwestern part of the proposed development site. This on-site monitoring location is considered to be representative of the existing Banbury School north of the saltway for the construction phase assessment;
- Monitoring Location 3: In the northeastern part of the proposed development site. This on-site monitoring location is considered to be representative of the existing properties in the residential area to the north east for the construction phase assessment;
- Monitoring Location 4: In the southeastern part of the proposed development site. This on-site monitoring location is considered to be representative of the existing residential receptor, Wykham Farm Cottage, for the construction phase assessment; and
- Monitoring Location 5: In the southwestern part of the proposed development site. This on-site monitoring location is considered to be

representative of the existing residential receptor, Wykham Park Farm Cottage, for the construction phase assessment.

B.6.70 The full results and details of the monitoring are included in Appendix B6.2.

B.6.71 The daytime and night-time noise measurements have been arithmetically averaged to give a single daytime and night-time level for each location and these are shown in Table B6.8. In accordance with the shortened measurement procedures specified in CRTN, the measured daytime noise level at monitoring location 1 i.e. in the immediate vicinity of the A361, has been adjusted to predict the daytime level of road traffic noise at this location.

Table B6.8 - Average Daytime and Night-time Noise Monitoring Results (Figures in dB L_{Aeq})

Monitoring Location	Time	Average Measured Noise Levels
1	0700-2300	59.0
	2300-0700	51.6
2	0700-2300	48.0
	2300-0700	33.3
3	0700-2300	47.7
	2300-0700	32.8
4	0700-2300	45.1
	2300- 0700	33.5
5	0700-2300	48.0
	2300 - 0700	37.3

* Daytime noise levels calculated in accordance with the shortened measurement procedure in CRTN 1988.

B.6.72 In addition to the average daytime and night-time noise levels, the range of maximum noise level recorded during each measurement period of the night-time survey, at monitoring locations 1 to 5, are summarised in Table B6.9.

Table B6.9 - Maximum Night-time Noise Levels

Monitoring Location	Range of Maximum Measured Noise Levels (Figures in dB LAmax)
1	66.6 – 68.8
2	49.1 – 67.0
3	53.2 – 60.6
4	47.3 – 66.1
5	49.5 – 61.5

B.6.73 Table B6.8 shows that the noise levels in the western part of the site, located nearest to the A361, exceed the required daytime noise limit of 55dB LAeq 16 hour. The existing noise levels at the proposed development should not therefore be a determining factor in granting planning permission; however, mitigation measures are needed to be considered to achieve the noise levels required in garden areas and noise sensitive rooms.

Modelled Road Traffic Noise Levels for Future Years

B.6.74 In addition to the noise survey, noise modelling has been carried out to determine the daytime levels of road traffic noise across the site for the future years of 2017 and 2022, i.e. with committed development traffic in place. The results of the SoundPLAN daytime noise modelling is shown on Figures B6.2 and B6.3 respectively. The results of the noise modelling indicate that the noise levels in the western part of the site, located nearest to the A361, exceed the required daytime noise limit of 55dB LAeq 16 hour. Therefore, mitigation measures will need to be considered to achieve the noise levels required in garden areas and noise sensitive rooms.

Potential Impacts

Construction Phase Assessment

Noise from Earthworks and Construction Phase Activities

B.6.75 During the earthworks and construction phase, any work carried out at the proposed development is likely to generate noise that may propagate beyond the proposed development boundary.

B.6.76 At this stage the nature and timescales of activities likely to take pace during the earthworks and construction phase are not known. Activities on the site, which could give rise to construction noise impacts include (but are not limited to):

- Site preparation i.e. ground excavation, levelling of ground, trenching, trench filling, unloading and levelling of hardcore and compacting filling; and
- Construction of the proposed redevelopment including piling, construction of access roads, fabrication processes e.g. planing, sanding, routing, cutting, drilling and laying foundations.

B.6.77 The levels of noise received at the receptors closest to the proposed development due to the activities above would depend on the sound power levels of the machines used, the distance to the properties, the presence of screening or reflecting surfaces and the ability of the intervening ground to absorb the propagating noise.

B.6.78 The nearest noise sensitive receptors to the development boundary, as detailed in Table B6.1 will vary depending on the phase of the development under construction. Given the potentially small distances between construction activities and residential dwellings noise levels at the receptors may occur above those detailed in Table B6.3. The noise generated by the earthworks and construction phases of the development may therefore have short term, adverse impact at the sensitive receptors located in the immediate vicinity of the construction phases of the development.

B.6.79 It is therefore recommended that standard mitigation measures be put in place to minimise potential impacts. Details can be found in paragraphs B6.108 to B6.110 of this chapter.

Vibration from Earthworks and Construction

B.6.80 The earthworks and construction works have the potential to increase vibration levels at residential properties in the vicinity of construction phases of development during the proposed working hours.

B.6.81 Wardell Armstrong's archives contain field trial measurements of ground vibration associated with types of plant likely to be used at the proposed development. The representative, measured levels, made by Wardell Armstrong using a Vibrock B801 Digital Seismograph, are set out in Table B6.10.

Table B6.10 - Measured Vibration Levels of Plant Under normal Operating Conditions (Figures in ppv mm per second)

Plant Type	Distance from Source		
	10m	20m	30m
25-30 tonne excavator	0.175	0.075	Background
25 tonnes dumptruck (Volvo A25) Loaded Empty	 1.000 0.225	 0.150 0.050	 Background Background
Dozer	1.050	0.400	Background
Vibrating roller Drum Vibrator on Vibrator off	 4.470 0.500	 3.270 0.150	 2.350 0.050
Loading shovel	1.025	0.150	Background

B.6.82 The nearest sensitive properties to the proposed construction works, as detailed in Table B6.1 of this chapter, will vary depending on the phase of the development under construction. As a worst case scenario, earthworks and construction works may potentially take place at a distance of approximately 5 metres from existing and proposed residential properties.

B.6.83 At this distance, it is possible that vibration due to the operation of various construction plant, and in particular a vibratory roller, may be above the threshold of complaint. However, the vibration levels are highly unlikely to be above the threshold of structural damage. It is possible that residential properties would therefore potentially experience a minor adverse impact. However this would occur for only limited periods during the works, i.e. when activities take place at the development phase boundaries.

B.6.84 In addition to the earthworks and construction works described, it is possible that piling will be required. At this time the type(s) of piling, which would be used at various locations across the site, is not known and it is likely that the contractor responsible for undertaking the works at the site would decide the method of piling.

B.6.85 BS5228-2 recognises that the most common form of vibration associated with piling is the intermittent type derived from conventional driven piling. The intensity of

vibration disturbance, which may be registered at a receptor, will be a function of many factors. These are set out in BS5228-2 and include:

- Energy per blow or cycle
- Distance between source and receptor
- Soil structure interaction i.e. nature of connection between soil and structure being monitored
- Construction of structure and location of measuring points e.g. soil surface, building foundation and internal structural element.

B.6.86 At this stage detailed information regarding the above is not known and the type of piling has not been confirmed. It is not therefore possible to assess the potential impacts of vibration generated by piling activities in accordance with the significance criteria set out in Table B6.4. To minimise the potential for vibration to be generated by piling it is recommended that careful consideration is given to the type of piling to be used. For example auger bored piles would be preferable to driven piles with regards to a reduced potential for noise and vibration to be generated. However, it is recognised that the piling process will need to be selected on the basis of the strata to be encountered, the loads to be supported and the economics of the system.

B.6.87 The receptors likely to be affected by piling will vary depending of the phase of the development under construction. Once the precise building locations, ground conditions for each location and type(s) of piling are confirmed, vibration levels could be estimated and recommendations for control made as appropriate.

Operational Phase Assessment

Road Traffic Noise and Sensitive Receptors

B.6.88 CRTN predictions have been carried out to assess any potential changes in road traffic noise at existing and proposed receptor locations due to the operation of the development.

B.6.89 The changes in noise levels at each of the receptors considered have been assessed by comparing the noise levels predicted for the “Without development” scenario with the “With Development” scenario in 2017 and 2022. The results are shown in Table B6.11. Graphical representation of the predicted noise propagation for each scenario can be found within Figures B6.4 – B6.7.

Table B6.11 - CRTN Predictions for the 2017 and 2022 "Without Development" and "With Development" Scenarios and Changes in Predicted Road Traffic Noise Levels

CRTN Receptor Number	Predicted $L_{10\ 18hour}$ dB(A) at the façade of the Receptor				Figures in dB(A)	
	2017 Without Development (Scenario 1) Figure B6.4	2017 With Development (Scenario 2) Figure B6.5	2022 Without Development (Scenario 3) Figure B6.6	2022 With Development (Scenario 4) Figure B6.7	Change in Predicted Road Traffic Noise Levels in 2017 Figure B6.8	Change in Predicted Road Traffic Noise Levels in 2022 Figure B6.9
CRTN1	70.6	64.6	70.6	64.6	-6.1	-6.0
CRTN2	69.2	69.8	69.2	69.8	+0.5	0.6
CRTN3	68.9	69.3	69.0	69.3	+0.3	0.3
CRTN4	68.1	69.0	68.1	69.1	+0.9	1.0

B.6.90 The changes in noise levels have been assessed against the significance criteria contained in Table B6.6. The results show that at each of the existing sensitive receptor locations, the noise impact due to changes in road traffic is Negligible. Therefore, noise from changes in road traffic levels need not be a consideration during the planning process. It should also be noted that there is a predicted drop in noise level due to the realignment of the A361 and the inclusion of the proposed junction. This would present a perceivable reduction in the acoustic climate at Crouch Cottages (CRTN1). Graphical representation of the predicted change in noise propagation for each of the predicted years can be found within Figures B6.8 – B6.9.

Proposed Sensitive Receptors and Noise

Road Traffic Noise at Proposed Residential Properties

B.6.91 Noise modelling has also been carried out to determine the future levels of road traffic noise at the residential areas of the proposed development, with the committed development traffic and the proposed development traffic in place. The results of the SoundPLAN daytime noise modelling for 2017 and 2022 (with the committed development and proposed development traffic in place, i.e. Scenarios 2 and 4) are shown on Figure B6.2 and Figure B6.3 respectively.

External Daytime Noise Levels

B.6.92 The Parameters Plan (reference JJG043/27/B) indicates that residential properties are proposed in the vicinity of the major road link adjacent to the proposed development i.e. the A361.

B.6.93 The results of the noise modelling for future years 2017 and 2022,with the development in place, indicates that the level of road traffic noise at the proposed residential areas, located nearest to, and with a direct line of sight of the A361, will range between 60dB $_{LAeq\ 16hour}$ and 70dB $_{LAeq\ 16hour}$.

B.6.94 Mitigation measures will therefore need to be incorporated into the design of the proposed development to ensure that the required external level of 55dB LAeq 16-hour is achieved in outdoor living areas, nearest to, and with a direct line of, sight of the A361 during the daytime.

B.6.95 Mitigation measures are discussed further in paragraphs Section B6.119 to B6.122.

Internal Daytime Noise Levels

B.6.96 In accordance with the requirements of the WHO 1999, the daytime noise levels, from external sources, in living rooms, should not exceed 35dB $L_{Aeq\ 16\ hour}$.

B.6.97 The noise modelling for future years 2017 and 2022, with the development in place, indicates that the level of road traffic noise at the proposed building facades of the residential areas, located nearest to, and with a direct line of sight of the A361, will range between 60dB LAeq 16hour and 70dB $L_{Aeq\ 16hour}$.

B.6.98 In turn, the level of noise attenuation that these facades, will need to provide to achieve the required internal noise level of 35dB $L_{Aeq\ 16\text{-}hour}$, during the daytime period (as required by WHO 1999) will be between 25dB(A) and 35dB(A).

B.6.99 Mitigation measures are discussed further in Section B6.123 to B6.130 of this chapter.

Internal Night-time Noise Levels

B.6.100 In accordance with the requirements of the WHO Guidelines, the night-time noise levels from external sources, in bedrooms, should not exceed 30dB $L_{Aeq\ 8\ hour}$ and 45dB L_{Amax}.

B.6.101 Daytime and night-time noise measurements were taken at monitoring locations within close vicinity of the proposed development. Road traffic was the dominant source of noise at these monitoring locations. The measurements indicate that the average night-time noise levels are between 14.9dB(A) and 7.4dB(A) lower than the daytime levels respectively. The modelled daytime noise levels have therefore been corrected by -7.4dB(A), to determine the night-time noise level at the facades of the proposed residential areas located nearest to, and with a direct line of sight of, major road links within and adjacent to the development. Scenarios for the 2017 and 2022 night-time noise contours are shown on Figure B6.10 and Figure B6.11 respectively.

B.6.102 Before internal noise levels can be calculated 2.5dB(A) must be added to the predicted noise levels to allow for the reflection of noise from the proposed housing facades when the buildings are in place.

B.6.103 The predicted night-time noise levels at the proposed facades of the residential areas, located nearest to and with a direct line of sight of the major road link adjacent to the development, will range between 50dB L_{Aeq} and 60dB L_{Aeq}. The maximum noise levels measured at ESR1, which presents a representative location for the facades of the proposed residential dwellings facing the A361, will be 68.8dB LAmax. In turn, the level of noise attenuation required at the façade, to achieve the required internal noise levels of 30dB LAeq 8-hour and 45dB LAmax, during the night-time period, will be between 30dB(A) and 23.8dB(A).

B.6.104 Mitigation measures are discussed further in sections B6.130 to B6.134 of this chapter.

Road Traffic Noise at the Proposed Primary School Sites

B.6.105 The Parameters Plan (reference JJG043/27/B) indicates that the development will include a school site, located in the southern, central part of the site.

B.6.106 In accordance with the requirements of BB93, the following daytime noise levels should be achieved:

- An upper limit of 60 dB $L_{Aeq\ (30\ minutes)}$ at the boundary of external premises used for teaching and recreation.
- 55 dB $L_{Aeq\ (30\ minutes)}$ in unoccupied playgrounds, playing fields and other outdoor areas.
- 50 dB $L_{Aeq\ (30\ minutes)}$ in at least one area of the unoccupied playgrounds, playing fields and other outdoor areas, to ensure suitable noise levels for outdoor teaching.
- Indoor ambient noise limits in schools of between 30 and 40 dB $L_{Aeq\ (30\ minutes)}$ depending on the use of the room.

B.6.107 The external daytime levels of road traffic noise at the proposed school site ranges between 50dB $L_{Aeq\ 16\text{-}hour}$ and 55dB $L_{Aeq\ 16\text{-}hour}$. The results of the noise modelling indicate that some mitigation measures may be required need to be incorporated into the design of the proposed school site. However, as the noise modelling has been undertaken without the inclusion of the proposed development, in practice this would provide additional screening from the local road networks and therefore further reduce the predicted noise levels at the proposed school.

Mitigation Measures

Construction Phase Assessment

Noise from Earthworks and Construction Phase Activities

B.6.108 To reduce the potential impact of noise levels generated by the construction phase of the development, at existing receptor locations in the immediate vicinity of the site, mitigation measures will be put in place.

B.6.109 In addition, best working practice will be implemented during each phase of the earthworks and construction works at the site. The construction works will follow the guidelines in BS5228-1 and the guidance in BRE Controlling particles, vapour and noise pollution from construction sites, Parts 1 to 5, 2003.

B.6.110 The following measures will be put in place to minimise noise emissions:

- When works are taking place within close proximity to those sensitive receptors identified, screening of noise sources by temporary screen may be employed.
- All plant and machinery should be regularly maintained to control noise emissions, with particular emphasis on lubrication of bearings and the integrity of silencers.
- Site staff should be aware that they are working adjacent to a residential area and avoid all unnecessary noise due to misuse of tools and equipment, unnecessary shouting and radios.
- A further measure to reduce noise levels at the sensitive receptors would include, as far as possible, the avoidance of two noisy operations occurring simultaneously in close proximity to the same sensitive receptor.
- Adherence to any time limits imposed on noisy works by the Local Authority.
- Implement set working hours during the week and at weekends.
- Ensure engines are turned off when possible.
- Should earthworks/earthworks and construction activities need to be carried out during night-time hours, the local authority could include a planning condition which requests advance notice and details of any night working to provided.

B.6.111 The noise impacts of earthworks and construction phases, with the implementation of best working practice and restriction on working hours, are considered to be generally negligible, with only brief periods of minor adverse impacts.

Vibration from Earthworks and Construction

B.6.112 At this stage it is not proposed to introduce any specific vibration mitigation measures to any receptors. However, as with noise from earthworks and construction works, working practices should be implemented to prevent unnecessary vibration at all receptors as much as possible.

B.6.113 To keep groundborne vibration to a minimum the following measures, as referred to in BS5228-2, should be put in place:

- Substitution: Where reasonably practicable plant and or methods of work likely to cause significant levels of vibration at the receptors identified, should be replaced by less intrusive plant/methods of working.

- Vibration Isolation of plant at source: This may prove a viable option where the plant is stationary (e.g. a compressor, generator) and located close to a receptor.

B.6.114 In relation to piling, should it be required, there are a number of measures which can be implemented, depending upon the type of piling chosen. BS5228-2 indicates that mitigation might include: use of alternative methods, removal of obstructions, provision of cut-off trenches, reduction of energy input per blow, reduction of resistance to penetration. Continuous flight augering would cause minimal vibration even very close to the piling operation.

B.6.115 As the construction programme and methodologies become more defined it is suggested that earthworks and construction vibration be reconsidered and that a detailed strategy for control be implemented.

B.6.116 The vibration impacts of earthworks and construction phases, with the implementation of best working practice, are considered to be generally negligible, with only brief periods of minor adverse impacts.

Operational Phase Assessment

Road Traffic Noise and Existing Sensitive Receptors

B.6.117 The noise levels predicted at the existing receptors locations, for the "Without Development" and "With Development" scenarios, in both 2017 and 2022, have been compared.

B.6.118 The results indicate that any change in road traffic noise at receptors CRTN2 to CRTN4 will be below the threshold of perception and will not be significant. Results at receptor CRTN1 indicate that there is a perceivable drop in noise level due to the realignment of the A361 and the inclusion of the proposed junction. Mitigation measures are therefore not necessary for these receptor locations.

Proposed Sensitive Receptors and Noise

Road Traffic Noise at Proposed Residential Areas

External Daytime Noise Levels

B.6.119 To meet the outdoor requirements of WHO 1999 during the daytime, i.e. 55dB LAeq 16hour, mitigation measures will need to be incorporated along the boundaries of the residential areas located immediately adjacent to the A361.

B.6.120 The Parameters Plan (drawing number JJG043/27/B) indicates that the proposed residential areas will be approximately 20m from the carriageway of A361.

B.6.121 At this stage a detailed layout showing the individual plots is not available. To reduce the level of road noise in the proposed outdoor living areas of the development, it is recommended that the following mitigation measures are considered for inclusion in the detailed site design:

- The residential buildings proposed on the site, adjacent to the A361, could be constructed to act as a barrier themselves. For example a row of semi-detached properties at the boundary of the residential areas, located nearest to the A361 would protect properties further into the site.
- Positioning of garden areas on the shielded side of buildings away from the A361.
- Local mitigation measures, i.e. 1.8m to 2.0m high wall or close boarded fence, could be constructed at garden areas with a line of sight of the A361 and employment and local centre areas.

B.6.122 Figure B6.3 shows a SoundPLAN model output for the daytime period of 2022 "With Development". The drawing indicates that the noise levels in proposed garden areas reduces when moving into the site. As these dwellings will also be immediately behind the proposed residential properties located nearest to, and with a direct line of sight of, the A361, they are likely to achieve the required noise limit of 55dB $L_{Aeq\ 16hour}$ with the additional distance attenuation and screening.

Internal Daytime Noise Levels

B.6.123 In accordance with the requirements of WHO 1999, the daytime noise levels, from external sources, in living rooms should not exceed 35dB $L_{Aeq\ 16\ hour}$.

B.6.124 The noise attenuation provided by the overall building façade, for each property, has been considered to determine likely internal daytime noise levels. Subject to the provision of detailed building and design information it would be reasonable to assume that the proposed development design includes glazing to living room areas comprising about 25% of the façade area. To calculate the overall attenuation provided by this percentage of glazing in a brick or block façade, a non- uniform partition calculation can be used.

B.6.125 The calculation combines the different degrees of attenuation of the wall element and the window element. A façade comprising solid brick or blockwork, will attenuate by between 45-50 dB (BRE Digest 338 "Insulation against external noise") whereas standard thermal glazing will attenuate traffic noise by 26-29dB(A) (BRE Digest 379 "Double glazing for heat and sound insulation"). The overall noise attenuation provided by the above combination is between 31.9dB(A) and 34.9dB(A).

B.6.126 Some of the building facades of living rooms, located nearest to and with a direct line of sight of the A361 will require higher specification glazing in order to achieve the internal noise limit of 35dB $L_{Aeq\ 16\ hour}$. The glazing unit will need to attenuate traffic noise by up to 30dB(A) to ensure that the overall noise attenuation provided by the façade (i.e. the combined wall and window) would be 36.0dB(A) with windows closed.

B.6.127 For the majority of building facades located further into the site, standard double glazing in a solid brick or blockwork façade (as detailed in paragraph B6.125) would be sufficient to achieve the internal daytime noise levels, with windows closed.

B.6.128 However, with windows open the attenuation provided by the façade will be approximately 15dB(A). This would allow the recommended internal noise limits to be exceeded in some living room areas, located nearest to and with a direct line of sight of the A361. To remove the need to open a window, and hence maintain the attenuation provided by the double glazing, acoustic ventilation will need to be installed. The acoustic ventilation proposed at the site will, as a minimum, comply with Building Regulations 2000 Approved Document F1 Means of Ventilation and

British Standard BS5925 1991: "Code of Practice for Ventilation Principles and Designing for Natural Ventilation".

B.6.129 The implementation of the recommended glazing together with acoustic ventilation should ensure that the required internal daytime noise limits are met in those areas of the site where the external noise levels are greater than 55dB $L_{Aeq\ 16\text{-}hour}$. Alternatively, noise sensitive living areas could be positioned away from the A361 on the screened sides of buildings.

B.6.130 Noise attenuation schemes detailing the proposed glazing and ventilation requirements for residential dwellings in each area of the proposed development, on a plot by plot basis, can be submitted to CDC for review and approval at a reserved matters stage.

Internal Night-time Noise Levels

B.6.131 In accordance with the requirements of WHO 1999, the night-time noise levels, from external sources, in bedrooms should not exceed 30dB $L_{Aeq\ 8\ hour}$ and 45dB L_{Amax}.

B.6.132 The results of the noise modelling indicates that standard thermal glazing in a solid brick or blockwork facade (as detailed in paragraph B6.125) would be sufficient to achieve the internal night-time noise levels, with windows closed.

B.6.133 However, with windows open the attenuation provided by the façade will be approximately 15dB(A). This would allow the recommended internal noise limits to be exceeded in some bedrooms, located nearest to and with a direct line of sight of the A361. To remove the need to open a window and hence maintain the attenuation provided by the double glazing, acoustic ventilation will need to be installed.

B.6.134 The implementation of glazing together with acoustic ventilation should ensure that the required internal night-time noise limits are met in those areas of the site where the external noise levels are greater than 45dB $L_{Aeq\ 8\ Hour}$ and 60dB $L_{Amax.}$ Alternatively, bedrooms could be positioned away from the A361 on the screened sides of buildings.

B.6.135 Noise attenuation schemes detailing the proposed glazing and ventilation requirements for residential dwellings in each area of the proposed development, on a plot by plot basis, can be submitted to CDC for review and approval at a reserved matters stage.

Road Traffic Noise at the Proposed School Sites

External Daytime Noise Levels

B.6.136 At this stage a detailed layout showing the design of the proposed school site is not available. To reduce the level of road traffic noise at the proposed school site, mitigation measures will need to be incorporated to ensure the outdoor requirements of BB93 during the daytime, i.e. 55dB LAeq 30 minutes, are achieved.

B.6.137 The mitigation measures required will depend on the location and the orientation of the proposed school buildings. For the purpose of this assessment, it is assumed that the proposed school building will be located in the southern, central part of the school site. To further reduce the levels of road traffic noise, it is recommended that a 2m high barrier be constructed along the northern boundary of the school site.

B.6.138 Figure B6.3 demonstrates the level of noise likely to be achieved in playing areas in the southern part of the school site, without indicative school buildings and the proposed mitigation measures in place. The noise levels will achieve the required noise limit of 60dB $L_{Aeq\ 30\ minutes}$ at the school site boundary, together with the limit of 55dB $L_{Aeq\ 30\ minutes}$ across the majority of the playing fields.

B.6.139 The location, shape and orientation of the school building(s) of the school site, could be designed to specifically reduce road traffic noise, and to ensure that an outdoor area suitable for teaching is created within the school site.

B.6.140 Noise attenuation schemes detailing the proposed mitigation measures to be implemented, to ensure the external noise limits are achieved at the school development sites, can be submitted to CDC for review and approval at a reserved matters stage.

Internal Daytime Noise Levels

B.6.141 The level of noise attenuation that the facades of the school will need to provide, to achieve the more stringent internal noise level of 30dB $L_{Aeq\ 30\ minutes}$, during the daytime period (as required by BB93), will be between 20dB(A) and 25dB(A).

B.6.142 At this stage a detailed layout showing the design of the proposed school sites is not available. The level of attenuation the building facades will need to attenuate will therefore be dependent on the proposed use of the classroom.

B.6.143 Some of the building facades of proposed schools, located nearest to and with a direct line of sight of local roads, will require higher specification glazing should the more stringent internal noise limit of 30dB $L_{Aeq\ 30\text{-}minutes}$ need to be achieved. The glazing unit will need to attenuate traffic noise by up to 30dB(A) to ensure that the overall noise attenuation provided by the façade (i.e. the combined wall and window) is be 36dB(A) with windows closed.

B.6.144 Standard double glazing will be sufficient to achieve the internal daytime noise levels of 40dB LAeq 30 minutes, with windows closed.

B.6.145 In those areas of the site where noise levels at the school building facades exceed 45dB $L_{Aeq\ 30\ minutes}$, noise will only be attenuated adequately provided the windows remain closed. To remove the need to open a window and hence maintain the attenuation provided by the double glazing, acoustic ventilation will need to be installed in the building facades.

B.6.146 The implementation of glazing together with acoustic ventilation should ensure that the required internal noise limits are met in proposed school buildings.

B.6.147 Noise attenuation schemes detailing the proposed glazing and ventilation requirements for proposed school sites of the proposed development can be submitted to CDC for review and approval at a reserved matters stage.

Operational Noise and Sensitive Receptors

B.6.148 A detailed noise assessment will be required for each employment unit once the proposed activities are known. This will take into account actual levels of activity and plant and recommendations will be made for mitigation as appropriate.

Residual Impacts

Construction Phase Assessment

Noise from Enabling Works and Construction

B.6.149 Once the best working practices detailed in the mitigation section of this chapter are implemented the residual noise impacts associated with the earthworks and construction phase will be negligible, with only brief periods of minor adverse impacts likely.

Vibration from Enabling Works and Construction

B.6.150 Once the best working practices detailed in the mitigation section of this chapter are implemented the residual vibration impacts associated with the earthworks and construction phase will be negligible, with only brief periods of minor adverse impacts likely.

Operational Phase Assessment

Road Traffic Noise and Sensitive Receptors

B.6.151 The increase in road traffic noise in 2017 and 2022, at the existing sensitive receptors adjacent the local road network in the immediate vicinity of the site, will not be perceptible and the impact will be negligible. Results at receptor CRTN1 indicate that there is a perceivable drop in noise level due to the realignment of the A361 and the inclusion of the proposed junction. Mitigation measures are therefore not considered necessary.

Proposed Sensitive Receptors and Noise

B.6.152 Once the mitigation measures detailed in the mitigation section of this chapter have been implemented the residual impact of road traffic noise from vehicles travelling along the A361, on the proposed residential areas and school site of the development, will be negligible.

Operational Noise and Sensitive Receptors

B.6.153 At this stage it is not considered necessary to recommend specific mitigation measures to control noise from the Wykham Park Farm development.

B.6.154 It is however recognised that a detailed noise assessment will be required for each unit once the proposed activities are known. This will take into account actual levels of activity and plant and recommendations will be made for mitigation as appropriate. The mitigation will ensure that any residual impacts are not significant.

Cumulative Impacts

B.6.155 The noise assessment also considers the cumulative impacts associated with the proposed development; consented; committed; and known development sites in the area of the site.

B.6.156 Traffic data for consented, committed and known development sites in the area of the site, together with all phases of the proposed development, has been obtained from SBA, the transport consultants for the project and incorporated into the information used as a basis for the assessment of road traffic noise.

B.6.157 The changes in road traffic noise due to the development generated traffic have been assessed at a number of existing and proposed sensitive receptors. The assessment confirms that in accordance with the significance criteria included in this chapter, the increase in road traffic noise in 2017 and 2022, at the existing sensitive receptors CRTN2 to CRTN4, will be imperceptible and the impact will be negligible. Furthermore, results at receptor CRTN1 indicate that there is a perceivable drop in noise level due to the realignment of the A361 and the inclusion of the proposed junction. Mitigation measures are not therefore considered necessary.

Summary

B.6.158 This chapter assesses the noise and vibration impacts of the proposed Wykham Park Farm development. It considers the potential impacts generated by the earthworks, construction phase and operational phases of the proposed development.

B.6.159 To establish baseline noise levels, at a number of sensitive receptors and across the proposed development, attended noise surveys have been carried out. In addition,

the future traffic noise levels at a number of sensitive receptor locations have been predicted using the computer modelling software SoundPLAN Version 7.1.

Construction Phase Assessment

B.6.160 The activities carried out during the earthworks and construction phase of the development may have the potential to generate short term increases in noise levels above the recommended noise limits, set in accordance with current guidance, at existing sensitive receptors surrounding the site. The use of heavy plant associated with the earthworks and construction works also has the potential to give rise to groundborne vibration.

B.6.161 Given the small distances between the construction activities and the nearest sensitive receptors, some sensitive receptors may experience minor adverse noise and vibration impacts. However this would occur temporarily and only for short periods.

B.6.162 To minimise the potential impact of construction works mitigation measures would be put in place. These will include the restrictions on working hours, the implementation of temporary screening and best working practice where possible.

B.6.163 In addition to earthworks it is possible that piling will be required. At this stage detailed information regarding the type of piling has not been confirmed. To minimise the potential for vibration to be generated by piling it is recommended that careful consideration be given to the type of piling used.

B.6.164 With the implementation of best working practice and restriction on working hours, the noise and vibration impacts of earthworks and construction phases, will be generally be negligible, with only brief periods of minor adverse impacts likely.

Operational Phase Assessment

Road Traffic Noise and Sensitive Receptors

B.6.165 The changes in road traffic noise due to the development generated traffic have been assessed at a number of both existing and proposed sensitive receptors. The assessment confirms that in accordance with the significance criteria included in this chapter, the increase in road traffic noise in 2017 and 2022 at the existing sensitive

receptors CRTN2 to CRTN4 will be below the threshold of perception and is therefore considered to be negligible. Furthermore, results at receptor CRTN1 indicate that there is a perceivable drop in noise level due to the realignment of the A361 and the inclusion of the proposed junction. Mitigation measures are not therefore required.

Proposed Sensitive Receptors and Noise

B.6.166 The proposed noise sensitive areas of the development, i.e. the residential areas and primary school sites, will be subjected to noise from existing and proposed sources. The dominant source of existing noise at the sensitive areas of the proposed development is road traffic on the A361. In addition to the existing sources of noise, development generated vehicle movements on the local road network have the potential to increase noise levels across the proposed development.

B.6.167 A noise survey and noise modelling has been carried out to determine the noise levels, at the noise sensitive areas of the development, once operational. The results of the baseline noise survey and noise modelling indicate that the noise levels at the proposed development should not be a determining factor in granting planning permission in accordance with current guidance. However, mitigation measures will need to be incorporated into the site design to ensure that the required external daytime, and internal daytime and night-time noise levels, are achieved at residential areas and the proposed school sites.

B.6.168 To meet the external daytime, and internal daytime and night-time noise limits, mitigation measures will need to be incorporated as follows:

- The incorporation of a stand-off between the edge of the proposed residential areas of the development and the major road links adjacent to the proposed development where possible;
- The orientation of outdoor living areas to the rear of the proposed residential properties nearest to and with a direct line of sight of the A361; and
- Glazing and ventilation in building facades of noise sensitive rooms located nearest to and with a direct line of sight of the A361.

Operational Noise and Sensitive Receptors

B.6.169 A detailed noise assessment will be required for each unit once the proposed activities are known. This will take into account actual levels of activity and plant and recommendations will be made for mitigation as appropriate.

B.7 ECOLOGY AND WILDLIFE

Introduction

General Description of the Site Area

B.7.1 The site comprises arable fields, species rich hedgerows, mature trees, semi-natural broad-leaved woodland and mixed plantation.

Scope of Section

B.7.2 This section, prepared by Wardell Armstrong LLP, comprises an ecological impact assessment of the proposed development at Wykham Park Farm and includes:

- Data-gathering of existing information on the proposed site and its surroundings from various sources;
- An initial survey of the proposed site, combined with an assessment of the potential for protected species (such as badger, bats, dormice, great crested newt, otter, water vole and breeding birds) undertaken by Halcrow Group Ltd (here after referred to as Halcrow);
- An Extended Phase 1 Habitat Survey and protected species surveys for badgers and bats undertaken by Wardell Armstrong LLP;
- An evaluation of the site in terms of its nature conservation value;
- An assessment of the potential ecological impacts of the proposed development including habitat loss and fragmentation, disturbance and potential off-site impacts;
- An assessment of the potential cumulative ecological impacts of the development and land use proposals for parcels of land adjacent to the application area, namely the Land South of the Salt Way at Crouch Farm, Bloxham Road (the Horgan Land) and Longford Park;
- Proposed mitigation measures in respect of adverse impacts; and
- Identification of residual impacts, taking into account proposed mitigation measures.

Methodology

Enquiries

B.7.3 Background information on relevant wildlife designations and records of species that are scheduled, rare (at national or local level) or nationally scarce, within 2km of the site was requested from the Thames Valley Environmental Records Centre by Halcrow in 2012.

B.7.4 The Multi-Agency Geographic Information for the Countryside (MAGIC)[12] and Natural England's 'Nature on the Map'[13] websites were utilised to gather data.

B.7.5 Additionally, the UK and Oxfordshire Biodiversity Action Plans (BAP) were also reviewed. BAPs are the delivery mechanism for the conservation of species listed on Section 41 (England) of the Natural Environment and Rural Communities Act (NERC) Act 2006.

Survey Methodologies

Extended Phase 1 Habitat Survey

B.7.6 An initial survey of the proposed development was undertaken by Halcrow in 2012. During the subsequent surveys undertaken by Wardell Armstrong LLP in August 2012, an Extended Phase 1 Habitat Survey was also undertaken during which the habitats were checked broadly following the techniques outlined in the '*Handbook for Phase 1 Habitat Survey*' (Joint Nature Conservation Committee, 2010)[14] and the '*Guidelines for Baseline Ecological Assessment*' (Institute of Environmental Assessment, 1995)[15.] The purpose of this survey was to map the habitats present within the development area and to make an assessment of the potential for protected species to be present.

B.7.7 Target notes were used to describe habitat and species composition and highlight features of ecological interest and are attached as Appendix B7.1. Drawing WM10671-B7.1 shows the location of ecological features and target notes. Plant names follow *'New Flora of the British Isles'* [Stace, 1997 (2nd edition)][16]. The common and scientific name of each of the botanical species is provided when first mentioned in the text, but only the common name is stated thereafter.

B.7.8 The presence of a legally protected species is a material consideration for a local authority dealing with planning applications for any development that would be

[12] www.magic.gov.uk

[13] www.natureonthemap.org.uk

[14] Joint Nature Conservation Committee (2010). *Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit*. JNCC.

[15] Institute of Environmental Assessment (1995). *Guidelines for Ecological Assessment.* E & F Spon, London

likely to result in harm to the species or its habitat (National Planning Policy Framework, 2012). Therefore, preliminary investigations were undertaken during the Extended Phase 1 Habitat Survey in respect of the potential presence of legally protected species and BAP species. An overview of species protection is provided in Appendix B7.2.

B.7.9 Following the initial survey, Halcrow recommended that further detailed surveys for badger, bats and hedgerows should be undertaken. These additional surveys were undertaken by Wardell Armstrong LLP in August and September 2012.

Hedgerow Assessment

B.7.10 A hedgerow assessment was undertaken in August 2012. A description of each hedgerow is found in the target notes attached as Appendix B7.1. Hedgerows were assessed broadly following the criteria for 'important' hedgerows under the Hedgerow Regulations 1997 (wildlife and landscape). The criteria are complex, and include hedgerows which have 7 woody species; hedgerows with 6 woody species plus at least 3 of the features identified in sub-paragraph 4 of the criteria (e.g. one standard tree for every 50m hedgerow length); or at least 5 woody species at least 4 of the features specified in sub-paragraph 4. The application of the criteria to the hedgerows relates mainly to the flora species present and is not an exhaustive assessment. The hedgerow assessment is provided in Appendix B7.3.

Fauna Surveys

Amphibians

B.7.11 Amphibians rely on waterbodies (typically ponds, but also slow moving small water courses) for breeding but otherwise they spend much of their time on dry land. They may enter a period of low activity as temperatures fall below 5˚C. This generally begins in late September and by the end of November most amphibians are dormant for much of the time. Amphibians seek refuge over winter in sites similar to those sought during the day such as an underground crevice or crack, a void in a tree stump or bank or under refugia such as piles of rock or dead wood. Adult amphibians migrate to breeding ponds in spring, and sometimes as early as the first frost free days, at the end of January.

[16] Stace, C. (1997) *New Flora of the British Isles 2nd edition.* The Bath Press, Bath.

B.7.12 On land amphibians engage in foraging, dispersing and resting. Foraging takes place mostly during hours of darkness over a range of habitats that support invertebrate species. Movement at night may reduce the risk of predation and desiccation.

B.7.13 Whilst on land, outside the over-wintering period, amphibians may require refuges from extremes of weather (i.e. high temperatures and dry periods) and may rest in areas of dense vegetation, under refuges or underground.

B.7.14 The habitats on site were assessed for their potential to provide breeding and foraging habitat and shelter for great crested newts and other amphibians.

B.7.15 Ordnance Survey maps and aerial photographs were also reviewed to identify if any waterbodies were present within 500m of the proposed site. No GCN surveys were undertaken as the Extended Phase 1 Habitat Survey Wardell Armstrong LLP was carried out after the 2012 GCN survey season.

Badgers

B.7.16 All information relating to badgers (*Meles meles*) has been provided within the confidential Appendix B7.4 and is not for general public release.

Bats

B.7.17 Bats roost in a variety of places. Roosting habitat includes buildings and structures, caves and trees and refers to any structure or place that is used for shelter or protection whether or not bats are present at the time.

B.7.18 Bats also use a variety of habitats for foraging with broad-leaved woodland and water habitats being the most favourable. Arable, improved grassland and moor land are less favoured. Within these less favoured landscapes, linear features such as hedgerows, lines of trees and riparian strips are often used by bats as they provide rich food sources, shelter and commuter corridors.

B.7.19 During the initial survey, Halcrow assessed the habitats for their potential to provide food sources and navigation routes for bats. Additionally, the trees on site were assessed for their potential to support roosting bats.

B.7.20 Potential impacts on bats from the proposed development were considered at an early stage to inform the design of the emergence/re-entry and activity surveys. The hedgerows and trees with bat roost potential were considered to be the most important habitats for bats within the site. The arable fields were considered to be of negligible value to bats. Some hedgerow loss was anticipated as part of the development, however the importance of the hedgerows as foraging and flight-lines for bats and the location of the trees with bat roost potential were taken into consideration as part of the master-planning for the site and opportunities to plant new hedgerows, enhance existing hedgerows and create habitats within new areas of public open space for bats were identified.

B.7.21 It was therefore considered that potential residual impacts on bats from the development would likely be low and that dusk and dawn survey visits in August and September would be sufficient to determine which habitats were being used by bats within the site, to identify the majority of bat species using the site, and to ascertain if any of the trees were being used as bat roosts. This survey effort was considered appropriate to provide enough information to enable an impact assessment on bats to be carried out. August is a particularly productive time to undertake dawn re-entry surveys as inexperienced young bats are more likely to be detected as they try to re-enter roosts.

B.7.22 Dusk/dawn bat activity surveys were undertaken between 14th and 17th August as well as between 11th and 14th September 2012. At the beginning of each dusk survey an emergence survey was undertaken and at the end of each dawn survey a dawn re-entry survey was undertaken at mature trees with the potential for bat roosts. The bat activity surveys were undertaken to establish the bat foraging and commuting activity on site.

B.7.23 The survey broadly followed the guidance provided in '*Bat Surveys – Good Practice Guidelines*'[17]. Transects were walked to allow complete coverage of the site by two surveyors. The starting point for the transects and the directions they were walked

[17] The Bat Conservation Trust (2012) Bat Surveys – Good Practice Guidelines, 2nd edition. Bat Conservation Trust, London

were altered between each survey. The transects walked and the mature trees observed during the August surveys are shown on Drawing WM10671-B7.2 and the September survey are shown on Drawing WM10671-B7.3. A Bat Box II bat detector was used to detect foraging or commuting bats and digital recordings were made from the bat detector and analysed later using BatSound analysis programme version 3.31. Observations of bat behaviour, size and the direction of the flight path were also noted where possible.

Birds

B.7.24 During the initial survey and Extended Phase 1 Habitat Survey, an assessment was made of the habitats on site for their suitability to support breeding birds.

Dormouse

B.7.25 Dormice (*Muscardinus avellanarius*) are known not to travel far from their nests and are highly arboreal and therefore require woodland or hedgerow habitat with an adequate food supply (i.e. species-rich hedgerows) with good structure, and which are suitably managed. The decline of dormouse is likely to be linked to the decrease of species rich hedgerows, as a result of management practices and as a result of fragmentation of woodland.

B.7.26 Dormice have a varied diet but nuts including hazel, beech and chestnuts are a particularly important food source before hibernation.

B.7.27 During the initial survey and the Extended Phase 1 Habitat Survey, an assessment was made of the habitats on site for their suitability to support dormouse.

Reptiles

B.7.28 Grass snakes (*Natrix natrix*) are most commonly associated with wet habitats such as ponds, lakes, marshes, streams, ditches and rivers and have a diet consisting almost entirely of amphibians. The adder (*Vipera berus*) and slow worm (*Anguis fragilis*) are typically associated with drier, heathland habitat and the common lizard (*Zootoca vivipara*) is found in a wide range of habitats. The smooth snake (*Coronella austriaca*) and sand lizard (*Lacerta agilis*) are found in similar habitats, typically mature heathland. All these species are “cold blooded”, and need to bask in sunlight; such basking opportunities are readily found on south-facing slopes.

B.7.29 Smooth snake populations in the UK are limited to lowland heath in Hampshire, Devon, Dorset and Surrey. A large proportion of the sand lizard population can also be found in these areas but there are also some smaller populations in the Weald and Thames Basin heath lands and they can be found on sand dunes in Merseyside, Wales and south-east England. During the initial survey and the Extended Phase 1 Habitat Survey, an assessment was made of the habitats on site for their suitability to support the more common reptile species.

Survey Limitations

B.7.30 The ecological surveys were not intended to produce a comprehensive list of plants or animals for the habitats as any ecological survey is limited by factors which affect the presence of plants and animals such as time of year, migration patterns and behaviour.

B.7.31 However, the results of the surveys allow an assessment of significance of the potential impacts from the proposed development and consideration of appropriate mitigation measures.

B.7.32 Dense vegetation may have obscured badger signs, in particular in the hedgerow along the eastern boundary of the site.

Baseline Conditions

Information received from enquiries

B.7.33 Information was received from Thames Valley Environmental Records Centre (TVERC). The Multi-Agency Geographic Information for the Countryside (MAGIC) and Natural England's 'Nature on the Map' websites were utilised to gather data.

B.7.34 The location of all statutory and non-statutory nature conservation designations are shown on the plan provided by TVERC (Appendix B7.5).

Statutory Nature Conservation Designations

B.7.35 Information received from MAGIC and TVERC has revealed that there are no statutory designations within 2km of the site.

Non-Statutory Nature Conservation Designations

Local Wildlife Sites (LWS)

B.7.36 Information received from TVERC has revealed the presence of one Local Wildlife Site within 2km of the development site. The Bretch LWS is situated approximately 1.2km to the north-west of the site. It covers an area of 2.3ha and comprises an abandoned ironstone working, which is now used as a picnic area. Steep spoil heaps support a varied grassland flora with pockets of richer neutral and calcareous grassland amongst rough neutral grassland. The site supports a range of butterflies including ringlet and marbled white.

UKBAP Habitats

B.7.37 Information received from Natural England's 'Nature on the Map' has shown there are a number of areas of two types of UKBAP habitats within 2km of the site. There are seven areas located within 2km of the site that are listed on the traditional orchard inventory for England. The closest area is located approximately 0.4km to the east of the site.

B.7.38 Additionally, there are two areas of floodplain grazing marsh within 2km. The closest is located approximately 0.8km to the south of the site whereas the second is situated approximately 1.7km to the east of the site.

Local BAP Habitats and Species

B.7.39 A review of the Oxfordshire Local Biodiversity Action Plan (LBAP) highlights the habitats that are potentially relevant to the proposed development site as shown in Table 1. The Oxfordshire LBAP also lists a number of priority species. The priority species potentially relevant to this site have also been identified in Table B7.1.

Table B7.1 – Oxfordshire Local Biodiversity Action Plan Potentially Relevant Habitats and Species

Habitats	
Arable and Horticulture	
Arable Field Margins	
Hedgerows	
Species	
Common Name	***Scientific Name***
Common swift	*Apus apus*
Swallow	*Hirundo rustica*
Dormouse	*Muscardinus avellanarius*

Barn Owl	*Tyto alba*
Lapwing	*Vanellus vanellus*

Protected Species

Flora

Protected / Notable Species

B.7.40 TVERC holds a record for bluebell (*Hyacinthoides non-scripta*), which is listed on Schedule 8 of the Wildlife and Countryside Act 1981, within 2km of the site. Additionally, TVERC holds a record for corn buttercup (*Ranunculus arvensis*), a UKBAP species, within 2km of the site. Neither of these records is located on site.

Invasive Species

B.7.41 TVERC holds no records for invasive species within 2km of the site.

Fauna

Amphibians

B.7.42 TVERC holds a number of records of smooth newt (*Lissotriton vulgaris*) within 2km of the site. The closest records are located approximately 1.0km to the south-east of the site. TVERC holds two records for common toad (*Bufo bufo*) of which the closest record (a historic record from 1988) is located approximately 0.7km to the south of the site. Additionally, TVERC holds a number of records for common frog (*Rana temporaria*) of which the closest is situated approximately 0.8km to the south-east of the site. TVERC holds no records for great crested newts (*Triturus cristatus*) within 2km of the site.

Badgers

B.7.43 All information relating to badgers has been provided within the ***confidential*** Appendix B7.4 and is not for general public release.

Bats

B.7.44 TVERC holds three records for common pipistrelle (*Pipistrellus pipistrellus*) and two records for unidentified pipistrelle bat (*Pipistrellus sp.*) within 2km of the site. The closest record is situated approximately 0.3km to the north of the site.

Birds

B.7.45 TVERC holds records of numerous bird species which occur within 2km of the site. However, TVERC holds no records of species listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) (W&C 1981) within 2km of the site.

B.7.46 Bird species which are protected, listed as UKBAP priority species and/or priority species in England (under the NERC Act Section 41) and / or listed on the RSPB's red or amber list of species of conservation concern which TVERC had records for within 2km of the site are summarised in Table B7.2.

Table B7.2 – Birds species records* within 2km of site

Bird Species	Protection	UKBAP priority species/Priority Species in England	Red / Amber list of birds of high / medium conservation concern
Swift (*Apus apus*)			Amber
House sparrow *(Passer domesticus)*		UKBAP	Red
Tree sparrow (*Passer montanus)*		UKBAP	Red
European golden plover *(Pluvialis apricaria)*			Amber
Bullfinch *(Pyrrhula pyrrhula)*		UKBAP	Amber
Starling *(Strunus vulgaris)*		UKBAP	Red
Song thrush *(Turdus philomelos)*		UKBAP	Red

**records sourced from TVERC records*

Brown Hare (Lepus europaeus)

B.7.47 TVERC holds one record of brown hare situated approximately 1.2km to the west of the site.

Dormouse

B.7.48 TVERC holds no records for dormice within 2km of the site.

Hedgehog (Erinaceus europaeus)

B.7.49 TVERC holds a record of hedgehog located approximately 1.0km to the south-east of the site.

Invertebrates

B.7.50 Information received from TVERC has revealed historic records (pre-1995) of four UKBAP invertebrate species within 2km of the site. These include records of white-letter hairstreak (*Satyrium w-album*) which are located along the Salt Way along the northern boundary of the site. Additionally, TVERC holds records for wall (*Lasiommata megera*), small heath butterfly (*Coenonympha pamphilus*) and shaded broad-bar (*Scotopteryx chenopodiata*) all of which are not located on or directly adjacent to the site.

Otter (Lutra lutra)

B.7.51 TVERC holds no records for otter within 2km of the site.

Reptiles

B.7.52 TVERC holds six records for grass snake (*Natrix natrix*) located within 2km of the site. The closest record is situated approximately 0.8km to the south-east of the site.

Water vole (Arvicola amphibious)

B.7.53 TVERC holds two historic records (from 1988) of water vole within 2km of the site. The closest of which is located approximately 1.1km to the south of the site.

White-clawed crayfish (Austropotamobius pallipes)

B.7.54 TVERC holds one historic record (from 1979) for white-clawed crayfish within 2km of the site. The record is located approximately 1.2km to the south of the site.

Other Species

B.7.55 TVERC holds two records for polecat (*Mustela putorius*), a UKBAP species, within 2km of the site. The closest record is situated approximately 0.9km to the south-west of the site.

Results of Extended Phase 1 Habitat Survey

Description of Habitats

Arable fields

B.7.56 The site mainly comprises arable fields which at the time of survey were under arable crop. The field margins vary from virtually nonexistent to narrow (around 0.25m to around 1.5m wide). The majority of the margins are dominated by common nettle (*Urtica dioica*) with hedge bindweed (*Catystegia sepium*) and yellow oat grass (*Trisetum flavescens*).

Hedgerows

B.7.57 The site contains eleven hedgerows ranging from defunct species poor hedgerows to intact species rich hedgerows. The species composition of each hedgerow varies and a description of each hedgerow is provided in the target notes attached in Appendix B7.1. Species generally present in most hedgerows within the site include hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) and elder (*Sambucus nigra*). Half of the hedgerows contained five or more woody species along their length.

B.7.58 Bramble (*Rubus fructicosus* agg.) and dog-rose (*Rosa canina*) are frequently found within the hedgerows and common nettle and ground ivy (*Glechoma hederacea*) are frequently found within the ground flora. Other species commonly noted in the ground flora were hogweed (*Heracleum sphondylium*), ivy (*Hedera helix*), cleavers (*Galium aparine*) and lords and ladies (*Arum maculatum*).

B.7.59 Six hedgerows are considered to have the potential to be deemed 'important' under wildlife and landscape criteria of the Hedgerow Regulations 1997. Appendix B7.3 details the results of the application of the criteria to determine the potential for 'important' hedgerows. The six hedgerows are target noted as H1, H2, H4, H12, H15 and H16 on the habitat plan (Drawing WM10671-B7.1).

Mature/Semi mature trees

B.7.60 Numerous hedgerows have semi-mature or mature trees associated with them, which have been described in the target notes (Appendix B7.1). Hedgerow 1 along the northern boundary includes a number of mature trees as does Hedgerow 12 along the western boundary of the site. Species include ash (*Fraxinus excelsior*), pedunculate oak (*Quercus robur*), sycamore (*Acer psuedoplatanus*) and lime (*Tilia x*

europea). Due to the number of mature trees they have not been mapped on the habitat plan.

Broad-leaved Woodland / Mixed Plantation

B.7.61 A small area of semi-natural mixed woodland is located in the north-western corner of the site. Additionally, a narrow strip of mixed woodland plantation is located along the southern boundary of the site. A small stand of Douglas Fir (*Picea abies*) is located to the east of the track leading to Wykham Park Farm Cottage (Target note 1).

B.7.62 A narrow strip of young mixed woodland plantation is also located along the footpath and bridleway leading to Wykham Farm Cottage (Target note 2). The majority of these trees comprised stems of less than 20cm in diameter. A ditch and bank are located along the centre of the plantation between the bridleway and footpath. Species present within the plantation include frequent hawthorn and field maple (*Acer campestre*) with occasionally occurring silver birch (*Betula pendula*), rose species (*Rosa* sp.), blackthorn and Scots pine (*Pinus sylvestris*).

Ponds / Watercourse

B.7.63 At the time the Extended Phase 1 Habitat survey, there were no waterbodies present on site and the watercourse shown on OS maps to be located along the southern boundary of the site was dry. No aquatic species were present to indicate that it had recently held water.

B.7.64 From a 1:10,000 OS map, six waterbodies were identified within 500m of the site (referred to as Ponds P1 – P6). The locations of these ponds are shown on Drawing Number WM10671/B7.10.

Protected Species

Flora

Protected/Notable Species

B.7.65 The initial survey undertaken by Halcrow reported no findings of legally protected rare or scarce flora species on site. Halcrow did not identify any vascular plant species recorded in the habitats within the survey area which are Red Data book

species (British Red Data Book 1: Vascular Plants, Wiggington, 1999[18)] or nationally scarce species (Scarce Plants in Britain, Stewart et al, 1994[19]). During the Extended Phase 1 Habitat Survey undertaken by Wardell Armstrong LLP, no legally protected rare or scare flora species were observed.

Invasive Species

B.7.66 The initial survey undertaken by Halcrow did not report any invasive species, as listed in the Wildlife and Countryside Act 1981 (as amended) Schedule 9, Section 14 i.e. Japanese knotweed or Indian balsam (*Impatiens glandulifera)* within the site. No invasive species were observed during the Extended Phase 1 Habitat Survey undertaken by Wardell Armstrong LLP.

Fauna

Amphibians

B.7.67 During the Extended Phase 1 Habitat Survey of the site by Wardell Armstrong, habitats that could potentially provide terrestrial habitat for amphibians were identified. It is considered that the most valuable habitats for amphibians are the woodland and hedgerows within the site.

B.7.68 From a 1:10,000 OS map, six waterbodies were identified within 500m of the site (referred to as Ponds P1 – P6). The locations of these ponds are shown on Drawing Number WM10671/B7.10.

B.7.69 Ponds P1 and P2 are located approximately 240m to the north-west of the site and Pond P3 is located approximately 240m to the west of the site. Pond P1 is located adjacent to a housing development and is visible on aerial photographs. This pond is likely to be a balancing pond. Ponds P2 and P3 are not visible on aerial photographs but could potentially be concealed by trees. This suggests that these ponds are heavily shaded by vegetation and therefore may not offer optimal conditions to support GCN.

[18] Wigginton, (1999). *British Red Data Book 1: Vascular Plants*. Joint Nature Conservation Committee, Peterborough.

[19] Stewart, A. Pearman, D.A. & Preston, C.D. (eds). (1994). *Scarce Plants in Britain*. Joint Nature Conservation Committee, Peterborough

B.7.70 Ponds P4 and P5 are located approximately 500m from the south-western corner of the site in the grounds of a school. These ponds are visible on aerial photographs and appear to be ornamental in nature.

B.7.71 The final water body (Pond P6) is situated approximately 60m to the south of the site at Wykham Farm. This pond was not visible on aerial photographs but may be concealed by trees. This suggests that the pond is heavily shaded and therefore may not offer optimal conditions to support GCN. There is also evidence that this pond may be dry. OS maps show that this pond is fed by a ditch. Part of this ditch occurs along the southern boundary of the site which was found to be heavily overgrown and dry. The ditch entered a culvert at the site boundary and appeared to continue in an easterly direction for an unknown distance downstream. The approximate diameter of the single culvert pipe is 375mm, but it was found to be almost 100% blocked (see Flood Risk Assessment). This suggests that little, if any, water has flowed along this ditch recently and therefore the water level in Pond 5 is likely to be low or not present. This would not offer suitable conditions for GCN.

Badgers

B.7.72 All information relating to badgers has been provided within the *confidential* Appendix B7.4 and is not for general public release.

Bats

B.7.73 The initial survey undertaken by Halcrow recommended detailed surveys for bats. During this survey, Halcrow identified the following trees with the potential to provide suitable roosting habitat for bats (tree reference numbers are derived from the Tree Constraints Plans contained within the Tree Survey Report which accompanies the application where given):

- A mature ash tree located in woodland adjacent to the Salt Way comprising a woodpecker hole and a trunk covered in dense ivy (No specific tree reference number given in Tree Survey);
- Two ivy clad mature ash trees in the hedgerow located to the north of Georges Barn (Tree 179 and 180); and
- A line of trees outside and adjacent to the western site boundary.

B.7.74 Therefore, emergence and dawn re-entry surveys were undertaken at these trees in August and September 2012. Additionally, foraging surveys were undertaken across the site to determine bat foraging and commuting routes across the site.

2012 Surveys

August Dusk Surveys

B.7.75 The bat surveys were undertaken over three consecutive nights 14th, 15th and 16th August 2012; the weather conditions are provided in Table B7.3 below. The transects walked and the mature trees observed during the August surveys are shown on Drawing WM10671-B7.2 (page 1). The results of the dusk surveys are shown on Drawing WM10671-B7.4.

Table B7.3 – Weather Conditions for August Dusk Surveys

Date	Weather Conditions	Wind	Cloud Cover	Temperature	Start/End time
14/08/12	Warm and dry	Light breeze	4	16	20:05/23:10
15/08/12	Cool and dry after heavy rain	Light breeze	1	16	20:06/22:52
16/08/12	Fine and dry	Very little breeze	6	15	20:05/22:45

B.7.76 On 14th August 2012 five common pipistrelles (*Pipistrellus pipistrellus*) were observed emerging from the mature ash tree located along the Salt Way at 20:45. Following this, common and soprano pipistrelles (*Pipistrellus pygmaeus*) were observed to be foraging and commuting up and down the Salt Way. During the emergence survey common and soprano pisitrelles were also observed to be foraging and commuting within the field and a noctule bat (*Nyctalus noctula*) was observed to be foraging and commuting along the field side of the Salt Way.

B.7.77 The dusk activity survey on 14th August 2012 continued on from the emergence survey at 21:35 and followed transect 1. Common and soprano pipistrelles were observed to be foraging and commuting along the majority of the transect in particular along the southern site boundary near the dry watercourse.

B.7.78 On 15th August 2012 the first bat calls during the emergence survey were not recorded until 21:01. Common pipistrelles were heard first and following this there

were multiple common pipistrelle passes and feeding activity. A few soprano pipistrelle passes were also recorded commuting along a hedgerow (Target Note H3).

B.7.79 The dusk activity survey on 15th August 2012 continued on from the emergence survey at 21:40 and followed transect 2. Common pipistrelles were observed to be commuting along the northern boundary of Wykham Farm Cottage as well as along the path leading up to the Salt Way. Soprano pipistrelle passes were also heard along the Salt Way along with a fewer common pipistrelle passes.

B.7.80 On 16th August 2012 the emergence survey was commenced at 20:05. The first bat calls were common pipistrelles and were detected at 20:49. Following this, further faint common and soprano pipistrelle passes were heard throughout the emergence survey including feeding. Additionally, a possible noctule bat was heard at 21:08 and a possible myotis bat species (*Myotis sp*.) pass was heard at 21:09.

B.7.81 The dusk activity survey on 16th August 2012 continued on from the emergence survey at 21:28 and followed Transect 3. Numerous common pipistrelle and soprano pipistrelle passes were heard along the western boundary of the site. Common and soprano pipistrelles were observed feeding along the central hedgerow (Target note H16). A few common pipistrelle passes were heard along the remaining transect. Additionally, a lot of feeding activity by both common and soprano pipistrelles was observed around the woodland just outside the north-west boundary of the site.

B.7.82 In addition a number of bats were observed on all three nights with peak frequency calls between 48 and 52khz. These are pipistrelle bats, but the species could not be determined from the sound analysis results.

August Dawn Surveys

B.7.83 The dawn surveys were undertaken over three consecutive mornings 15th, 16th and 17th August 2012; the weather conditions are provided in Table B7.4 below. The transects walked and the mature trees observed during the August surveys are shown on Drawing WM10671-B7.2 (page 2). The results of the dawn surveys are shown on Drawing WM10671-B7.5.

Table B7.4 – Weather Conditions for August Dawn Surveys

Date	Weather Conditions	Wind	Cloud Cover	Temperature	Start/End time
15/08/12	Clear and fine	Slight breeze	3	18	04:12/06:13
16/08/12	Fine rain clearing to be dry and fine	Light breeze	6	16	04:15/06:06
17/08/12	Clear and dry	Light breeze with stronger gusts	7	17	04:10/06:05

B.7.84 On 15th August the dawn activity survey followed Transect 1. Two common pipistrelles were observed foraging from the start of the survey along hedgerow H2. Common pipistrelle calls were heard along the southern boundary and Hedgerow H16 and one soprano pipistrelle was detected along the southern boundary.

B.7.85 The dawn re-entry survey commenced at 04.59. At the mature ash tree from 04.59 onwards two common pipistrelles were observed to be foraging up and down the path. A soprano pipistrelle pass was also detected. At 05:16 two common pipistrelle bats were observed to enter the mature tree. Further common pipistrelle bats were observed to be feeding and circling around the tree and along the path. At 05:19 a third common pipistrelle was observed entering the tree and a fourth individual entered the tree at 05:20. No further bats were observed entering the tree.

B.7.86 On 16th August the dawn activity survey followed Transect 2. Common and soprano pipistrelles were observed from the start of the survey to be feeding along hedgerow H3. Further common and soprano pipistrelle passes and feeding activity was observed along the remaining transect route including along the Salt Way, the bridle path within the plantation and the hedgerow (Target note H4).

B.7.87 The dawn re-entry survey commenced at 5:06. A faint common pipistrelle pass was heard at the start and at 05:08 near the mature ash tree but no bats were seen entering the tree. No further bats were detected or observed.

B.7.88 On 17th August the dawn activity survey was commenced at 04:10 and followed transect 3. Numerous common pipistrelle passes and feeding activity was observed from the start of the survey along the Salt Way track. A minimum of two individuals were observed. Further common pipistrelle passes were heard along the northern

site boundary, hedgerows H11, H15 and H16. During the activity survey, a common pipistrelle bat was observed from 05:00 to be swarming around the mature pedunculate oak tree (Tree 165) located along the southern site boundary until 05:04 when it entered the tree.

B.7.89 The dawn re-entry survey was commenced at 05:25. No bats were observed or detected during this survey.

September Dusk Surveys

B.7.90 The bat surveys were undertaken over three consecutive nights 11th, 12th and 13th September 2012; the weather conditions are provided in Table B7.5 below. The results of the September dusk surveys are shown on Drawing WM10671-B7.6. The transects walked and the mature trees observed during the September surveys are shown on Drawing WM10671-B7.3.

Table B7.5 – Weather Conditions for September Dusk Surveys

Date	Weather	Wind	Cloud Cover	Temperature	Start/End time
11/09/12	Cool and dry	Slight breeze and occasional stronger gusts	3	12	19:14
12/09/12	Heavy rain at start but lightened and had stopped by 19:45	Light breeze with occasional stronger gusts	8	11	19:20 (waited for heavy rain to slow)
13/09/12	Clear and dry	Light breeze	2	12	19:05

B.7.91 On 11th September the emergence survey was commenced at 19:14. The first bat calls were heard at 19:55, these were from common pipistrelles and soprano pipistrelles. From then onwards, common pipistrelle and soprano pipistrelle passes were heard at regular intervals and observed flying between the mature trees from north to south and return. At least two individuals were observed. In addition, one pipistrelle bat was observed entering one of the mature trees (Tree 139) indicating a potential night or feeding roost.

B.7.92 The dusk activity survey was commenced at 20:24 and followed Transect 3. Common pipistrelles continued to forage along the western boundary of the site.

Bats were also detected in the north-western corner of the site to the south of the woodland as well as a single pass along hedgerow H16.

B.7.93 On 12th September at the first mature tree, the first bat calls were detected at 19:44 these were common pipistrelles; however, the common pipistrelles were not seen. At regular intervals onwards a number of short common pipistrelle passes were heard. From 20:01 onwards, numerous, almost continuous, common pipistrelle passes as well as feeding activity and soprano pipistrelle passes were detected. At least two individuals were observed. At 20:39 a common pipistrelles bat pass was heard. At the second mature tree, the first bat calls were heard at 19:43 but the common pipistrelles were not seen. Continuous calls were heard for the remainder of the emergence survey.

B.7.94 The dusk activity survey was commenced at 20:46 and followed Transect 1. Common pipistrelles and soprano pipistrelles were observed to be commuting along the southern boundary of the site as well as along the Salt Way along the northern boundary and along hedgerow H2.

B.7.95 On 13th September the emergence survey was commenced at 19:05. At the mature ash tree, the first bat pass was detected at 20:00. From 20:03 until 20:26 continuous common pipistrelle and soprano pipistrelle activity including feeding activity was heard and bats were observed foraging along the hedgerow. Following this, a number of individual common pipistrelle passes were heard. At the second mature ash tree, a single common pipistrelle bat pass was detected at 19:59 and one individual was observed leaving the canopy of the ash tree (Tree 179). Several faint common pipistrelle and soprano pipistrelle bat passes were heard sporadically following this until the end of the emergence survey.

B.7.96 The dusk activity survey was commenced at 20:37 and followed Transect 2. Common pipistrelles and soprano pipistrelles were detected along the path leading from Wykham Farm Cottage to the Salt Way. Additionally, common pipistrelles and soprano pipistrelles were observed feeding along the Salt Way and hedgerow H2.

September Dawn Surveys

B.7.97 The dawn surveys were undertaken over three consecutive mornings 12th, 13th and 14th September 2012; the weather conditions are provided in Table B7.6 below. The

results of the dawn surveys are shown on Drawing WM10671-B7.7. The transects walked and the mature trees observed during the September surveys are shown on Drawing WM10671-B7.3.

Table B7.6 – Weather Conditions for September Dawn Surveys

Date	Weather Conditions	Wind	Cloud Cover	Temperature	Start/End time
12/09/12	Clear and dry	Light breeze	2	8	05:03
13/09/12	Cool and dry	Light breeze	4	10	05:05
14/09/12	Cool and dry	Occasional gusts	4	15	05:10

B.7.98 On 12th September the dawn activity survey was commenced at 05:03 and followed Transect 3. No bats were detected throughout the survey.

B.7.99 The dawn re-entry survey was commenced at 05:57. A single common pipistrelle bat pass was detected at 5:05. No further bats were observed during the survey.

B.7.100 On 13th September the dawn activity survey was commenced at 05:05 and followed Transect 1. No bats were detected throughout the survey.

B.7.101 The dawn re-entry survey was commenced at 5:50. No bats were detected at either location.

B.7.102 On 14th September the dawn activity survey was commenced at 05:10 and followed transect 2. Common pipistrelles were observed commuting along the Salt Way track, hedgerow H2 and along the northern boundary of Wykham Farm Cottage.

B.7.103 The dawn re-entry survey was commenced at 05:42. Several individual common pipistrelles were observed commuting and foraging along the northern boundary of Wykham Farm Cottage at the beginning of the survey and some soprano pipistrelles were heard between 05:55 and 06:00; however, no further activity was observed from 06:08.

Birds

B.7.104 The hedgerows, mature trees and broad-leaved woodland have the potential to support a variety of tree nesting birds. The arable fields have the potential to support ground-nesting birds. During the Extended Phase 1 Habitat Survey

undertaken by Wardell Armstrong LLP, the following incidental bird sightings were recorded: kestrel, wood pigeon and chaffinch.

Brown Hare

B.7.105 No brown hares were observed during the Extended Phase 1 Habitat Survey undertaken by Wardell Armstrong LLP. However, the arable fields could provide suitable habitat for brown hares within the site.

Dormouse

B.7.106 Dormice have a varied diet but nuts including hazel, beech and chestnuts are particularly important food sources before hibernation. Other important species include honeysuckle and bramble. Halcrow did not consider dormice to be a constraint to the development and therefore no dormouse surveys were recommended following the initial survey. Additionally, TVERC holds no records of dormice within 2km of the site. Extensive woodland and hedgerows with a range of food plants that are suitable for dormice were not recorded during the Extended Phase 1 Habitat Survey.

Hedgehog

B.7.107 No evidence of hedgehogs was observed during the Extended Phase 1 Habitat Survey undertaken by Wardell Armstrong LLP. However, the hedgerows and woodland located on site have the potential to provide suitable resting and foraging habitat for hedgehogs.

Invertebrates

B.7.108 The arable fields are unlikely to support a notable assemblage of invertebrates. The hedgerows and broad-leaved woodland offer the most value for invertebrates within the site. During the Extended Phase 1 Habitat Survey undertaken by Wardell Armstrong LLP, cabbage white (*Pieris sp.*) and peacock (*Inachis io*) butterflies were observed on site.

Reptiles

B.7.109 Halcrow did not consider reptiles to be a constraint to the development and therefore no reptile surveys were recommended following the initial survey. During the Extended Phase 1 Habitat Survey undertaken by Wardell Armstrong LLP in

August 2012, a grass snake was observed along the northern boundary of the site by the Salt Way. This location is close to residential gardens and parkland which are likely to provide more suitable habitat for grass snake than the habitats on site.

B.7.110 A presence / absence survey for reptiles was not considered necessary, as the presence of grass snakes has been confirmed due to this incidental sighting. From the habitats present on site, it is considered highly likely that reptiles are limited to the hedgerows and field margins only as a large proportion of the site comprises arable fields which are considered unsuitable for reptiles. There is potential for other reptile species to be on site as well as grass snake, however, given the limited extent of suitable habitats present on site it is expected that any reptile population present is likely to be small and limited to the hedgerows and field margins only.

Other wildlife

B.7.111 Unidentified deer and red fox (*Vulpes vulpes*) were recorded within the site during the walk over survey.

Nature Conservation Evaluation

Nature Conservation Evaluation Criteria

B.7.112 The assessment of the nature conservation value of the survey area has been based on the initial survey undertaken by Halcrow, the Extended Phase 1 Habitat Survey and the widely applied criteria described in '*A Nature Conservation Review*' (Ratcliffe, 1977)[20]. A summary of these criteria is set out in Appendix B7.6.

B.7.113 The nature conservation value of an area of land is usually assessed in terms of international, national, regional/county, district, local (parish) and negligible value:

- **International value** (Special Areas of Conservation, Special Protection Areas, Ramsar sites);
- **National value** (Sites of Special Scientific Interest);
- **Regional/county value** (Local Nature Reserves, Sites of Importance for Nature Conservation, ancient woodlands);
- **District or local (parish) value** (significant ecological features such as old hedges, mature and semi-mature woodlands, ponds);

[20] Ratcliffe, D.A. (1977). *A Nature Conservation Review*. Cambridge University Press, Cambridge.

- **Neighbourhood value**, i.e. of value within the context of the survey area, (e.g. small areas of semi-improved grassland, isolated mature trees);
- **Negligible value** (usually applied to areas of built development, active mineral extraction, or intensive agricultural land).

B.7.114 Species are evaluated based on their rarity, population size and whether they are especially important to the functioning of an ecosystem. Though they may not be protected or particularly rare, consideration is also given to those species listed in the UKBAP as well as the Oxfordshire Local BAP.

Nature Conservation Designations

B.7.115 Information received from MAGIC and TVERC has revealed that there are no statutory designations within 2km of the site. Information received from TVERC however has revealed the presence of one Local Wildlife Site (LWS) within 2 km of the site.

B.7.116 Local Wildlife Sites are equivalent to Sites of Importance for Nature Conservation. Therefore, Bretch LWS is considered to be of at least county value for nature conservation.

Habitats

Arable Fields

B.7.117 The arable fields are considered to be of negligible value for nature conservation as they are species poor and under intensive agricultural use. However, they may support ground-nesting birds and could potentially be of some foraging value for badgers and other wildlife and therefore do hold some value for some species.

Hedgerows

B.7.118 Hedgerows have the potential to provide foraging, breeding and resting opportunities for a range of wildlife and can act as corridors for wildlife through ecologically poor areas. In particular, they are being used by at least three species of bat. The majority of the hedgerows meet the UKBAP priority habitat criteria and six appear to meet the criteria for 'important' hedgerows under the wildlife and landscape criteria of the Hedgerow Regulations 1997.

B.7.119 The criteria are complex, and include hedgerows which have 7 woody species; hedgerows with 6 woody species plus at least 3 of the features identified in sub-paragraph 4 of the criteria (e.g. one standard tree for every 50m hedgerow length); or at least five woody species and at least 4 of the features specified in sub-paragraph 4. The application of the criteria to the hedgerows on site relates mainly to the flora species present and is not an exhaustive assessment. Appendix B7.3 details the results of the application of the criteria to determine the potential for 'important' hedgerows under the wildlife and landscape criteria. The hedgerows have not been considered under the archaeology and history criteria of the Hedgerow Regulations 1997. Six hedgerows (Target notes H1, H2, H4, H12, H15 and H16) are considered to be of at least local value for nature conservation.

B.7.120 The remaining hedgerows within the site are not considered to be 'important' under the wildlife and landscape criteria of the Hedgerow Regulations 1997. However, they do provide wildlife corridors and foraging opportunities for a range of species including at least three bat species as well as suitable nesting habitat for a range of breeding birds. Therefore, these hedgerows are considered to be of local value to nature conservation.

Mature/Semi mature trees

B.7.121 There are a numerous mature/semi-mature trees on site which are associated with hedgerows. These trees are considered to be of neighbourhood value due to their potential value for wildlife, particularly breeding birds.

B.7.122 The 2012 bat surveys confirmed the presence of bat roosts within four mature trees on site, as shown on Drawing WM10671-B7.4 to WM10671-B7.7. The potential night/feeding roost located along the western edge (Tree 139) and the minor common pipistrelle roost along the southern boundary (Tree 165) are located in mature pedunculate oak trees whereas the minor common pipistrelle roost along the northern boundary adjacent to the Salt Way and the minor pipistrelle roost to the north of Wykham Farm Cottage (Tree 179) are located in mature ash trees. Five common pipistrelles in total were seen emerging from the ash tree on the Salt Way. The other trees are roosts to at least one bat. These tree roosts are considered to be minor roosts, probably of individual or a small number of bats. These four mature trees are considered to be of at least local value for nature conservation. Due to the

density of trees along the western site boundary and the level of bat activity immediately after dusk, it is possible that further tree roosts could exist along this boundary.

Broad-leaved Woodland / Mixed Plantation

B.7.123 The small area of broad-leaved woodland just outside the north-western corner of the site, the strip of mixed plantation along the southern boundary, the mixed plantation along the path leading to Wykham Farm Cottage as well as the small stand of Douglas Fir provide foraging, shelter and nesting opportunities for small mammals, amphibians, possibly reptiles, badgers, birds and bats. These areas are therefore considered to be of local value in the context of the predominantly intensive agricultural nature of the site.

Ponds / Watercourse

B.7.124 No waterbodies are present within the site.

B.7.125 The water quality of the ditches/watercourses within the site that drain to the Sor Brook are considered likely to be relatively poor due to regular clearance and dredging in line with the agricultural drainage function they perform. Such maintenance activities will prevent the long term establishment of any ecology in addition to stirring up suspended sediment leading to the deterioration of water quality. In addition the frequent use of agricultural chemicals and runoff from adjacent farming land and farm yards would further contribute to the deterioration of water quality which can be exacerbated by seasonally low flows. The ditches/watercourses within the site are therefore considered to be of negligible value for nature conservation.

Protected Species

Flora

Protected / Notable Species

B.7.126 During the initial survey undertaken by Halcrow and the Extended Phase 1 Habitat Survey undertaken by Wardell Armstrong LLP, no legally protected, rare or scarce flora species were recorded on the site. Therefore, the habitats on the site are considered to be of negligible value for protected flora species, although it is

possible that some locally notable species may occur in the hedgerows or woodland habitats.

Invasive Species

B.7.127 No invasive species were observed within the site.

Fauna

Amphibians

B.7.128 No waterbodies are located within site. From a 1:10,000 OS map, six waterbodies were identified within 500m of the site. These ponds, if present, have the potential to be utilised by amphibians for breeding and foraging.

B.7.129 There were no records for GCN within 2km of the site. The habitats on site could potentially provide terrestrial habitat for amphibians including GCN (if present in the off-site ponds), however the most valuable habitats for amphibians would be the woodland and hedgerows within the site. Therefore, the hedgerows and woodland habitats within the site are assessed as being of neighbourhood value for amphibians including for GCN, if present.

Badgers

B.7.130 All information relating to badgers has been provided within the *confidential* Appendix B7.4 and is not for general public release.

Bats

B.7.131 Two mature pedunculate oak trees and two mature ash trees located on site are were being used by common pipistrelles as roost sites. These tree roosts are considered to be minor roosts for individual or a small number of common pipistrelle bats. The roost in Tree 139 on the western boundary of the site could potentially be a night/feeding roost for pipistrelle bats. As roosting bats are present within these trees, these trees are considered to be of at least local value for common pipistrelle bats.

B.7.132 Additionally, the hedgerows provide suitable foraging habitat and navigation routes for bats. The bat surveys undertaken in 2012 recorded at least four species of bat (common pipistrelle, soprano pipistrelle, noctule and a *Myotis* species) foraging and

commuting along the hedgerows and woodland edges throughout the site with the most activity predominantly along the hedgerows and woodland edges along the site boundaries. Overall, the site is considered to be of local value for at least four species of bat for foraging/commuting.

Birds

B.7.133 The site provides breeding, feeding and nesting opportunities for bird species. The hedgerows and areas of woodland within the site are important for breeding birds and are therefore considered to be of local importance for breeding birds. The open fields, although of less value for birds, do provide nesting opportunities for ground nesting birds such as skylark and therefore could potentially be of local importance for these species.

Brown Hare

B.7.134 The fields of arable crop and the hedgerows may offer potential sheltering and foraging habitat for brown hares with open farmland providing suitable habitat for these species and are therefore considered to be of neighbourhood value for brown hare.

Dormouse

B.7.135 Due to a lack of extensive woodland and suitable hedgerows with a range of food plants for dormice within the site and the absence of dormouse records in the local area, the site is considered to be of negligible value for dormouse.

Hedgehog

B.7.136 The hedgerows and areas of woodland could potentially provide suitable resting and foraging habitat for hedgehogs and therefore the habitats within the site are considered to be of neighbourhood value for hedgehogs.

Invertebrates

B.7.137 The hedgerows, mature trees and woodlands have the potential to support a range of invertebrates within the site. Therefore, these habitats within the site are considered to be of neighbourhood value for invertebrates; however the majority of the site comprises arable land which is considered to be of less value for invertebrates.

Reptiles

B.7.138 The presence of a grass snake was confirmed due to an incidental sighting during the walk over survey. From the habitats present on site, it is considered highly likely that reptiles are limited to the hedgerows and field margins only as a large proportion of the site comprises arable fields which are considered unsuitable for reptiles. There is potential for other reptile species to be on site as well as grass snake, however, given the limited extent of suitable habitats present on site it is expected that the reptile population would be small and limited to the hedgerows and field margins only.

B.7.139 Therefore, the majority of the site is considered to have negligible value for common reptiles. The hedgerows and field margins provide limited habitat for common reptile species and are therefore considered to be of neighbourhood value for a small number of common reptiles.

Other fauna

B.7.140 As there are no watercourses on site, the habitats within the site are considered to have no potential for otter, water vole or white-clawed crayfish. It is considered that the habitats are of negligible value for these species.

B.7.141 The woodland and farmland within the site provide foraging and shelter opportunities for deer and foxes and as such the site is of local value for these species.

Summary of Nature Conservation Value

B.7.142 Table B7.7 below summarises the nature conservation evaluation of the site. Overall the majority of the area is of negligible value for nature conservation in a local context because it is for the most part intensively used agricultural land. The hedgerows and woodland areas are significant in a local context both in providing shelter, foraging and nesting opportunities for a range of fauna species.

Table B7.7: Summary of Nature Conservation Evaluation

Habitat/Fauna	Comments	Nature Conservation Value
Nature Conservation Designations		
Local Wildlife Site	Bretch	At least county
Habitats		
Arable fields	May support breeding birds and be of foraging value for other wildlife. Species poor and intensively farmed.	Negligible
Hedgerows	6 potentially 'important' hedgerows Other hedgerows – provide wildlife corridors, foraging and nesting opportunities for wildlife including bats and birds.	At least local Local
Mature/Semi mature trees	Particularly important for breeding birds Four mature trees with confirmed bat roosts	Neighbourhood At least local
Broad-leaved Woodland / Mixed Plantation	Suitable foraging, sheltering and nesting habitat for range of speices	Local
Ponds / Watercourse	None waterbodies present on site Ditches/minor watercourses	Negligible
Flora		
Protected species	No protected species recorded	Negligible
Invasive Species	No invasive species recorded	Negligible
Fauna		
Amphibians	Hedgerows, broad-leaved woodland and mixed plantation could provide suitable habitat for amphibians	Neighbourhood
Badger	See ***confidential*** Appendix C3.4	
Bats	Mature trees with confirmed bat roosts At least four species of bat utilising	At least local

Habitat/Fauna	Comments	Nature Conservation Value
	hedgerows and woodland edges for commuting and foraging.	Local
Birds	Hedgerows, mature trees and woodlands provide suitable breeding and foraging habitat. Arable land provides suitable habitat for some ground-nesting birds.	Local
Brown Hare	Potential sheltering and foraging habitat	Neighbourhood
Dormouse	Lack of extensive woodland and hedgerows with a range of food-plants for dormice.	Negligible
Hedgehog	Hedgerows and areas of woodland provides suitable habitat	Neighbourhood
Invertebrates	Potential for locally notable species in hedgerows, mature trees and areas of woodland	Neighbourhood
Reptiles	Hedgerows and field margins provide limited habitat for common reptiles	Neighbourhood
Otter, water vole and white-clawed crayfish	No suitable habitats present	Negligible
Other fauna	Habitats have potential to support deer and foxes	Local

Potential Impacts

Impact Assessment Criteria

B.7.143 The assessment of the impacts of the proposed development needs to take into account both on-site impacts as well as those which may affect adjacent areas of nature conservation value. Impacts can be permanent or temporary and can include:

- Direct loss of wildlife habitats;
- Fragmentation and isolation of habitats;

- Disturbance to species;
- Changes to the local hydrology and/or water quality.

B.7.144 The significance of an adverse impact (or a beneficial result) is the product of the magnitude of the impact and the value or sensitivity of the nature conservation resources affected. There is no agreed method for assessing the significance of adverse impacts on nature conservation receptors. Nevertheless, high levels of significance will generally be ascribed to large impacts on receptors of high nature conservation value. Low levels of significance will generally be ascribed to small impacts on receptors of high nature conservation value or large impacts on receptors of low or negligible nature conservation value.

B.7.145 The significance of the potential impacts has been assessed using the following criteria:

Major (or severe) impact
Loss of or permanent damage to any part of a nationally important site, or a substantial part or key feature of a site of county importance, or the whole of a site of local importance. Loss of a legally protected, nationally rare or nationally scarce species from the site or its immediate vicinity.

Moderate impact
Loss of or permanent damage to any part of a site of county importance, or a substantial part or key feature of a site of local importance. A substantial reduction in the numbers of legally protected, nationally rare, nationally scarce species on the site or its immediate vicinity. The loss of, or very substantial reduction in the population of, a rare species (regional/county level) from the site or its immediate vicinity.

Minor impact
Loss of or permanent damage to any part of a site of local importance. A reduction in the population of legally protected, nationally rare, nationally scarce or rare (regional/county level) species on the site or its immediate vicinity.

Negligible impact

Temporary damage to a small part of a site of local importance or loss of or damage to land of negligible nature conservation value. No reduction in the population of legally protected, nationally rare, nationally scarce or notable (regional/county level) species on the site or its immediate vicinity.

B.7.146 It is also important to consider the likelihood of a change/activity occurring as predicted and also the degree of confidence in the assessment of the impact on ecological structure and function[21]. Based on guidance provided in the Institute of Ecology and Environmental Management's (IEEM) document '*Guidelines for Ecological Impact Assessment in the United Kingdom*' 2006 the following confidence in prediction scale is used in this assessment:

- **Certain/near-Certain:** probability estimated at 95% chance or higher
- **Probable:** probability estimated at 50% but below 95%
- **Unlikely:** probability estimated above 5% but less than 50%
- **Extremely Unlikely:** probability estimated at less than 5%

Nature Conservation Designations

B.7.147 There are no statutory designations within 2km of the site.

B.7.148 Due to the distance between the site and the Local Wildlife Site (approximately 1.2km), no direct or indirect effects on this site is anticipated.

Potential Impacts on the Site

B.7.149 The following impacts have been identified as those which the proposed development could potentially have *in the absence of mitigation measures*.

B.7.150 The proposed development of the site will comprise residential education and employment areas, areas of public open space and a local centre, with associated infrastructure, landscaping and drainage channels.

[21] Guidelines for Ecological Impact Assessment in the United Kingdom. IEEM, 2006.

B.7.151 During the construction phases, there will be disturbance to habitats and wildlife from construction operations, e.g. removal of topsoil and clearance of vegetation. After construction, the area will be urban in character with a higher level of human activity thus resulting in greater disturbance to wildlife than at present.

B.7.152 The approximate areas of existing habitats and allocated land use after development is summarised in the table below.

Habitats

Table B7.8 – Approximate Habitats / Land Use Before and After Development

Habitat / Land Use	Pre-development in ha – except linear features (m)	After Development in ha – except linear features (m)
Arable	47.83ha	-
Mixed Plantation	2.27ha	2.27ha
Semi-natural broad-leaved woodland	0.21ha	0.21ha
Hedgerows	4120m	3622m - retained 298 – new
Ditch	788m	898m
Open Space	-	11.48
Education	-	2.22
Local Centre	-	0.75
Residential	-	30.03
Employment	-	1.67
Infrastructure	-	1.68
TOTAL	50.31	50.31

Arable Fields

B.7.153 All of the arable land, approximately 47.83ha, will be lost to the development and replaced by residential, education and employment areas, areas of public open space and a local centre, with associated infrastructure, landscaping and drainage channels. The arable fields are species poor, but may support a low number of ground-nesting birds such as skylark and may be used by small mammals and brown hare although the habitats are not optimal. It is therefore considered *probable* that the loss of the arable fields will have an overall negligible adverse impact on nature conservation at a local level.

B.7.154 Impacts on ground-nesting birds are discussed later in this section.

Hedgerows

B.7.155 The development will result in the removal of approximately 498m of existing hedgerow habitat. This includes 310m from the northern section of hedgerow H13 and 110m of the western section of hedgerow H16. The construction of roads and a roundabout will also introduce breaks (approximately 78m in total) into three other hedgerows (H12, H15 and H16). The remaining 3622m of hedgerow will be retained within the development.

B.7.156 Overall, the development will result in a loss of 498m of hedgerow out of a total of 4120m equating to 12% loss of hedgerows from the site.

B.7.157 The hedgerows are considered to be of local value to nature conservation and four of the hedgerows affected could be considered to be 'important' under the Hedgerow Regulations 1997. It is therefore considered *certain/near-certain* that the permanent loss of approximately 12% of hedgerows and the fragmentation of some of the hedgerow network across the centre of the site will result in adverse impacts of minor significance at a local level and have implications for local wildlife such as bats and birds which are discussed later in this section.

B.7.158 There is a risk that construction works within the crown spread of retained hedgerows could damage the roots of the hedgerows if no protection measures are undertaken. This would result in a *probable* minor to moderate adverse impact on the retained hedgerows at a local level.

Mature/Semi mature trees

B.7.159 Mature and semi-mature trees are associated with hedgerows on site. The development will result in the loss of some of the mature trees associated with hedgerows H12 and H13. The loss of these trees represents a *certain/near-certain* adverse impact of minor significance on nature conservation at a local level. However, there is potential for further bat roosts to be present in the mature trees located in H12 and therefore the severity of the adverse impact predicted from the loss of mature trees could be greater.

B.7.160 There is a risk that construction works within the crown spread of retained mature or semi-mature trees could damage these trees if no protection measures are undertaken resulting in a *probable* minor adverse impact on these trees at a local level.

Broad-leaved woodland/mixed plantation

B.7.161 The semi-natural broad-leaved woodland is located outside of the application boundary and the mixed plantation is being retained as part of the development. However, there is a risk that construction works within the crown spread of the woodland and retained mixed plantation could damage these trees if no protection measures are undertaken, resulting in a probable minor adverse impact on the woodland and mixed plantation at a local level.

B.7.162 The stand of Douglas Fir will be lost to the development. These trees are non-native and therefore their loss is not considered to be significant in terms of nature conservation, although they may have some value for a low number of breeding birds.

Ditches/minor watercourses

B.7.163 The existing ditches/minor watercourse that flows from within the centre of the proposed development site and then east toward Wykham Farm will be retained as part of the development. The ditches/watercourses within the site were dry at the time of the 2012 walkover survey. The Water Environment Chapter (Chapter B3) indicates that they are likely to have variable flow and have no flow during dry periods. The Water Environment Chapter also indicates that the watercourse is a tributary of the Sor Brook, located 500m to the south of the site. The ecological status of the brook is considered to be good.

B.7.164 The water quality within the ditches/watercourses could potentially be adversely affected during the construction works as a result of the following:

- Exposure of bare ground, earth movement, mobilising of sediment into surface water receptors through runoff from the site;
- Wheel washing run-off, or muddy run-off from highways and construction access tracks within the site;
- Pollution due to vandalism of stores or plant;

- Poor/inappropriate storage of materials and chemicals/fuels and wastes such as on permeable surfaces, adjacent to watercourses or without sufficient bunding capacity;
- Accidental spillages of fuels and polluting materials such as concrete;
- Creation of preferential pathways via piling operations, drainage schemes and services corridors; and
- Pumping of silt-laden surface water or groundwater accumulated on the application site or via de-watering directly into controlled waters.

B.7.165 There is also a potential for the water quality of the ditches/minor watercourses to be affected post-construction due to the following:

- Sediment within surface water runoff;
- Contaminants from vehicle movements within the site (i.e. pollutants within the runoff from hard standing areas such as roads and parking areas);
- Accidental spillages; and
- Discharge of wastes, chemicals or foul water to surface water sewer drains or ground.

B.7.166 The severity of adverse impacts on the ditches/minor watercourses could potentially be minor to major at a local level depending on the scale and longevity of the pollution event. Such an impact should however not affect the Sor Brook as there is a reservoir located between the watercourse and the Sor Brook to the south of Wykham Lane which will sufficiently slow flows to allow any suspended sediment to settle out before reaching the brook.

B.7.167 The removal of the application site from agricultural production will reduce the level of agricultural chemicals discharged into the ditches/minor watercourses. This reduction in nutrient and pesticide input is considered *probable* to have a minor beneficial impact on the water quality within the ditches/minor watercourses at a site level, providing that no pollution events occur from surface runoff entering the ditches/watercourses post-construction which could have adverse impacts on water quality. This beneficial impact is considered *probable* to be negligible for the Sor Brook due to the size of its contributing catchment and surrounding agricultural land use.

Protected Species

Protected / Notable Species

B.7.168 No legally protected, rare or scarce flora species were recorded within the application site during the Extended Phase 1 Habitat Survey. It is therefore considered probable that the proposed development will have a negligible adverse impact on these flora species.

Invasive Species

B.7.169 No invasive species were observed within the application site and therefore no impacts are anticipated.

Fauna

Amphibians

B.7.170 The site is considered to offer limited terrestrial habitat for amphibians, including GCN (if present), with the hedgerows and woodland being the most valuable habitats within the site.

B.7.171 TVERC hold no records of GCN within 2km of the site. OS maps and aerial photographs revealed six waterbodies within 500m of the site (referred to as Ponds P1 – P6). The locations of these ponds are shown on Drawing Number WM10671/B7.10. No GCN surveys have been undertaken at these ponds as the Extended Phase 1 Habitat Survey by Wardell Armstrong LLP was carried out after the 2012 GCN survey season.

B.7.172 The planning authority has a responsibility to consider the "Three Tests" under the Conservation of Habitats and Species (Amendment) Regulations 2012 when determining a planning application where there is a potential for an European Protected Species (EPS) to be affected. The first two tests relate to the need for the development and the existence of alternatives. The third test (under Regulation 53 (9)(b) of the Conservation of Habitats and Species (Amendment) Regulations 2012) considers whether the proposed development will result in significant impacts on the favourable conservation status of a European Protected Species. In order to do this, if an EPS is present, it must be demonstrated that adequate compensation and mitigation can be put in place as part of the development so that the conservation status of the species is maintained.

B.7.173 In addition, in order to comply with the Town and Country Planning (Environmental Impact Assessment Regulations) (England and Wales) Regulations 1999, the Environmental Statement must include information which identifies all likely significant effects of the development on the environment and describe the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment. In the absence of survey information on Ponds P1 – P6, it is possible to assess potential impacts on GCN based on the available evidence on the habitats present both on and off-site, combined with information on GCN ecology. A suitable mitigation strategy can be proposed and implemented should GCN be present which will ensure that residual impacts on GCN after mitigation are negligible.

B.7.174 In order to assess the potential impacts on GCN, should this species be present, available evidence on the ponds and their immediate surroundings, intervening habitats between the ponds and the site and the habitats located on site has been considered.

Ponds

Ponds P1, P2 & P3

B.7.175 Pond P2 and P3 are not visible on aerial photographs but could potentially be present but concealed by trees. This suggests that these ponds are heavily shaded by vegetation and therefore may not offer optimal conditions for GCN.

B.7.176 However, if GCN are present in Ponds P1 - P3, research has shown that the majority of a GCN population remains very close to its breeding ponds (with most adults captured within 50m of ponds during pitfall trapping operations and very few animals captured at distances greater than 100m).22 These ponds are located over 240m from the site and therefore it is anticipated that a significant proportion of any GCN population present at these ponds would be found in the habitats in the immediate vicinity of the ponds and not in limited terrestrial habitat within the site.

[22] English Nature (2004) *English Nature Research Report 576: An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt* Triturus cristatus. English Nature, Peterbrough.

B.7.177 The Natural England Consultation letter (dated 11th October 2012) submitted in response to the planning application (Reference Number 12/00080/OUT) for the Horgan Land adjacent to the site did not refer the planning authority to their standing advice for great crested newts, suggesting that great crested newts were not considered an issue for this development. Ponds P1 - P3 fall within 500m of the Horgan Land proposed development.

Ponds P4 & P5

B.7.178 Aerial photographs suggest that more suitable habitats for GCN are located in the immediate surroundings of Ponds P4 and P5 e.g. woodland, fields of grassland, hedgerows and the school grounds and, as stated above, research has shown that the majority of a GCN population remains very close to the breeding pond. This is particularly relevant if suitable terrestrial habitats are present in the vicinity of the ponds. P4 and P5 are located 500m from the site's southern boundary and therefore it is anticipated that a significant proportion of any GCN population which may be present at these ponds would be found in the habitats in the immediate vicinity of the ponds and not in limited terrestrial habitat within the site 500m away.

Pond P6

B.7.179 The nearest water body (Pond P6) shown on OS maps is located 60m from the site at Wykham Park Farm. Due to access restrictions, this pond could not be assessed for its suitability for GCN. This pond was not visible on aerial photographs but could be present but concealed by trees. This suggests that the pond is heavily shaded and therefore may not offer optimal conditions to support GCN. There is also evidence that this pond may be dry. OS maps show that this pond is fed by a ditch. Part of this ditch occurs along the southern boundary of the site which was found to be heavily overgrown and dry. The ditch entered a culvert at the site boundary and appeared to continue in an easterly direction for an unknown distance downstream. The approximate diameter of the single culvert pipe is 375mm, but was found to be almost 100% blocked (see Flood Risk Assessment). This suggests that little, if any, water has flowed along this ditch recently and therefore the water level in the Pond P5 is likely to be low or not present which would not offer suitable conditions for GCN.

B.7.180 From aerial photographs, it also appears that habitats which occur in the immediate surroundings of this pond, which include gardens and a field of grassland could potentially be of more value to GCN, as opposed to the arable land on site. It is therefore considered likely that a significant proportion of any GCN population which may be using this pond would be using the immediate habitats around the pond rather than the limited terrestrial habitats on site.

Intervening Habitats

B.7.181 The A361 occurs between Ponds P1 – P3 which could form a significant barrier to GCN dispersal into the site. GCN would also have to cross arable land in order to enter the site.

B.7.182 Ponds P4 and P5 are separated from the site by Wykham Lane and an area of arable land which GCN may not disperse across in order to enter the site.

B.7.183 There are no significant barriers to dispersal between the site and Pond P6.

Habitats on-site

B.7.184 The site is considered to offer limited terrestrial habitat for amphibians, including GCN should they be present, with the hedgerows and woodland being the most valuable habitats within the site. If GCN were present on site, it is likely that their distribution on site would be mainly restricted to these habitats.

Potential Impacts on Amphibians

B.7.185 Given the above factors, should GCN be present within the ponds, it is considered likely that only a very small number of GCN from the populations based at the off-site ponds would be present in the site and also that these individuals would mainly be restricted to the hedgerows and woodland habitats within the site.

B.7.186 The proposed development on site is therefore considered to have two main potential impacts on GCN should they be present in the off-site ponds. These are loss of potential terrestrial habitat and harm/disturbance to individual GCN during site clearance works.

B.7.187 The woodland habitats and the majority of the hedgerows are being retained as part of the development. It is considered probable that the small loss of hedgerow

habitat (12%) to the development will have negligible impacts on GCN should they be present in the off-site ponds as more suitable terrestrial habitats are present in the vicinity of the ponds and hedgerow habitats also occur in the surrounding area.

B.7.188 Individual GCN could potentially be harmed /disturbed if present when site clearance works are being undertaken. If any GCN populations should be present at Ponds P1 – P5, for the reasons given above, it is considered extremely unlikely that any GCN from these ponds would be present within the parts of the site that fall within 500m of these ponds. In relation to Ponds P4 and P5, the only part of the site to fall within 500m of these ponds would be a short section of the southern boundary which is being retained. The risk of harm and disturbance to any GCN which may be present in Ponds P1 – P5 is therefore considered to be low. It is therefore considered probable that the impacts of harm and disturbance on individual GCN, if present in Ponds P1 – P5, will be negligible and thus the site clearance operations are considered unlikely to affect the favourable conservation status of GCN populations in the local area. As such the third test would be be passed and therefore the implementation of mitigation measures under a disturbance licence from Natural England under the Conservation of Habitats and Species (Amendment) Regulations 2012 would not be required.

B.7.189 As Pond P6 is located closer to the site, if GCN are present in this pond, the likelihood of GCN being present in the site is greater than for Ponds P1 – P5. However, given the factors stated above, it is unlikely that a significant proportion of any GCN population based at Pond P6 would be present in the woodland and hedgerows in the parts of the site that fall within 500m of Pond P6. The woodland and hedgerows in these parts of the site are being retained, however there will be significant ground disturbance within close proximity to these habitats in addition to a break being introduced into one hedgerow.

B.7.190 It is therefore considered probable that in addition to some limited habitat disturbance, a small number of individual GCNs could potentially be harmed / disturbed, if a population is present in Pond P6. This would represent a minor adverse impact on GCN populations in the local area. The potential loss of a few individual GCNs during site clearance operations is considered unlikely to affect the overall favourable conservation status of GCN populations in the local area, however

in this case, where a small number of GCN could potentially be harmed/disturbed, it is considered likely that a disturbance licence would need to be obtained from Natural England under the Conservation of Habitats and Species (Amendment) Regulations 2012 and appropriate mitigation measures would need to be implemented in order for the third test to be met.

B.7.191 The impacts on other amphibians, such as common frog, common toad and smooth newt, which may be present in Ponds P1 – P6 are the same as those described for GCN.

Badgers

B.7.192 Badgers and their setts are protected from harm and disturbance under the Protection of Badgers Act 1992. All information relating to badgers has been provided within the *confidential* Appendix B7.4 and is not for general public release.

Bats

B.7.193 All bat species and their roosts are fully protected under national and European legislation. Four minor common pipistrelle roosts have been identified within the site. The level of bat activity recorded at the hedgerow H12 suggests that there could potentially be other minor roosts present in hedgerow H12. The main impacts on bats are considered to be:

- Roost Loss;
- Disturbance;
- Fragmentation and isolation; and
- Post-development interference impacts.

Roost Loss

B.7.194 The roosts are located in sections of hedgerows which are to be retained as part of the development and therefore will not be lost or damaged.

Disturbance

B.7.195 There could be potential for a low number of common pipistrelles using the tree roosts to be disturbed by increased human activity, noise and lighting during construction works in the vicinity of the roosts.

B.7.196 Bats foraging in adjacent and retained habitats could be temporarily disturbed if construction works are undertaken between dusk and dawn due to increased noise and light levels. This *probable* adverse impact is considered to be of minor significance to bats at a local level, as this impact is short-term and bats will be able to utilise other suitable foraging habitats and alternative flight lines which are available in the local area.

B.7.197 It is therefore considered *probable* that the construction works could have a short-term minor adverse impact on individual bats at a local level as they may be displaced into alternative foraging areas and roosts.

Fragmentation and isolation

B.7.198 Three of the roosts are located in the boundary hedgerows which are being retained. Common pipistrelles from these roosts should therefore be able to access the surrounding countryside and will not become isolated.

B.7.199 The night/feeding roost located in hedgerow H12 may become isolated due to two breaks being introduced to the north and south of the roost for two roads leading to a proposed roundabout. The impact to this roost may be lessened by the presence of two areas of woodland which have mature tree canopies that bridge over the road and which pipistrelles could use for navigation. One of these areas of woodland is located opposite the roost adjacent to Crouch Cottages and the other is the small parcel of woodland located in the north-west of the site.

B.7.200 Although no bats were seen emerging or re-entering other mature trees in hedgerow H12, high bat activity recorded by the mature trees with bat roost potential suggests that further minor tree roosts could potentially be present in hedgerow H12 and therefore adverse impacts on bats could potentially arise due to the loss of any trees with bat roost potential. Most of these trees will be retained.

B.7.201 The results of the 2011 and 2012 bat surveys showed that at least four bat species were utilising the site for foraging and navigation. Foraging bats could be affected by the removal of sections of hedgerow H13 and H16 and the introduction of breaks in hedgerows H12, H13, H15 and H16. Surveys recorded bats foraging along all these hedgerows. The removal of these hedgerows could potentially decrease the

foraging area available to bats on the site and fragment several flight-lines through the centre of the site.

B.7.202 Bats are likely to continue to forage along the majority of the retained hedgerows which will maintain a degree of connectivity of flight lines around the site. It is considered unlikely that the loss of habitats on site will disrupt connectivity between bat roosts located off-site and the foraging areas which will remain on the boundaries of the site. Additionally common and soprano pipistrelles, which were the dominant species recorded on site, are known to cross open areas and not to be as sensitive to gaps as, for example, Daubenton's bats which may not cross introduced gaps of approximately 7m. Noctules, which were also recorded at the site, are also known to cross and forage over open areas. The loss of hedgerows H13 and H16 and small sections of H12, H13, H15 and H16 is therefore considered *probable* to be an adverse impact of minor significance on individual bats of at least four different species located in the area. This impact is unlikely to be significant at a district, county or national level and not as adverse for common and soprano pipistelles and noctule bats.

Post development interference impacts

B.7.203 Once the development has been completed, bats could be adversely affected as a result of increased lighting and noise within the site, particularly security lighting. This permanent increase in noise and light levels at the site has the potential to disrupt foraging and commuting bats, in particular along the retained hedgerows, although common pipistrelle and noctule bats are known to forage around lighting and street lamps. *Myotis* species may be more sensitive to increased lightning. It is considered probable that this disruption could result in long-term minor adverse impacts on individual bats at a local level as some of these individuals and species may forage elsewhere, although impacts on common and soprano pipstrelles and noctule bats are likely to be less significant.

B.7.204 The cessation of agricultural use in the site could have *probable* beneficial impacts on foraging bats by increasing insect diversity in the area, in particular along the retained hedgerows and ditches.

B.7.205 There may be an increase in cats in the area as the residential areas become occupied which could potentially result in an increased number of bats being predated. It is considered *probable* that this could result in long-term minor adverse impacts on bat populations at a local level.

Birds

B.7.206 If any vegetation clearance is undertaken during bird breeding season (March to August inclusive), there is a risk that breeding birds will be disturbed.

B.7.207 The construction works could also disturb breeding birds which could potentially be nesting within the retained hedgerows. Sudden high levels of human disturbance and noise may cause birds to abandon nests. Therefore, a minor to moderate adverse impact on breeding birds at a local level is *probable* if the construction and any associated vegetation clearance are undertaken during bird breeding season (March to August inclusive).

B.7.208 The loss of sections of two hedgerows and small sections in two other hedgerows due to the development will result in a reduction of nesting opportunities for tree nesting birds within the site. Additionally, the loss of arable land will result in a decrease of foraging habitat for birds and the total removal of potential nesting habitat for ground-nesting birds such as skylark. The *probable* adverse impacts as a result of these losses are considered to be of minor significance to breeding birds in the local area. The retention of the hedgerows will continue to provide suitable foraging habitat for birds.

B.7.209 Ground-nesting birds, such as skylark, and other farmland bird species such as yellowhammer could potentially to be displaced by the development. The impact on these species from the development is therefore considered moderate at a site level as these species would be lost from the site, although this impact would be of minor significance at a local level and not significant at a district, county or national level, as populations of these birds could potentially use other farmland habitats in the local area.

B.7.210 The loss of arable fields and sections of hedgerow as well as the disturbance to foraging birds is considered unlikely to have significant adverse impacts on foraging

birds at a local level, as large areas of similar foraging habitats are present in the local area.

B.7.211 Once the development has been completed, breeding birds could additionally be adversely affected as a result of increased noise level within the site, although birds should be able to readily habituate to new levels of noise and therefore negligible impacts on breeding birds post-construction are considered to be *probable.*

B.7.212 There may be an increase in cats in the area as the residential areas become occupied which could potentially result in an increased number of birds being predated. It is considered *probable* that this could result in long-term minor adverse impacts on bird populations at a local level.

Brown Hare

B.7.213 The proposed development will result in a loss of open arable fields including areas that could potentially provide suitable laying up and foraging habitat for brown hares. Any brown hares present on site are therefore likely to be displaced from the site into the surrounding farmland. This impact is considered *probable* to be minor on brown hares at a local level and not significant at a county or national level.

Dormouse

B.7.214 The habitats on site are considered of negligible value for dormice and therefore the development is considered to have a *certain/near-certain* negligible impact on dormice.

Hedgehog

B.7.215 The hedgerows located on site have the potential to provide suitable resting and foraging habitat for hedgehogs. However it is considered *probable* that the loss of some of the hedgerow habitat due to the development is likely to result in a negligible adverse impact on hedgehogs, as areas of similar habitat are located in the vicinity in addition to other habitats which may be more suitable for hedgehogs e.g. woodland, grassland, parkland and gardens.

B.7.216 During construction works, there is the potential for hedgehogs to enter any excavations which are left open overnight. In this case, it is *probable* that the

proposed development could result in a minor adverse impact on hedgehogs if present.

B.7.217 There may also be an increased risk in road mortality on hedgehogs post-construction due to increased road traffic which could have *probable* long-term impacts of minor significance on hedgehog populations at a local level.

Invertebrates

B.7.218 There will be a loss of arable farmland, however this habitat is unlikely to support a notable assemblage of invertebrates due to use of fertiliser and pesticides and therefore it is considered *certain/near-certain* that there will be negligible impacts on invertebrates from the loss of arable farmland. The majority of hedgerows within the application site will remain, therefore the impact of the removal of sections of hedgerow H13 and H16 and the introduction of breaks in hedgerows H12 and H16 upon invertebrates using them is considered *probable* to be minor adverse at a site level.

B.7.219 If a pollution event occurs in the ditches as a result of the construction works or post-construction then there is the potential to harm freshwater invertebrates. Any pollution event has the potential to have a minor to major adverse impact on freshwater invertebrates depending upon the nature and extent of the pollution event.

B.7.220 The cessation of agricultural production at the site will decrease nutrient inputs into the field ditches thus improving the water quality in these watercourses which could in turn have a probable beneficial impact on freshwater invertebrates.

Reptiles

B.7.221 There is a risk that any clearance and construction activities undertaken in the hedgerow habitats could potentially harm or disturb a low number of common reptiles if present at the time of the works. This could potentially result in an adverse impact of minor significance local reptile populations at the time of the site clearance. The likelihood of this impact is assessed as being unlikely to probable and could be significant at a local level, although it is unlikely to be significant at a county or national level.

B.7.222 The loss of sections of hedgerow H13 and H16 and the introduction of breaks in hedgerows H2, H13 and H16 could reduce the amount suitable habitat available for common reptiles within the site which is already consider to be limited. The loss of hedgerows could also decrease the connectivity of suitable habitats within the site which reptiles may potentially disperse along.

Other fauna

B.7.223 There is the potential for other mammal species to enter any excavations which are left open overnight during the construction works. There may also be an increase in road mortality post-construction due to an increase in roads and traffic in the area therefore it is considered *probable* that the proposed development could result in minor adverse impacts on these species at a local level.

Cumulative Impacts

B.7.224 This section considers the cumulative impacts of developments at the Land South of the Salt Way at Crouch Farm (the Horgan Land) and Longford Park.

B.7.225 The Horgan Land site is located to the north-west and adjacent to the Wykham Park Farm site and is being proposed for 145 dwellings with associated infrastructure. A planning application for this site has been submitted.

B.7.226 Longford Park is located to the east of the Wykham Park Farm site and is being proposed for 1,070 residential units with primary school, playing fields, local shops and community facilities. This development has received outline planning permission.

B.7.227 The cumulative impacts assessment assumes that similar habitats to those lost in the Wykham Park development are also being lost from the Horgan Land and Longford Park developments, namely arable land and small sections of hedgerow. The Environmental Statement (2005)[23] for the Longford Park development (formerly known as College Fields) stated that 100% of arable land, improved and semi-improved grassland and 915m of hedgerow would be lost. Mature trees would be retained.

[23] **Hallam Land Management Ltd & J. J. Gallagher** (2005) College Fields Environmental Statement.

B.7.228 The assessment also assumes that the majority of hedgerows are being retained and that areas of landscaping, surface water attenuation features and public open space will be incorporated into each of the developments. It is also assumed that a similar range of wildlife species will be present in the other proposed development sites to those present within the Wykham Park Farm site. The Environmental Statement (2005) for the Longford Park development made reference to breeding birds, bats and reptiles being present.

Potential cumulative impacts on the County Wildlife Sites

B.7.229 Due to the distances between the proposed development scheme and Bretch Local Wildlife Site, no direct or indirect cumulative effects on this site are anticipated.

Flora and habitats

Arable Fields

B.7.230 The Wykham Park Farm, Horgan Land and Longford Park sites predominantly comprise intensively used agricultural land. The arable land will be lost in the event of the proposed development. Overall arable land is considered to be of negligible value to nature conservation, although it has some value to a few wildlife species.

B.7.231 In the context of the wider area, it is considered *probable* that the loss of the majority of the arable land to these proposed developments will have long-term adverse impacts on ground-nesting birds and brown hares, and therefore the cumulative impact is considered to be minor-moderate on these species at a local level due to the scale of loss.

Hedgerows

B.7.232 As with the Wykham Park Farm site, the majority of hedgerows within the Horgan Land and Longford Park sites appear to be retained within the proposed developments. The loss of some hedgerows which are considered to be of local value of nature conservation could represent minor adverse impacts at a local level, however the retention of the majority of the hedgerows will maintain connectivity around and throughout the development sites. New landscape planting as part of these schemes will also lessen the adverse impact.

B.7.233 The cumulative impact of retaining the majority of hedgerows within the developments will result in a long-term negligible impact, as a network of corridors will be retained across the local area for wildlife and new landscape planting will help compensate for loss of some hedgerows.

Mature trees / semi-mature trees

B.7.234 Mature trees are being retained in the Longford Park proposed development. Several trees could potentially be lost as part of the Horgan Land proposed development along the western boundary. The cumulative adverse impact is assessed as being of minor significance overall as the majority of hedgerows (which many of the mature and semi-mature trees are associated with) will be retained and landscape planting in the development sites will eventually compensate for the loss of these trees, once mature, which will reduce the severity of this impact in the long-term.

Woodland / Mixed Plantation

B.7.235 The development of the Horgan Land could also potentially damage the parcel of broad-leaved woodland in the north-west of the Wykham Park Farm site therefore contributing to *probable* adverse impacts on this woodland. The severity of the cumulative impact on this woodland would still be considered to be minor.

Watercourses

B.7.236 A cumulative effect on watercourses could arise from these combined developments as the receiving sewerage network and its capacity could be reduced. Potentially this can cause foul flooding, exacerbate existing flooding problems and impact on the water quality of local watercourses from combined sewer overflows and final effluent from sewage treatment works. In terms of the worse case scenario there is potential for a moderate adverse cumulative impact on the watercourses from the developments (see Section B3).

Fauna

Amphibians

B.7.237 Due to the distance between the Longford Park and Wykham Park Farm sites, no cumulative impacts on amphibians which may use the limited habitat available in the Wykham Park Farm site are anticipated.

B.7.238 The retention of the majority of the hedgerows within the Horgan Land site, as well as the Wykham Park Farm site, in addition to areas of public open space, surface water attenuation features and gardens, would provide terrestrial habitat for amphibians to disperse and forage along and it is considered *probable* that amphibian populations will be able to be maintained within these developments, although a small number of individuals, including GCN if present, may be harmed during construction works resulting in a minor adverse impact at a local level.

Badgers

B.7.239 The cumulative impacts of on badgers are detailed in the *confidential* Appendix B7.4.

Bats

B.7.240 Common pipistrelles can forage up to 3-4km from their roosts and therefore there is potential for cumulative impacts to arise on common pipistrelles using the roosts located at the Wykham Park Farm site from hedgerow loss and fragmentation of the hedgerow network as part of the development of the Horgan Land and Longford Park land. Common pipistrelles were also recorded foraging along the Oxford Canal as reported in the Environmental Statement (2005) for the Longford Park development.

B.7.241 The majority of hedgerows are being retained in the proposed developments however, providing flight-lines, connectivity and foraging areas for bats. The attenuation areas, public open space and landscape planting may also be used by foraging bats and will compensate for the sections of hedgerows lost to development.

B.7.242 There will be increased public pressure following the development with an increase in the levels of noise and light which could result in the value of the hedgerow network for foraging bats decreasing, although common and soprano pipistrelles and

noctules which have been recorded at the Wykham Park Farm site are known to forage around lighting.

B.7.243 There is also the increased risk from predation by cats once the residential developments are complete. Depending on the density of cats present in the final developments, cumulative impacts on bats could potentially be minor to moderate adverse at a local level.

B.7.244 It is therefore considered *probable* that there will be a minor to moderate cumulative adverse impact on bats in the local area.

Birds

B.7.245 In addition to retaining the majority of the hedgerows within the Wykham Park Farm site, the majority of hedgerows will be retained in the Horgan Land and Longford Park developments with the loss of some hedgerows being compensated for by landscape planting. Attenuation areas in these developments may also attract a range of water-bird species which are not currently present and some bird species will be able to use residential gardens.

B.7.246 However, the cumulative loss of arable habitats will reduce the value of the area for some bird species, particularly ground nesting birds including skylark, which are likely to be displaced from these areas.

B.7.247 The increase in residential areas in all three developments could increase the risk of predation of birds by cats. Depending on the density of cats present in the final developments, cumulative impacts on birds could potentially be minor to moderate adverse at a local level.

B.7.248 It is therefore considered *probable* that the developments will result in a minor to moderate cumulative adverse impact on birds overall at a local level.

Brown hares

B.7.249 Further loss of arable habitat in the Horgan Land and Longford Park sites will reduce the value of the area for brown hares. This species is likely to be displaced by the developments probably to adjacent farmland to the south. It is therefore considered

probable that cumulative impacts on brown hares will be moderate adverse at a local level as this species is likely to be lost from the development areas although they will still be able to survive in the locality.

Hedgehog

B.7.250 The further loss of hedgerow habitats to the three developments will decrease the existing foraging area for hedgehogs in the local area. However, areas of similar habitat and areas which provides more suitable habitat for hedgehog are located in the surrounding area and this species will be able to utilise gardens, where accessible, and public open space once the developments are completed.

B.7.251 There could potentially be an increased risk of road mortality from increased traffic and roads in the area. It is therefore considered *probable* that the developments will have minor adverse cumulative impacts on the local hedgehog population mainly arising from the increased risk of road mortality.

Invertebrates

B.7.252 The majority of habitats, i.e. arable farmland, across the development sites are considered to have negligible value for invertebrates. However, the further loss of some hedgerows to the developments will decrease the amount of suitable habitat available for invertebrates. However, the proposed attenuation areas, landscape planting and public open space, as well as residential gardens, in the completed developments could provide suitable habitat for a diverse range of invertebrates and therefore it is considered *probable* that there will be negligible cumulative impacts on invertebrates overall.

B.7.253 If one or more pollution event were to occur in the watercourses during the construction works or post-construction across three developments, although unlikely, there could be adverse impacts on freshwater invertebrates due to a decrease in water quality. The severity of the cumulative impact would depend upon the nature, scale and timing of any pollution events. However, it is *probable* that there will be a beneficial cumulative impact on freshwater invertebrates as a result of the water quality in the local watercourses improving following the cessation of agricultural production as a result of the developments.

Reptiles

B.7.254 Due to the distance between the Longford Park and Wykham Park Farm sites, no cumulative impacts on reptiles which may be present in the Wykham Park Farm site are anticipated.

B.7.255 The habitats present within the Horgan Land and Wykham Park Farm sites are broadly similar and are considered to have limited potential for a small number of common reptiles. There is a risk of harm to a low number of individual reptiles which may be present during construction works and therefore it is considered *unlikely to probable* that the developments of both these sites will result in minor cumulative impacts on reptiles at a local level.

Other Fauna

B.7.256 No cumulative impacts are anticipated on dormouse, otter or water vole.

B.7.257 Cumulatively there will be impacts of at least minor significance on other fauna mainly arising from the risk of harm and disturbance during the construction works and increased risk of road mortality following the completion of the developments.

Summary of Potential Impacts

B.7.258 Table B7.9 below provides a summary of potential impacts of the development on the application areas and of the identified cumulative impacts.

Table B7.9 – Summary of Potential Impacts

Area	Major Impact Type	Value of Receptor	Predicted Impact	Mitigation
Statutory and non-statutory sites				
Bretch Local Wildlife Site	No impacts	County	None	Mitigation not required
Planning Application Area				
Habitats				
Arable land	Direct loss	Negligible	Negligible but minor impacts on some fauna species.	Not mitigatable
Hedgerows	Loss/damage but majority retained	Local	Minor	Mitigatable

Area	Major Impact Type	Value of Receptor	Predicted Impact	Mitigation
Mature/Semi mature trees	Damage / loss of trees	At least local	Minor	Mitigatable
Woodland/ Mixed Plantation	Damage	Local	Minor	Mitigatable
Ditches	Indirect effects on water quality/ Temporary disturbance	Negligible	Minor-Major if pollution event Beneficial – improved water quality	Mitigatable
Fauna				
Amphibians	Loss of limited habitat Harm/disturbance	N/hood	Minor	Mitigatable
Badgers	Included in confidential appendix B7.4			
Bats	Loss of roost Loss of foraging habitat and connectivity Disturbance	At least local	Minor	Partly Mitigatable
Birds	Direct loss of breeding sites Harm/disturbance Direct loss of feeding habitat	Local	Minor	Partly Mitigatable
Brown hare	Direct loss of laying up and foraging habitats Harm/disturbance	N/hood	Minor	Not mitigatable
Dormouse	No impacts	Negligible	Negligible	Mitigation not required
Hedgehog	Direct loss of suitable habitat Harm/disturbance	N/hood	Minor	Partly mitigatable
Invertebrates	Loss of limited habitat / harm as result of pollution event Improved water quality	N/hood	Minor - Major Beneficial	Mitigatable
Reptiles	Loss of limited habitat Harm/disturbance	N/hood	Minor	Mitigatable
Other fauna	Loss of habitat Harm/disturbance	N/hood	Minor	Partly mitigatable

Area	Major Impact Type	Value of Receptor	Predicted Impact	Mitigation
Cumulative Impacts				
Statutory and non-statutory sites				
Bretch Local Wildlife Site	No impact	County	None	Mitigation not required
Cumulative Impacts				
Habitats				
Arable	Direct loss	Negligible	Negligible but minor – moderate on some fauna species	Not mitigatable
Hedgerows	Loss/damage but majority retained	Local	Minor	Mitigatable
Mature / semi-mature trees	Direct loss / damage but majority retained	Local	Minor	Mitigatable
Woodland	Direct loss / damage to areas retained	Local	Minor	Mitigatable
Watercourses	Indirect effects	Local	Moderate	Mitigatable
Fauna				
Amphibians	Loss of foraging habitat for amphibian populations Harm/ disturbance	N/hood	Minor	Partly Mitigatable
Badgers	Included in confidential Appendix B7.4			
Bats	Loss of foraging and flight-lines Harm post-construction	Local Local	Minor Minor - Moderate	Mitigatable Not mitigatable
Birds	Direct loss of breeding sites / Harm and disturbance Direct loss of feeding habitat Harm post-construction	Local	Minor - Moderate Minor Minor-Moderate	Partly mitigatable Mitigatable Not mitigatable
Brown hares	Direct loss of laying up and foraging habitats	N/hood	Moderate	Not mitigatable

Area	Major Impact Type	Value of Receptor	Predicted Impact	Mitigation
Dormouse	No cumulative impacts	Negligible	Negligible	Mitigation not required
Invertebrates Freshwater Invertebrates	Direct loss of habitat Harm if pollution event Improvement of water quality	N/hood	Negligible Minor – major Beneficial	Partly mitigatable
Reptiles	Direct loss of limited habitat Harm/ disturbance	N/hood	Minor	Mitigatable
Otter	No cumulative impacts	Negligible	Negligible	Mitigation not required
Water vole	No cumulative impacts	Negligible	Negligible	Mitigatable
Other fauna	Harm/ disturbance	Minor	Minor	Partly mitigatable

Mitigation Measures

B.7.259 Mitigation measures can be based on:

- Avoidance of impacts through re-location, re-design or changes in construction programme;
- Reduction of impacts - involving lessening the severity of an impact which cannot be avoided;
- Compensation for impacts through habitat creation or enhancement.

B.7.260 Throughout the process of development of the masterplan for the site, consideration has been given to avoidance of significant ecological impacts where possible, reducing the severity of other potential impacts and consideration of opportunities for compensation through habitat creation or enhancement of retained habitats. This section therefore outlines the mitigation measures proposed for the site. The mitigation measures are considered appropriately to address the main potential impacts identified above and are practicable and reasonable and will not affect the integrity of the proposed development.

B.7.261 One of the key principles in guiding the formulation of mitigation measures has been to retain continuity and functioning of the retained linear habitats, i.e. the hedgerows and trees. The masterplan provides for preservation of the majority of

hedgerows which will be retained. This network of hedgerows linked to areas of open space will retain opportunities for wildlife to move around and beyond the application site.

National and Local Policy Considerations

National Planning Policy Framework (NPPF)

B.7.262 The National Planning Policy Framework (NPPF) is a material consideration for the purposes of planning decision making and supersedes all existing PPSs and PPGs.

B.7.263 The NPPF places a presumption in favour of sustainable development.

Local Plan

B.7.264 Saved Policy C1 of the Cherwell Local Plan provides protection from development all designated sites of importance for nature conservation including statutory and non-statutory sites.

B.7.265 *"The Council will seek to promote the interests of nature conservation. Development which would result in damage to or loss of sites of special scientific interest or other areas of designated wildlife or scientific importance will not normally be permitted. Furthermore, the council will seek to ensure the protection of sites of local nature conservation value. The potential adverse affect of development on such sites will be a material consideration in determining planning applications."*

B.7.266 Due to the distances between the proposed development and the nearest site of nature conservation value (Bretch Local Wildlife Site), no direct or indirect impacts are anticipated and therefore no specific mitigation measures are required.

B.7.267 Saved Policy C2 of the Local Plan provides protection from development on wildlife species already protected by legislation.

B.7.268 *"Development which would adversely affect any species protected by Schedule 1, Schedule 5 and Schedule 8 of the 1981 Wildlife and Countryside Act, and by the E.C. Habitats Directive 1992 will not normally be permitted."*

B.7.269 A small number of protected species occur on and adjacent to the site. Therefore, appropriate mitigation measures will be incorporated into the development to meet the requirements of the law relating to these species and these measures are outlined below.

B.7.270 Saved Policy C4 deals with the creation of new habitats as part of any developments.

B.7.271 *"The Council will seek to promote the creation of new habitats. In urban areas the council will promote the interests of nature conservation within the context of new development and will establish or assist with the establishment of ecological and nature conservation areas, where such areas would further the opportunity for environmental education and passive recreation and would not conflict with other policies in the plan."*

B.7.272 New habitats will be created as part of the development at Wykham Park Farm. These will include wetland features as part of the SuDS and surface water attenuation for the site, landscape planting, hedgerows and informal and formal open space. There are opportunities to enhance these habitats for biodiversity through native planting, provision of aquatic habitat, provision of nest-boxes and bat boxes and the implementation of an Ecology and Landscape Management Plan which will manage suitable habitats for the benefit of wildlife within the development.

B.7.273 Saved Policy C5 is also relevant to the development and gives protection to the Saltway which is adjacent to the northern boundary of the site.

B.7.274 *"The Council will seek to protect the ecological value and rural character of the following through the control of development:*

(i) The Oxford Canal and River Cherwell;

(ii) The flood plain of the River Cherwell;

(iii) Saltway, Banbury;

(iv) The mineral-railway footpath route and geological site of special scientific interest, Banbury;

(v) The urban woodlands to the south of St.Louis meadow, at Grimsbury Green and to the north of Grimsbury Reservoir, Banbury;

(vi) Otmoor and the flood plain of the River Ray."

Statutory and Non-statutory Sites

B.7.275 Due to the distances between the proposed development scheme and the nearest site of nature conservation value (Bretch Local Wildlife Site), no direct or indirect impacts are anticipated and therefore no specific mitigation measures are required.

Habitats

Arable land

B.7.276 It is not possible to mitigate for the loss of arable land within the site.

Hedgerows and trees

B.7.277 The primary ecological objectives of the retention of the majority of the hedgerows within the site are to:

- Provide habitat for wildlife, particularly birds and bats;
- Provide opportunities for movement of wildlife around and beyond the site.

B.7.278 In order to retain, as far as is possible, continuity of retained habitats within the proposed development, 88% of the hedgerows within the site will be retained.

B.7.279 Within the built development, the retained hedgerows will be associated with roads or will be adjacent to areas of open space. They will not form rear or side boundaries of development where appropriate maintenance cannot be provided. Appropriate management of retained hedgerows will be instigated so as to maximise their value to birds and other wildlife.

B.7.280 Pedestrian and cycle access points with the Saltway will be aligned with existing gaps in the hedgerow.

B.7.281 Where a retained hedgerow is in poor condition, and/or with poor species diversity, enhancement work will be undertaken, including:

- Gapping up the hedgerow with suitable local species;
- Management to establish at least 1 hedgerow tree for every 50m length of hedgerow;
- Introduction of a management regime to facilitate use of the hedgerow by wildlife; and
- Hedgerow flora planting with an appropriate seed mix e.g. Emorsgate Seed

Mix EH1).

B.7.282 The development also makes provision for the retention of the majority of the mature/semi-mature hedgerow trees.

B.7.283 In order to prevent damage to existing and retained hedgerows and trees, excavations near hedgerows and trees will be undertaken in accordance with BS5837:2012 – Trees in relation to construction.

B.7.284 298m of hedgerow and new landscape buffers and street planting will be created within the development which will compensate for the loss of 498m of hedgerows to the development. The new hedgerows will comprise native species of local provenance which will include a mixture of hawthorn, blackthorn, elder, field maple, dog-rose, field rose and hazel. Species of standard trees to be planted will include pedunculate oak, sweet chestnut and Scots pine.

B.7.285 The street sections drawing JJG043/022/A (in the DAS) indicate that new landscape buffers will be created adjacent to the Saltway and at Bloxham Road. The landscape buffer adjacent to the Saltway will be approximately 10m wide and include tree and shrub planting. The landscape buffer adjacent to Bloxham Road and the new roundabout will be approximately 5m wide and include shrub and tree planting. In addition an approximately 3m wide strip of shrub and tree planting will be provided adjacent to the new swale located along the southern boundary of the site. Street tree planting will also be undertaken. A programme of advanced planting will be instigated for these areas to provide mixed aged planting, which is of greater benefit to wildlife. The areas of structure landscape planting will provide additional tree and hedgerow habitats and connectivity within the site which could benefit local wildlife such as bats and birds.

B.7.286 Appropriate management of the existing and new hedgerows and areas of structure landscape planting will be implemented to enhance their value for biodiversity. Details of this management will be included in an Ecology and Landscape Management Plan for the site.

Woodland and scrub

B.7.287 Tree planting as part of the structure landscaping within the site as described in the above section, once mature, will compensate for the loss of the stand of Douglas Fir. Species planted will include a mixture of native species such as hawthorn, blackthorn, elder, field maple, dog-rose, field rose, hazel, pedunculate oak, sweet chestnut and Scot's pine, rowan, dogwood, guelder rose, silver birch, wild cherry and crab apple.

B.7.288 In order to protect the areas of semi-natural woodland and mixed plantation, excavations near trees will be undertaken in accordance with BS5837:2012 – Trees in relation to construction.

B.7.289 The semi-natural broad-leaved woodland in the north-west of the site will be enhanced for biodiversity. A glade will be created within the woodland with selective thinning of trees undertaken as appropriate. Woodland flora planting will also be undertaken using an appropriate seed-mix e.g. Emorsgate Seed Mix EW1.

Watercourses/waterbodies

B.7.290 Due to the close proximity of the development to the drainage ditches which are being retained, it the Environment Agency's Pollution Prevention Guidelines (PPGs) are followed, in particular PPG 1 and 5, to prevent any pollution event affecting these and adjacent habitats.

B.7.291 Further measures to be undertaken to prevent pollutants and sediments entering the ditches and watercourses downstream are described in Section B3: Water Environment. These measures will be included in a Construction Environmental Management Plan for the site.

B.7.292 The incorporation of SuDS techniques as part of the design process which will include the use of swales, retention basins and one to three smaller ponds which will ensure that impacts during operation on water quality from the development are reduced to an acceptable level, assuming these are maintained appropriately (see Section B3). The street sections drawing (JJG043/022) indicates that the swale would be approximately 1m wide with shallow banks (3m wide) with an approximately 3m wide strip of tree and shrub planting along its northern edge. Marginal and aquatic

planting will be undertaken in the wetland areas to enhance their value for biodiversity, in particular in the smaller ponds. An appropriate seed mix, e.g. Emorsgate Seed Mix EM1 – Pond Edge Mixture), will be planted around the ponds and a range of aquatic species which are of value for amphibians as egg-laying plants including water forget-me-not (*Myosotis scorpoides*), water mint (*Mentha aquatica*), reed canary grass (*Phalaris arundiacea*), brooklime (*Veronica beccabunga*) and water plantain (*Alismo plantago-aquatica*) tufted forget-me-not (*Myosotis laxis*), water-cress (*Rarippa nasturtium-aquaticum*), branched bur-reed (*Sparganium erectum*), floating sweet-grass (*Glyceria fluitans*), fool's-water-cress (*Apium nodiflorum*), blue water-speedwell (*Veronica anagallis-aquatica*) and broad leaved pondweed (*Potamogeton natans*) will be planted in the margins of the ponds.

B.7.293 The incorporation of the existing minor watercourse/ditch and the application of the SuDS treatment train within the development means that there will be a net increase in open water across the site. The SuDS will create a range of aquatic habitats within the site which could give rise to beneficial impacts on wildlife in the local area including bats, birds, invertebrates, amphibians and reptiles.

Grasslands

B.7.294 The development will include areas of formal open space, informal open space, greenways and allotments. Tree and scrub planting will be undertaken in these areas.

B.7.295 Areas of grassland will be created as part of public open space. The value of the proposed grasslands will be enhanced by to allowing some areas of grassland to grow taller, particularly those around the proposed balancing ponds and hedgerows. Taller areas of grassland will provide cover for small mammals and be more attractive to terrestrial invertebrates.

B.7.296 Wildflower meadow planting will be undertaken in the more informal areas of public open space. These areas will be sown with an appropriate wildflower mix, such as Emorsgate Seed Mix EM1.

B.7.297 Bulb planting will also be undertaken in these areas in order to provide early nectar sources for invertebrates. Species included will be daffodil (*Narcissus sp*.), *crocus sp*,

snowdrop (*Galunthus nivalis*), bluebell (*Hyacinthoides non-scripta*) and pignut (*Conopodium majus*).

B.7.298 Management specifications for open habitats will be detailed in order to maximise their nature conservation value. Management will be detailed in an Ecology and Landscape Management Plan for the site and include prescriptions as follows:

- Appropriate mowing regime, possibly once in early March and once in late September, with cuttings removed to retained stressed conditions and reduce the competitiveness of grasses;
- Lack of fertiliser input to retain a low nutrient status, which will discourage competitive species;
- Monitoring of the condition of the grassland on an annual basis and continued reassessment of management requirements.

Fauna

Amphibians

B.7.299 Given the conclusions reached in the impact assessment for Ponds P1 – P5, no mitigation for GCN, which may be present in these ponds, is likely to be required as part of the proposed development.

B.7.300 If great crested newts are found to be present in Pond P6 and there is significant ground disturbance within the part of the site close to Pond P6, then it may be necessary to apply for a disturbance licence from Natural England to carry out mitigation measures for this European Protected Species under the Conservation of Habitats and Species (Amendment) Regulations 2012.

B.7.301 Mitigation measures in this case would include the capture and exclusion of great crested newts from areas of suitable habitat within the site, where these are located within and/or up to 500m of Pond P6. The exclusion and capture of GCN from the parts of the site affected would involve the use of exclusion fencing and pitfall traps and would be undertaken in accordance with the relevant Natural England guidance. An area within the proposed development site would be designated as a receptor site for captured amphibians and habitat creation and enhancement measures would be implemented such as the creation of hibernacula and new aquatic habitat, also following Natural England guidance.

B.7.302 The new retention basin, swale and smaller ponds located within the attenuation areas in the site will increase the aquatic habitat present in the site and the local area which could potentially support amphibians. Marginal and aquatic planting will be undertaken as described in the watercourses/waterbodies section above. The smaller ponds will be designed to be of value to wildlife including amphibians and will be included as part of a receptor site should GCN be found to be present. Two hibernacula are also to be provided as an enhancement measure for reptiles (see later section on reptiles) which GCN or other amphibians will be able to exploit.

B.7.303 Provision has been made to retain as many hedgerows as possible within the site and new areas of public open space and structure landscaping will retain potential terrestrial habitat for amphibians within the application areas. Management of these areas will maintain their value for amphibians within the development.

B.7.304 Mitigation measures for GCN as outlined above and as described in the GCN mitigation strategy (Appendix B7.7), including habitat creation and enhancement measures, will ensure that the proposed development does not result in significant impacts on the favourable conservation status of this species, in accordance with Regulation 53 (9)(b) of the Conservation of Habitats and Species (Amendment) Regulations 2012.

Badgers

B.7.305 Mitigation measures for badgers are detailed in a *confidential* Appendix B7.4.

Bats

B.7.306 Prior to any felling or tree surgery as part of the development, trees will be re-assessed for their current bat roost potential and, if individual trees are assessed as having high bat roost potential, these trees will be subject to either a detailed inspection by a licensed bat-worker or emergence/re-entry surveys to determine whether a roost is present. Should bats or evidence of bat occupation be found within the trees then it will be necessary to apply for a disturbance licence from Natural England to carry out mitigation and compensation measures (e.g. erection of new bat boxes and relocation of any bats found) for these European Protected Species under the Conservation of Habitats and Species (Amendment) Regulations 2012.

B.7.307 Bat-boxes will be erected in the semi-natural broad-leaved woodland in the north-west of the site and on suitable mature trees in the retained hedgerows. This will enhance the retained habitats within the site for bats by providing more roosting opportunities. It is proposed that four Schwegler 2F bat boxes, which are suitable for smaller bats like pipistrelles, and four Schwegler 2FN bat boxes, which attract some of the larger bats including noctule, will be erected in the north-west woodland and that four Schwegler 2F bat boxes and four Schwegler 2FN bat boxes will be erected on suitable trees in the retained hedgerows.

B.7.308 There are also opportunities to create roosting areas within buildings without compromising the commercial viability of the properties. Features such as ridge boxes set within roof voids can provide opportunities for bats without adversely affecting people (or contravening the Buildings Regulations). The provision and locations of these bat boxes will need to be considered at the detailed planning stages and could be a way in which house builders could achieve ecology credits under the Code of Sustainable Homes assessment.

B.7.309 Bat foraging corridors within the site, in particular along the Saltway and along the mixed plantation woodland will be retained and managed primarily for nature conservation.

B.7.310 Where hedgerows are bisected with roads, trees will be allowed to grow to maturity on either side of the road to minimise the gap in canopy cover. New hedgerows and structure landscaping within the site could potentially provide additional foraging and flight-lines for bats.

B.7.311 The new hedgerows will compensate for the loss of hedgerows. Bats will also have foraging opportunities over new residential gardens and the new aquatic habitats (drainage basin and swale) within the site. The landscape buffer planting adjacent to Bloxham Road and the new roundabout will provide flight lines for pipistrelle bats and connectivity to the retained mature trees, one of which contains a pipistrelle night/feeding roost.

B.7.312 Management of the semi-natural broad-leaved woodland and mixed plantation areas located within the site may also bring about enhancements that will benefit

the local bat populations. The management will be detailed in an Ecology and Landscape Plan for the site.

B.7.313 Street and security lighting will be positioned so that light is directed away from bat flight-lines across the site. The lighting specification will be selected to have the least impact on bats. This includes lights with a low UV component, low wattage, lights with cowlings (or directional beams) or lights which are timed to include periods of darkness. The lighting scheme will also aim to maintain dark movement corridors along the periphery of the site to minimise impacts on bat species which are more sensitive to lighting.

Brown hare

B.7.314 Wooden planks will be placed in any excavations to be left open overnight to provide a means of escape for any brown hares and other mammals which may enter the excavations.

B.7.315 No specific mitigation measures are proposed for brown hare because it is likely that any brown hares using the site will be displaced from the site due to the increase in human disturbance and loss of large areas of open farmland.

Birds

B.7.316 Wild birds use features such as trees, hedgerow, scrub and grasslands for nesting, therefore the timing of their removal will take into account breeding birds. Where it is possible, clearance of vegetation will be removed outside of the breeding season, i.e. between 1st September and 29th February. Pre-clearance checks for birds by an ecologist will be undertaken if it is necessary to clear vegetation outside of this time period.

B.7.317 Retention of the majority of the hedgerows and the mature/semi-mature trees will ensure that many species which are likely to be currently found on site are able to remain. Structure landscaping planting and creation of new hedgerows within the site will also provide nesting habitat which will compensate for the loss of approximately 498m of hedgerows and the stand of Douglas Fir.

B.7.318 The site will be enhanced for birds by erecting a range of nest boxes on existing trees within the retained woodland in the north-west and hedgerows. It is proposed that nine nest-boxes, including three nest-boxes with 26mm holes, three nest-boxes with 32mm holes and three open front nest-boxes will be erected in the woodland in the north-west of the site. A total of eighteen nest-boxes, including six nest-boxes with 26mm holes, six nest-boxes with 32mm holes and six open front nest-boxes will be erected on suitable trees and shrubs in the retained hedgerows.

B.7.319 In future there may be opportunities to erect nest-boxes on the buildings, in particular provision on buildings can be made for swifts and swallows which are local BAP species. These could be in the form of swift bricks incorporated into buildings and provision of recessed eaves. The provision and locations of nest-boxes will need to be considered at the detailed planning stages and could be a way in which Housebuilders could achieve ecology credits under the Code of Sustainable Homes assessment.

Invertebrates

B.7.320 Retention and management of the hedgerows and creation of new habitats such as hedgerows, grasslands, tree/shrub and wetland features will maintain habitat opportunities for a range of terrestrial invertebrates. Surface water attenuation features such as balancing ponds will increase the value of the site for aquatic invertebrates.

B.7.321 The drainage system at the site will incorporate SuDS to ensure that impacts on water quality post-construction are minimised to an acceptable level.

Reptiles

B.7.322 It is considered unlikely to be minor adverse impacts on individual common reptiles from the development, however as a precaution a method statement will be prepared which will detail measures that can be undertaken during the construction works which will minimise and prevent harm to any common reptile i.e. grass snake that might be present at the time of the construction works. The method statement for the site can be covered under an appropriate planning condition and is provided in Appendix B7.8.

B.7.323 As a habitat enhancement measure, two hibernacula for reptiles will be constructed. One will be located near where the grass snake was observed in an existing hedgerow along the northern boundary of the site and will be located near the surface water attenuation features.

B.7.324 The Ecology and Landscape Management Plan will include for placing some grass cuttings from the mowing of amenity grassland in areas of structure landscaping/retained hedgerows to provide potential egg-laying sites for grass snake which have been recorded in the north-east of the site.

B.7.325 The surface water attenuation features may be used by amphibians in future which will increase the prey available within the site for grass snake. The proposed allotments could also be of value for common reptiles.

Other fauna

B.7.326 Wooden planks will be placed in excavations to be left open overnight to provide a means of escape for any brown hares and other mammals which may enter the excavations.

Residual Impacts

B.7.327 Residual impacts are those that will remain after the mitigation measures are implemented.

B.7.328 In terms of ecology and wildlife, the key residual impacts are:

- Potential reduction of bat species through public disturbance and harm from cats in residential areas, but also potential gains because of habitat creation and enhancement of areas which can be used by foraging and roosting bats;
- Potential loss of some breeding bird species associated with open land, but gains of small garden and wetland bird species;
- Potential increase in amphibian and reptile populations on site due to provision of surface water attenuation features, public open space, allotments and landscape planting;
- Reduction in the populations of brown hare, if present;
- Risk of road mortality for hedgehogs and other wildlife which may enter the roads;

- Maturing of structural landscape planting, new hedgerows and marginal planting around surface water attenuation features; and
- Improvement of water quality in retained ditch/watercourse.

B.7.329 A small number of bird species associated with arable land will most likely be lost from the site, although a range of birds will be able to exploit the landscape planting and wetland bird species which are not currently present on site could potentially use any balancing ponds which are created within the development.

B.7.330 Due to the extent of loss of arable habitat, it is likely that brown hares will be displaced from the site, if present.

B.7.331 It is likely that the risk of road mortality for hedgehogs and other wildlife which may enter the roads in the site will remain which could result in minor adverse residual impact at a local level. An increased risk of predation of birds and bats by cats will also remain which could result in minor adverse residual impacts on bat and bird populations.

B.7.332 In the long-term, the maturing of the new structural, hedgerow and marginal planting will provide habitat for wildlife, in particular breeding birds and foraging bats.

B.7.333 The cessation of agricultural production in the site and the incorporation of SuDS into the development are likely to improve the water quality of the retained ditch/watercourse thus improving these habitats for wildlife resulting in at least minor beneficial residual impact. Insect diversity is also likely to increase at the site which will in turn benefit other species such as bats and birds.

B.7.334 The enhancements of the existing retained habitats and created habitats will be implemented and appropriate management of wildlife habitats will be maintained throughout the site. It is therefore considered *probable* that there could be an overall minor beneficial residual impact on local species such as amphibians, birds, bats, invertebrates and common reptiles.

B.7.335 There is potential for further biodiversity enhancements to be undertaken in future at the detailed planning stages by individual house builders, for example, to go towards achieving ecology credits as part of a Code for Sustainable Homes Assessment. These enhancements would be beneficial to local wildlife and biodiversity.

Summary

B.7.336 This section comprises an ecological impact assessment of the proposed development at Wykham Park Farm and the cumulative effects with regard to future proposed development at the Horgan Land and Longford Park sites are also considered.

B.7.337 Baseline information has been gathered from consultations with statutory and non-statutory nature conservation bodies and from flora and fauna surveys of the site.

B.7.338 There are no international or national or other statutory designations on or adjacent to the site. The nearest site of nature conservation is the non-statutory site; Bretch Local Wildlife Site, which is situated approximately 1.2 km to the north-west of the site. Therefore no direct or indirect impacts are anticipated on this non-statutory designation as a result of the proposed development.

B.7.339 The majority of the site comprised arable land. The most notable ecological features are the network of hedgerows and associated ditches, woodland and mature/semi-mature trees.

B.7.340 The majority of the hedgerows will be retained within the proposed development, maintaining a network of wildlife corridors and continuity with open space and other retained habitats. Hedgerows and woodland which are retained will be managed to improve their nature conservation value and the areas of public open space will be enhanced through use of native tree and shrub planting and wild flower seed mixes. Aquatic habitat will result through the creation of small ponds and other surface water attenuation features and SuDS.

B.7.341 There will be direct loss of a stand of Douglas Fir however there will be new structure landscaping within the development which will compensate for this loss.

B.7.342 Retained habitats will be appropriately protected during construction works. The drainage schemes proposed will help prevent degradation in the water quality of the ditches. The cessation of agricultural production in the area is likely to improve the water quality in these watercourses.

B.7.343 Breeding birds and foraging bats use the site, in addition to other fauna such as badger and brown hare with limited habitat for amphibians, invertebrates and common reptiles. Measures are included to mitigate for the potential adverse impacts on these groups and to provide new habitat within the site which will be beneficial to these species.

B.7.344 Residual impacts which will remain after mitigation will include an increased risk of predation on bats and birds by cats, increased risk of road mortality for wildlife entering roads, reduction in some bird species and brown hare populations within the site and beneficial impacts on bats, birds, invertebrates, amphibians, common reptiles and other wildlife species as a result of habitat creation and enhancement measures and improvement of water quality in the watercourses.

B.8 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

Introduction

B.8.1 Wardell Armstrong was commissioned in Summer 2012 by Gallagher Estates Ltd to undertake a landscape and visual impact assessment (LVIA) of the proposed development. The application is for a southward urban extension of Banbury, Oxfordshire, of a residentially led mixed development, on an approximate 50 hectare site known as Wykham Park Farm (WPF).

B.8.2 This report identifies and assesses the significance of the likely landscape and visual impacts of the proposed development on the site and surrounding area. It is based on, and should be read in association with drawings B8.1 – B8.20. An indicative site layout is shown on the Parameters Plan drawing number JJG043/27/B.

B.8.3 Landscape effects associated with a development relate to changes to the fabric, character and quality of the landscape resource and how it is experienced. The landscape assessment includes:

- direct effects upon specific landscape elements, especially prominent and eye catching features;
- change in character, which is the distinct, recognisable and consistent pattern of elements that creates distinctiveness and a sense of place;
- subtle effects that contribute towards the experience of intangible characteristics such as tranquillity, wildness and cultural associations; and
- effects on designated landscapes, conservation sites, and other acknowledged special areas of interest.

B.8.4 Visual effects relate closely to landscape effects, but they concern changes in views. Visual assessment concerns people's perception and response to changes in visual amenity. Effects may result from new landscape elements that cause visual intrusion or new features that obstruct views across the landscape. Both landscape and visual effects can be positive, negative or neutral. Neutral views are where beneficial and adverse impacts cancel each other out, or the changes are neither beneficial nor adverse.

Methodology

B.8.5 The methodology for this assessment follows the recommendations and guidance set out in the Guidelines of Landscape and Visual Impact Assessment (GLVIA), Second Edition, edited by The Landscape Institute and Institute of Environmental Management and Assessment (2002).

B.8.6 Formal consultation was not undertaken specific to the landscape and visual assessment.

B.8.7 The landscape and visual assessment was carried out by an initial desk based assessment and identification of likely receptors, followed by a site survey and analysis to verify viewpoints.

B.8.8 The initial desk-based analysis determined the proposal's broad bare ground zone of theoretical visibility. Once this was established, a number of representative viewpoints showing the site and its surrounding landscape context were taken from potential visual receptors in this area. Not every viewpoint has or can be captured, and those included represent the clearest views of the site available in the area. They are comprehensive but not exhaustive and are representative of the range of views available. Other views of the site may be available from private property, but have not been considered in this assessment. Viewpoint locations are shown on drawing number B8.1 and reproduced in drawings B8.3 to B8.20.

B.8.9 The methodology used to reproduce the viewpoints follows recommendations and guidance set out in Landscape Institute Advice Note 01/11. Photographs were taken to represent peoples' natural view, which is the equivalent of taking photographs with a 50 mm (approximate) lens, and at a height of approximately 1.5m, broadly average eye level. Photographs were taken in September 2012 using a digital camera with an equivalent of a 50mm lens, mounted on a stable, levelled tripod with a professional panoramic head attached. This positions the focal centre of the camera lens above the pivot of the tripod and allows the photographs to be stitched together accurately using software.

B.8.10 The visual assessment considers the site and its surroundings, focusing on a radius of approximately 3.5km. It is considered that observers beyond this distance are

generally unable to perceive detail particularly in a wide panorama, although, the effect of certain changes, particularly changes to skylines, at greater distances may still be perceptible. The site appearing in any views available outside that distance would form a very small percentage of the overall panorama, and potential changes to any available views would be imperceptible. Impacts are likely to be imperceptible in panoramic views where the site is visible but forms a very small percentage of the overall view.

B.8.11 Descriptions of existing and estimated potential views of the development and an assessment of the significance of changes to each viewpoint are included in Table B8.5 below. The criteria for establishing impact of the changes to the views assessed are shown in Table B8.4.

B.8.12 Footpaths and sensitive landscape receptors in the vicinity of the site are shown on drawing number B8.2.

Baseline Conditions

Planning policy framework

B.8.13 Planning policies give an indication of the relative value placed on the landscape. These policies are prepared by local authorities and through the consultation process are judged to reflect the aspirations and values of a local community. The site falls in the Cherwell District Council area and full relevant policy details can be found in the Planning Statement which accompanies this submission and a summary within A4 of this ES.

B.8.14 Planning policy for the Cherwell district is contained in the saved policies of the Cherwell Local Plan, adopted 1996. This Plan has been replaced by the Non-Statutory Cherwell Local Plan 2011. However, despite work on the 2011 Plan being discontinued prior to adoption, it has been approved as interim planning policy for development control purposes prior to the adoption of the Local Development Framework. It is unknown when the latter document will be adopted.

B.8.15 Policies relating to landscape issues (countryside protection and landscape conservation) that cover the site and its landscape context include:

C7 "Development will not normally be permitted if it would cause demonstrable harm to the topography and character of the landscape."

C13 "The Ironstone Downs, the Cherwell valley, the Thames Valley, North Ploughley, Muswell Hill and Otmoor are designated Areas of High Landscape Value within which the Council will seek to conserve and enhance the environment."

C28 "Control will be exercised over all new development, including conversions and extensions, to ensure that the standards of layout, design and external appearance, including the choice of external-finish materials, are sympathetic to the character of the urban or rural context of that development. In sensitive areas such as Conservation Areas, the Area of Outstanding Natural Beauty and areas of High Landscape Value, development will be required to be of a high standard and the use of traditional local building materials will normally be required."

B.8.16 The relevant countryside related policies form the 2011 Local Plan include:

EN1 "In determining planning applications the Council will take into account the likely impact of a proposal on the natural and built environment and will seek to enhance the environment whenever possible. Development which would have an unacceptable environmental impact will not be permitted."

EN31 "Beyond the existing and planned limits of the towns of Banbury and Bicester development of a type, size or scale that is incompatible with a rural location will be refused."

EN34 "The Council will seek to conserve and enhance the character and appearance of the landscape through the control of development. Proposals will not be permitted if they would:
cause undue visual intrusion into the open countryside;
cause undue harm to important natural landscape features and topography;
be inconsistent with local character;

harm the setting of settlements, buildings, structures or other landmark features;
harm the historic value of the landscape."

B.8.17 In addition to the 2011 Local Plan policies and the Saved Policies of the 1996 Plan, there is supplementary planning guidance in the form of landscape character assessment documents. This level of continued assessment demonstrates the sensitivity and weight the Council places on its landscape resource. The four current studies are summarized below.

B.8.18 A Landscape Assessment of Cherwell District, produced by Cobham Resource Consultants in 1995, was taken forward in the Council's Countryside Design Supplementary Planning Guidance (SPG) of 1998. This was used by the District Council to develop a consistent coordinated approach to planning policy, development control, landscape management/conservation, recreation and tourism.

B.8.19 The site falls wholly in the Ironstone Hills and Valleys Character Area. The character assessment can be reviewed at the following weblink[24]. The assessment includes an Enhancement Strategy that evaluates and identifies guidelines for future management. The areais identified for both *"Conservation" and "Repair".* The authors recognised that there would be future development pressure on the landscape around Banbury and gave guidance on appropriate development strategies in that regard. Essentially, as Policy C28 above recognises, development is not precluded but:

"should only be permitted if it is sensitively sited and the scale, size, materials, and character of the scheme are designed to blend into the area, as is the case with much of the high quality infill housing found in many of the district's villages. Care needs to be taken, however, that the characteristic spatial structure of villages is not too greatly changed."

B.8.20 This character area forms part of an Area of Landscape of High Value (ALHV) identified in Policy C13 of the 1996 Local Plan. As Policy C28 above demonstrates,

24 http://www.cherwell.gov.uk/index.cfm/help/utilities/flashsetup/www.cherwell.gov.uk/index.cfm?articleid=2854&articleaction=form&formid=28

development in the ALHV is not precluded and indeed some land previously identified as farmland in the Oxfordshire Wildlife and Landscape Study (OWLS) (see below paragraph), has subsequently been developed.

B.8.21 Existing planning policy for the district is contained in the saved policies of the Cherwell Local Plan, adopted 1996. These are the policies used when making planning decisions. The saved policies can continue to be used until they are replaced by the Local Development Framework.

B.8.22 A Landscape Sensitivity and Capacity Assessment (LSCA) (Halcrow Group Ltd of Sept 2009) was undertaken as part of the Local Development Framework process. Consultation closed April 2010. The document can be accessed via the Cherwell District Council website at the following weblink[25]. The assessment considered a larger area than the site, and included land extending south to Wykham Lane, north to the Salt Way/Bloxham Road junction and east to White Post Road in Bodicte. Sensitivities and capacities for the wider site studied were identified as:

- *Landscape Sensitivity - High-Low*
- *Visual Sensitivity - Moderate*
- *Overall Sensitivity - High/Moderate*
- *Value - High/Low*
- *Capacity to accept development - Moderate/Low*
- *Capacity to accept playing fields - High/Low*
- *Capacity to accept informal recreation - High*
- *Capacity to accept woodland – High*

B.8.23 The LSCA text identifies that sensitivities and capacities vary across the site, but the different sensitivity and capacity areas have not been graphically identified. An interpretation of where the application site sits in the overall sensitivity/capacity assessment was, therefore, undertaken and identified in paragraphs B8.50 to B8.55 below.

25 http://www.cherwell.gov.uk/media/pdf/p/n/Landscape_Sensitivity_and_Capacity_Report_-_Part_1.Pdf

B.8.24 The site lies in Natural England's National Character Area 95, being Northamptonshire Uplands. This can be reviewed at weblink[26].

B.8.25 OWLS is an investigation of landscape character and biodiversity across the county, jointly sponsored by: Oxfordshire County Council, Natural England and The Earth Trust. The site falls wholly in landscape type *'Upstanding Village Farmlands'*, which is a *"hilly landscape with a strong pattern of hedgerows and nucleated villages characteristically built from the local ironstone."* A full description can be found using the following weblink[27], but its key characteristics are:

- *"steep sided, undulating landform;*
- *well defined geometric pattern of medium-sized fields enclosed by prominent hedgerows; and*
- *a strong settlement pattern of compact, nucleated villages of varying sizes with little dispersal in wider countryside."*

B.8.26 The immediate area of Bodicote is:

> *"characterised by large-sized fields dominated by arable farming, with some smaller grass fields used for pony grazing. They are enclosed by low hawthorn hedges which are generally in good condition. Hedges bordering roadsides and old lanes are taller, well-maintained and more species-rich. There are a few young ash, field maple and oak trees in the hedges, and some small tree clumps close to farms.*
>
> *.....Locally important habitats include plantations, semi-improved grassland, scrub and species-poor hedges with trees. There are also species-rich hedges bordering some roads and green lanes."*

26 http://www.english-heritage.org.uk/publications/wm-area-farmsteads-character-statements/95-Northamptonshire-Uplands.pdf

27 http://owls.oxfordshire.gov.uk/wps/wcm/connect/occ/OWLS/Home/Oxfordshire+Landscape+Types/Upstanding+Village+Farmlands/

B.8.27 Forces for change are identified as being:

- *"The hedgerow network is generally intact and in good condition, even in places dominated by intensive arable farming. However, around Bodicote the hedgerow pattern is weaker, with roadside hedges tending to be overgrown and internal field hedges generally low and gappy.*
- *There is some residential development within the main settlements that is out of character, particularly in the larger settlements to the south of Banbury. There are also some industrial estates, but they are generally well screened by landscape planting.*
- *Other land uses, such as the disused airfield and wireless station near Barford, can be visually intrusive."*

B.8.28 The landscape strategy recommends *"Conserve and enhance the strong pattern of hedgerows and hedgerow trees, and the nucleated settlement pattern and strong vernacular character of the villages"* and this should be achieved by:

- *"Strengthen and enhance the field pattern by planting up gappy hedges using locally characteristic species such as hawthorn, and hedgerow trees such as oak and ash.*
- *Promote environmentally-sensitive maintenance of hedgerows, including coppicing and layering when necessary, to maintain a height and width appropriate to the landscape type, particularly along roadsides.*
- *Conserve the surviving areas of permanent and ridge and furrow pasture on the steeper slopes and hillsides.*
- *Maintain the nucleated pattern of settlements and promote the use of building materials, characteristically the ironstones and slate tiles of the Northamptonshire Uplands, and a scale of development and that is appropriate to this landscape type.*
- *Enhance tree cover through small-scale woodland planting next to streamlines and on steeper hillsides, so that it does not block off views of the landscape, keeping the feeling of openness."*

B.8.29 Its key recommendations are to:

"Safeguard and enhance the landscape character of the hedgerow network."

Site description

B.8.30 The site consists of 6 relatively large and regularly shaped arable fields, defined by straight hedges and a woodland strip. For the purposes of this assessment, they are numbered site fields 1 - 6 from the west; 2 being north of 3.

B.8.31 The site is a complicated shape, broadly rectangular, on an east west axis, but with two 'chunks' of land removed – one being a field north of site field 2 at the north west corner and the other being a field and grounds of Wykham Farm Cottage property south of site field 5, near the site's south east corner.

B.8.32 The western and majority of the site area is occupied by a plateau at approximately 130m AOD, falling gently southeastwards from a high point of 133m AOD on the north western corner and steepening towards a low point of approximately 125M AOD on the southeastern corner. The plateau gradients vary broadly between 1: 45 and 1:50, whereas those on the land to the south steepen to 1:8. These steeper gradients roll northward in the east of the site and form the beginnings of a shallow dry valley, along which the hedge separating fields 5 and 6 has been planted. This feature runs southward beyond the site boundary, through the Wykham Farm, Great Barn and Wykham Farm Cottage complex, where it picks up a seasonal ditch emanating from the site, and continues south beyond Wykham Lane, eventually joining the Sor Brook south of the site.

B.8.33 A narrow tract of west facing land lies on the western edge of the site, with gradients as steep as 1:3. This is the beginning of another dry valley running southward outside the site, terminating south of Wykham Lane near Tudor Hall School. An access road to the school runs through this piece of land, with Wykham Park Lodge at its northern end.

B.8.34 Internally, field boundaries are generally straight and hedged, with occasional trees. A relatively immature north-south woodland strip separates site fields 5 and 6. The overall hedge structure is relatively strong, providing some visual containment on site, although because the fields are relatively large and, particularly on the plateau, relatively topographically uniform, there is a general feeling of openness on site.

B.8.35 The site's boundaries follow strong features on the ground. Either accompanied by, or comprising of, varying amounts of vegetation, they are the A361 Bloxham Road to the west, including a small, dense, triangular copse growing in the site's northern corner, an historic hedged track/green lane known as Salt Way to the north, a low field hedge to the east and to the south a narrow strip of young plantation effectively blocking views. The weakest boundaries are the hedges north of site field 2, west of site field 4 and east of site field 6 because they have no associated route and are the least substantial in terms of structure (width and height) and visual containment.

B.8.36 The site also supports three footpaths linking to Salt Way from the south. The most westerly one follows the majority of the western boundary, the central one crosses site field 5 and the most easterly one follows the narrow woodland strip between site fields 5 and 6. These footpaths continue beyond the site boundary linking Salt Way with Wykham Lane located south of the site. Salt Way forms a traffic free section of the national sustrans network, and is accessed at points outside the site - just to the west of White Post Road and at its junction with Bloxham Road.

Immediate site environs

B.8.37 The site's immediate context is built development to the north, being the southern extent of Banbury. Easington School and residential development lie immediately north of Salt Way, the well defined and strong hedgerow lined track, forming the majority of the site's northern boundary. Built development in the form of Bodicote lies to the east, separated from the site by relatively level agricultural land, a cricket/sports ground and recreation area.

B.8.38 The A361 Banbury to Chipping Norton road forms the western boundary of the site with a triangle of land, occupied mainly by the Tudor Hall School playing fields, separating the site and the road further south. Agricultural land lies south of the site, extending to and beyond Wykham Lane, which runs east west approximately 500m south of the site and is a narrow local road, displaying rural characteristics. Several properties including WPF and Wykham Farm lie off it to the north and Tudor Hall School building complex to the south. Other land uses in the immediate site area include allotments and a cemetery, both south east of the site and lying north and south of Wykham Lane respectively.

Character of the surrounding area

B.8.39 WPF is located in a wider largely agricultural area adjacent to the southern edge of Banbury, between the A361 to the west and the A4260 Banbury to Oxford road to the east. It follows a low local ridge southeast of the site, passing through Bodicote, Twyford and Adderbury. The M40 lies approximately 2km east of the site's eastern boundary, with Junction 11 approximately 3.5km to the north east. They are separated by Banbury's residential southern extent and the village of Bodicote. The hamlet of Broughton lies 2km to the west and the villages of Bloxham and Adderbury some 2.5km to the south. The Sor Brook, a tributary of the River Cherwell, meanders broadly west east in a steep sided valley approximately 1km south of the site. There are numerous references to 'mills' along its length. This area south of the Sor Brook falls in an Area of High Landscape Value identified in the 1996 Local Plan.

B.8.40 The site lies in a wider context of arable and pastoral agricultural landscape of complicated, undulating topography. Land gradually rises to the west again encompassing small nucleated settlements such as Sibford Ferris, Sibford Gower and Upper Brailes, with numerous localised highpoints forming distinctive hills to an elevation exceeding 200m AOD, some of which display evidence of historic fortifications. The landscape is dotted with individual farmsteads and numerous small hamlets and villages, many with Conservation Area designations, including one covering central Bodicote south of White Post Road. Spires and telecommunication masts are frequent features. Fields vary in size but are generally regular and linear, defined by a mixture of stockproof fencing, hedgerows and hedges. The Sor Valley to the south of the site and the majority of its adjacent fields, support narrow but continuous and complete hedgerows. This vegetation gives the immediate area substantial physical and visual containment.

B.8.41 Extensive woodland and shelterbelts are uncommon, although there are numerous copses and small blocks of mature deciduous woodland such as that on Crouch Hill to the north west of the site and immediately south of Wykham Lane. There are also isolated clusters of structural vegetation, particularly parkland type trees, such as those at Tudor Hall School, Broughton Grange and Broughton Castle, to the south west of the site. These small but frequent vegetation blocks combine effectively with the local topography to interrupt and contain views.

B.8.42 A comprehensive network of rights of way criss crosses the general area.

Visibility of the site

B.8.43 A field investigation has identified representative public viewpoints (visual receptors) of the site. These are mainly within a radius of approximately 3.5km of site, because beyond this the naked eye is generally unable to distinguish great detail and the site will form a small percentage of what will inevitably be a panoramic view. The photo locations are shown on drawing number B8.1.

B.8.44 The site, from both short and long distances to approximately 3.5km, is not visually prominent. The A4260 ridge line effectively blocks views from the east. Strong boundary vegetation combines with the local topography and surrounding vegetation, particularly that to the south. In fact the site is quite difficult to locate in the wider landscape from longer distance views to the south, and is identifiable principally by reference to the large conifers growing at Tudor Hall School and Broughton Grange. The site's northern plateau and its steeper southern slopes are obscured by on and off site topography and vegetation. Views of the site from the north include close but clear glimpses of the northern plateau through gaps in the Salt Way vegetation. From the east, the north and east parts of the site are just discernable, across the open field and cricket/sports ground filtered by a series of low, relatively weak hedges. These hedges and the eastern site boundary would currently be insufficient to effectively visually contain potential built development on the eastern part of the site. Close views from the south are unavailable due to the effective visual barrier formed by the southern boundary vegetation.

B.8.45 The clearest overview of the site in its context is from a footpath on the eastern slope of the high point of Crouch Hill north east of the site. This is a well frequented local landmark with numerous footpaths, at the base of which runs Salt Way. Although seen as part of a wide panorama containing built elements, specifically the Walter Drive residential development immediately to its east, the site's northern plateau is a prominent middle distance element in a mainly rural view. This view, however, is tempered by tree growth along the A361, in particular the triangular copse on the north of the site, visually filtering and splitting it up, and therefore, reducing its prominence.

B.8.46 Close residential properties, although not forming part of this assessment, are few in number. Those closest to the site lie to its north, in the form of suburban detached houses off Beaconsfield Road and Sycamore Drive, south of the site in the form of individual country residences accessed off Wykham Lane, and to the west are Wykham Park Lodge lying between the site and Bloxham Road and Crouch Cottages bordering the west of Bloxham Road, immediately opposite the proposed roundabout access into the site. Those to the south sit at a lower elevation to the site, and combined with the substantial southern boundary vegetation, views of the site are thought to be effectively blocked. Views from all others are thought to be heavily filtered by boundary vegetation.

Visual sensitivity

B.8.47 A consideration of the combination of the sensitivity of visual receptors and the magnitude of the change determines the level of significance of the predicted impact. Residential properties (although not forming part of this assessment) and places visited for leisure activities, for example footpaths and heritage features, are considered to be of high sensitivity, whereas industrial landscapes, major roads and places of work are considered to be of low sensitivity. The impact significance is determined by the sensitivity of the receptor, the distance of the receptor to the development, the extent of change in the view, the number of viewers affected and the duration of activity apparent from each viewpoint, or a sequence of points that may have transient views (e.g. along a road or footpath).

B.8.48 The following have been used to establish a judgement concerning visual effect significance:

- Large-scale views which introduce new, discordant or intrusive elements are more likely to be significant than small changes or changes involving features already present in the view;
- Changes in views from recognised and important or amenity routes are likely to be more significant than changes affecting less important paths and roads; and
- Changes affecting large numbers of people are generally more significant than those affecting a relatively small group of users. However, in relatively remote or tranquil landscapes, where numbers could be low, the sensitivity

of the users may be very high and and this could be reflected in the significance of the change.

B.8.49 The assessment analyses the value and sensitivity of the landscape, which is a measure of its capacity to accommodate change without loss of character. The magnitude of landscape effects depends on the type and character of development proposed compared with the type and character of the receiving landscape and its context. The criteria for establishing impact of the changes to the landscape resource are shown in Table B8.3. Any long-term residual changes are also noted.

Landscape value

B.8.50 Landscape value is subjective, and is based on the importance to society of the affected landscape, based on, and taking into account, views of consultees and the public.

B.8.51 Information about what is important about the landscape and why, is required in order to:

- Establish the level of importance of the affected landscape and whether this is at a local, regional or national level;
- Enable any losses of landscape features, characteristics, or functions to be assessed in relation to the importance or value attached to them;
- Enable the effects on other, less tangible, perceptual landscape characteristics to be assessed such as scenic quality, tranquillity or wilderness;
- Assist in identifying features which could be enhanced; and
- Identify mitigation proposals, through avoidance or relocation, by appropriate remedy or offsetting negative effects through compensatory measures.

B.8.52 This assessment has used the industry standard GLVIA (Table 1) to help establish site's current landscape value in combination with the interpretation of the LSCA. The value of the landscape contributes to its overall sensitivity to development which is the degree to which a particular landscape type or area can accommodate change arising from a particular development, without detrimental effects on its character. This will vary with:

- existing land use;
- the pattern and scale of the landscape;
- visual enclosure/openness of views, and distribution of visual receptors;
- the scope for mitigation, which would be in character with the existing landscape and
- the value placed on the landscape.

B.8.53 In combination with the LSCA, this assessment has taken the following factors into account in establishing the site's sensitivity to development:

- the LPA chose not to include the application site in the ALHV designation in the Local Plan of 1996;
- the boundary vegetation combined with the internal hedge structure provides a significant visual filter to external views, both screening parts of the site and breaking it up into smaller parcels of land;
- the site is not intervisible with surrounding urbanising elements although has a direct relationship with the built southern edge of Banbury, via and through Salt Way and is sufficiently distant from, and so will not to cause an impact on, Bodicote Conservation Area;
- in addition to the site being undeveloped 'open countryside', the local community is likely to have regard for the site as a whole due to its proximity and the leisure opportunities it presents (footpath links).

B.8.54 As the LPA have placed landscape value on neither the site nor the surrounding area, its value, therefore, both as an individual site and as part of a wider landscape, has been acknowledged as being of no particular consequence in terms of 'conservation' and 'preservation' of its current character. The landscape value of the site is, therefore, considered to accord with the interpretation of the LSCA, being:

- Landscape Sensitivity – **Low/moderate** overall, but increasing to high to the east towards Bodicote;

- Visual Sensitivity – **Moderate** with impacts primarily on users of Salt Way;
- Overall Sensitivity – **Moderate** apart from around Wykham Park, Wykham Farm (both listed) and the edge of Bodicote which are high;
- Value - **Low**, apart from farm settings and paths which are high;
- Capacity to accept development – **Moderate**, but low in farm settings and paths;
- Capacity to accept playing fields – **High** on flatter areas;
- Capacity to accept informal recreation – **High**;
- Capacity to accept woodland – **High**.

B.8.55 Where sensitivities are shown as 'low' and capacities as 'high', it does not mean that the LPA are unconcerned with the development's aesthetics and impacts on the wider accepting landscape (considered below). Although no specific landscape value has been placed upon the site, or the land in which it sits, adverse impacts will require minimizing and the highest design standards applied.

Value

B.8.56 Table B.8.1 explains how criteria are applied to arrive at an assessment of landscape value and is contained in the GLVIA. These criteria have been applied to this assessment.

B.8.1 Table 1 – Criteria for the assessment of landscape value

Value		Typical criteria	Typical scale	Typical examples
High	Exceptional	High importance and rarity. No or very limited potential for substitution	International /National	World Heritage site, National Park, AONB
	High	High importance and rarity. Limited potential for substitution	National, regional & local	National Park, AONB, AHLV / AGLV etc
Medium	Medium	Medium importance and rarity. Limited potential for substitution	Regional, local	AHLV/AGLV, Regional Scenic Areas etc
	Medium-low	Medium importance and rarity. Some or good potential for substitution	Regional, local	Undesignated but value expressed for instance in demonstrable use

Value		Typical criteria	Typical scale	Typical examples
Low	Poor	Low importance and rarity	Local	Areas identified as having some redeeming feature or features and possibly identified for improvement
	Very poor	Low importance and rarity	Local	Areas identified for recovery

Magnitude

B.8.57 Table B.8.2 below explains how criteria are applied to arrive at an assessment of magnitudes that have been applied to this assessment.

Table B.8.2 – Criteria for the assessment of magnitude

Level	Typical criteria
Negligible	Very minor loss of or alteration to key elements/features/characteristics of the baseline, i.e. pre - development landscape or view and/ or introduction of elements that are not uncharacteristic with the surrounding landscape - approximating the 'no change' situation.
Low	Minor loss of or alteration to key elements/ features/characteristics of the baseline, i.e. pre- development landscape or view and/or introduction of elements that may not necessarily be considered to be uncharacteristic when set within the attributes of the receiving landscape.
Medium	Partial loss of or alteration to key elements/features/characteristics of the baseline, i.e. pre-development landscape or view and/ or introduction of elements that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving landscape.
High	Total loss, or major alteration, of key elements/features/characteristics of the baseline, i.e. pre-development landscape or view and/ or introduction of elements considered to be totally uncharacteristic when set within the attributes of the receiving landscape.

Significance

B.8.58 Overall impacts may be adverse (worsens), neutral (either does not change or changes but neither worsens nor improves) or beneficial (improves), and take into account mitigation measures, and at different stages of the project lifecycle. Intermediate levels, such as slight – moderate, may also apply. Tables B.8.3 and B.8.4 assign criteria to each landscape and visual level, as applied in this assessment.

Table B.8.3 – Significance criteria for landscape impact

Level	Typical criteria
No change	No discernable deterioration or improvement in the existing landscape
Imperceptible	The degree of change is so small as to have little or no effect
Slight adverse	The proposals would not quite fit into the landform and scale of the landscape; affect an area of recognised landscape character
Slight beneficial	The proposals would improve landscape quality and character; fit in with the scale, landform and pattern of the landscape; enable the restoration of valued characteristic features partially lost through other land uses
Moderate adverse	The proposals would be out of scale with the landscape or at odds with the local pattern and landform; will leave an adverse impact on a landscape of recognised quality
Moderate beneficial	The proposals have the potential to fit in very well with the landscape character; improve the quality of the landscape through removal of damage caused by existing landuses
Substantial adverse	The proposals cannot be fully mitigated and may cumulatively amount to a severe adverse effect; are at a considerable variance to the landscape degrading the integrity of the landscape; substantially damaging to a high quality landscape
Severe adverse	The proposals are wholly at variance with the landform, scale and pattern of the landscape; changes permanently degrade, diminish or destroy the integrity of valued characteristic features, elements and /or their setting; a high quality landscape would be permanently changed and its quality diminished.

Table B.8.4 – Significance criteria for visual impact

Level	Typical criteria
No change	No discernable deterioration or improvement in the existing view. No part of the development, or work or activity associated with it, is discernible
Imperceptible	The degree of change is so small as to have little or no effect. Only a very small part of the proposals is discernible and/or they are at such a distance that they are scarcely appreciated. Consequently they have very little effect on the scene
Slight	The proposals would cause a barely perceptible change to the view. The proposals constitute only a minor component of the wider view, which might be missed by the casual observer or receptor. Awareness of the proposals would not have a marked effect on the overall quality of the scene
Moderate	The proposals have a noticeable effect on the view. The proposals may form a visible and recognisable new element within the overall scene and may be readily noticed by the observer or receptor
Substantial	The proposals would cause a substantial effect on the view. The proposals form a significant and immediately apparent part of the scene that affects and changes its overall character

Level	Typical criteria
Severe	The proposals become the dominant feature of the scene to which other elements become subordinate and they significantly affect and change its character

Relevant details of the development

B.8.59 Reference should be made to section A2 of this planning application for a full description of the development and drawing number JJG043/27/B. However the basic development will consist of:

- a roundabout on Bloxham Road providing the site access via an internal spine road;
- 1000 residential units;
- commercial and employment (B1) buildings with ancillary offices;
- a local centre including retail, food retail, community and leisure uses;
- a primary school;
- green infrastructure including retention and enhancement of significant hedgerows and woodland areas, where appropriate, strategic open space comprising parks with sports pitches, play areas, informal public open spaces, allotments and new structure planting;
- infrastructure including roads, footpaths, cycleways and sustainable drainage features including ponds and watercourses; and
- the maximum building height will be 10m across the development.

B.8.60 The main actions affecting the site landscape and/or having the potential to give rise to visual impacts over the life of the proposed development are listed below although it is recognised that each phase will have its own construction cycle. The sequence of works in relation to the infrastructure works, development timescales and order of the individual development blocks is unknown. The works shown below are, therefore, merely an attempt at the scope and chronological order of the elements of the whole development that could cause a potential impact. Individual operations may be phased, many of the operations will be carried out concurrently, and some, for example erection and removal of hoarding, will be repetitious. The duration of the potential impacts is identified in brackets:

- movement of site plant and staff including lighting and headlights during the hours of darkness (temporary);
- erection of boundary security fencing/hoarding (temporary);

- site clearance including removal of vegetation (east of Bloxham Road to form the roundabout) internal hedgerows and gaps formed in internal and boundary hedge vegetation (permanent);
- excavation / groundworks for the Bloxham Road roundabout, internal roads, balancing ponds, major service runs and development platforms - presumed cut and fill balance to be achieved on site;
- construction of the spine road;
- spine road planting;
- construction of remainder of infrastructure road network;
- infrastructure road network planting;
- erection of individual plot infrastructure, buildings and structures including use of cranes and scaffolding;
- completion of public realm works;
- occupation/operation lighting;
- individual development plot planting and
- removal of boundary security fencing/hoarding.

B.8.61 Work will generally be carried out in the daytime, with occasional night time works as necessary, and so the use of plant and vehicle headlights associated with the development will be restricted to early mornings and evenings for a few months in the winter.

B.8.62 It is anticipated that, subject to gaining planning permission, construction may commence in 2014, and be completed by 2022.

B.8.63 It has been assumed that if the proposed development were not to go ahead, that the landscape character would remain as the current situation, with the land continuing to be used and managed for agricultural purposes.

Potential impacts - landscape

B.8.64 The main features of the development that will have a landscape impact are listed above. The impact on landscape character is based on its baseline value assessment, taking into account its perceived importance, features, setting and immediate landscape context. That for the site as a whole is low/moderate, but increasing to high to the east towards Bodicote. The landscape impact on the site can be divorced

from the impact on the wider landscape because intervisibility is not a key character of the site.

B.8.65 The magnitude of the development is the same for both landscape and visual impacts, and has been determined by reference to Table B.8.2. The magnitude of the development proposals on the site has been judged as being **low – medium**, because the site lies adjacent to, and is seen in the context of, Banbury's southern built edge. Any tranquillity the site currently has will be removed from the outset of construction works.

B.8.66 In essence, the site has landscape features that significantly contribute to its character and provide visual containment to views across and into the site. The site's natural topography is such that it could remain legible on completion of the development, depending on if landuses are suited to their precise location and ground works can be kept to a minimum.

B.8.67 The development will, therefore, result in the loss of few key characteristics (topography or vegetation cover) of the pre-development landscape, and the introduction of built elements that may be of a prominent scale, cannot be considered to be uncharacteristic when set against the urban edge context.

-

B.8.68 With regard to significance of the development, it is assumed it will be well and appropriately designed and detailed, with well considered spaces including set in an existing mature landscape by the retention of the majority of existing vegetation. The precise level of vegetation removal is uncertain, and the removal of tree growth along Bloxham Road will be of significance and will cause the largest adverse landscape impact. This will be tempered, it is assumed, by significant internal tree planting, with low density and heavily planted development fronting the rural boundaries. The overall landscape impact that the development will cause will be **slight adverse** on the baseline landscape at the outset. This is because the proposals although developing a previously undeveloped site, will retain the site's essential topography and the majority of its vegetation. Tranquillity will fluctuate, and be most marked at construction and around the roundabout and spine road.

Potential impacts - visual

B.8.69 The main features of the development that will have a visual impact are listed section B8.59. A summary of representative view point descriptions is shown in Table B.8.5 below, and relates to the views shown in drawing numbers B8.3 – B8.20. Changes to views have been assessed during construction and on day 1 of completion of the entire development. Assumed numbers of viewers/receptors are relative to each other.

B.8.70 It should be remembered that:

- where thin or narrow deciduous planting filters views of the site, it is likely to be more obvious when leaf drop has occurred;
- sensitivities to adverse visual impacts and the presence of large development generally reduces with time; and
- the site will become progressively less obvious and better assimilated into the receiving landscape as vegetation matures.

Table B.8.5 – Representative viewpoint summary

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
Viewpoint 1 Drawing B8.3	Close view looking north from Wykham Lane where it is met by the footpath on the western site boundary. The view is of the steeper topography outside the site's western boundary. The dark tree line on the centre left horizon is the vegetation separating the site from the A361. It is assumed that this view will be experienced by **few** - **moderate** numbers of people, presumed to mainly be pedestrians, and vehicle passengers to a lesser extent, with a **high** and **moderate** respectively sensitivity to change.	The development will not make physical changes to this view. However, cranes may just be discernible and there may be a glow of plant and machinery activity including possible headlights during the hours of darkness during construction. Static and moving headlights may be visible at leaf drop. Post construction the glow of occupation and operational lighting will be visible during the hours of darkness. Static and moving headlights may be visible at leaf drop. In due course, depending on species, size at planting and rate of growth, tree tops may also just be discernible.	**Nil/ imperceptible** during construction and occupation/operation. Impacts during construction will be temporary. Impacts during occupation/operation will be permanent.
Viewpoint 2 Drawing B8.4	Close view looking north through a gap in the hedge north of Wykham Lane, across a field of asparagus. The site's southern boundary is the vegetation strip on the central horizon. The individual trees on the far right horizon are those in the grounds of Wykham Farm. The building roof can just be seen nestling amongst them. It is assumed that this view will be experienced by **few** people, presumed to mainly be vehicle passengers, with a **moderate** sensitivity to change.	The development will not make physical changes to this view. However, cranes may just be discernible and there may be a glow of plant and machinery activity including possible headlights during the hours of darkness during construction. Static and moving headlights may be visible at leaf drop. Post construction the glow of occupation and operational lighting will be visible during the hours of darkness. Static and moving headlights may be visible at leaf drop. In due course, depending on species, size at planting and rate of growth, tree tops may also just be discernible.	**Nil/ imperceptible** during construction and occupation/ operation. Impacts during construction will be temporary. Impacts during occupation/operation will be permanent.

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
Viewpoint 3 Drawing B8.5	Close view looking north through a gap in the hedge north of Wykham Lane. Houses on Foxwood and Leabrook Close at Banbury's southern edge can be seen against a vegetated backdrop to the left of the hedge on the right of the view. This hedge is the eastern boundary of the site and the rear half of the adjacent field in front of the Foxwood and Leabrook Close houses forms part of field 6. The curved roofed buildings in the centre are part of Echo Warren, with Wykham Farm Cottage behind and to their right. The vegetation on the horizon to the right is the narrow woodland strip between fields 5 and 6. It is assumed that this view will be experienced by **few** people, presumed to mainly be vehicle passengers, with a **moderate** sensitivity to change.	Built development will not be seen in this view, although cranes may just be discernible and there may be a glow of plant and machinery activity including possible headlights during the hours of darkness during construction. Static and moving headlights may be visible at leaf drop. Post construction the glow of occupation and operational lighting will be visible during the hours of darkness. Static and moving headlights may be visible at leaf drop. In due course, depending on species, size at planting and rate of growth, tree tops may also just be discernible. That part of field 6 in the view is planned as allotments with play space to the south. It is assumed that a dense hedge will define their southern boundary, and eventually screen views of the allotments and existing houses on Foxwood and Leabrook Close beyond.	**Moderate/slight adverse** during construction, reducing to **slight adverse** at initial operation reducing to **slight beneficial** as the allotment's southern hedge matures.
Viewpoint 4 Drawing B8.6	Close view looking west from White Post Road in Bodicote, across the recreation ground and cricket pitch. Cars parked at the allotments can be seen near the centre left horizon, behind which is the site's eastern woodland strip, which extends to the right, across the width of the view. Higher land west of the site forms a backdrop on the left, beyond residences lying south of the recreation ground. It is assumed that this view will be experienced by **moderate** numbers of people, presumed to mainly be pedestrians, and vehicle passengers to a lesser extent, with a **moderate - high** and **moderate - low** respectively sensitivity to change.	Built development will not be seen in this view, although cranes may just be discernible and there may be a glow of plant and machinery activity including possible headlights during the hours of darkness during construction. Static and moving headlights may be visible at leaf drop. Post construction the glow of occupation and operational lighting will be visible during the hours of darkness. Static and moving headlights may be visible at leaf drop. In due course, depending on species, size at planting and rate of growth, tree tops may also just be discernible.	**Nil/ imperceptible** during construction and occupation/ operation. Impacts during construction will be temporary. Impacts during occupation/operation will be permanent.

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
Viewpoint 5 Drawing B8.7	Close view looking south west from a footpath junction with Salt Way. The site's low eastern boundary hedge can just be seen visually merging with the base of the site's woodland strip which occupies approximately 85% of the skyline. The hedge on the right of the view marks Salt Way's southern boundary. Higher land to the west can just be seen forming a backdrop on the left of the view. It is assumed that this view will be experienced by a **moderate** number of pedestrians, with a **high** sensitivity to change	Field 6 beyond the low boundary hedge in the view is planned as allotments with play space to the south. Built development will not be seen in this view, although cranes may just be discernible above the woodland strip to be maintained. A glow of plant and machinery activity including possible headlights during the hours of darkness during construction will be visible. Static and moving headlights may be visible at leaf drop. Post construction the glow of occupation and operational lighting will be visible during the hours of darkness. Static and moving headlights may be visible at leaf drop. In due course, depending on species, size at planting and rate of growth, tree tops may also just be discernible. It is assumed that the development's eastern boundary hedge will be significantly strengthened.	**Slight adverse** during construction, reducing to **slight/imperceptible adverse** at initial operation reducing to **nil/ imperceptible** as the development's eastern hedge matures.
Viewpoint 6 Drawing B8.8	Close view looking south across site field 5, from a footpath junction with Salt Way. The site's southern boundary vegetation forms approximately 45% of the skyline, with the roof of Wykham Farm Cottage just visible amongst it to the left of the telegraph pole. The vegetation on the left of the view is the hedge between site fields 5 and 6, and that to the right separating fields 5 and 4. Higher land to the west can just be seen forming a backdrop on the left of the view. It is assumed that this view will be experienced by a **moderate** number of pedestrians, with a **high** sensitivity to change.	Built development will be seen above the hedge on the right of the view in field 4. The main temporary visual changes during construction will include: • loss of undeveloped agricultural land; • hoardings; • cranes and scaffolding; • site plant and staff movement; • building, plant and machinery lighting; • temporary compounds (construction staff carpark, offices etc);	**Substantial adverse** during construction and operation. Impacts will be permanent.

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
Viewpoint 6 (cont)		The main visual changes of the permanent development will include: • introduction of residential buildings (mainly 2 storey); • occupation and operational lighting during the hours of darkness. The main temporary visual changes during construction in the main part of the view (field 5) will include: • site plant and staff movement; • building, plant and machinery lighting; The main permanent visual changes in the main part of the view (field 5) will include: • creation and use of play space It has been assumed that a view from this location will remain available even if the footpath is diverted.	
Viewpoint 7 Drawing B8.9	Close filtered view looking south across site field 4, from Salt Way. The site's southern boundary vegetation forms approximately 45% of the skyline, with the roof of Wykham Farm Cottage just visible amongst it to the left of the telegraph pole. The vegetation on the left of the view is the hedge between site fields 5 and 6, and that to the right separating fields 5 and 4. It is assumed that this view will be experienced by a **moderate** number of pedestrians, with a **high** sensitivity to change.	A filtered view of the built development will be seen through gaps in the hedge in the view's foreground. The main temporary visual changes during construction will include: • loss of undeveloped agricultural land; • foreshortening of view; • hoardings; • cranes and scaffolding; • site plant and staff movement; • construction lighting, • moving and static headlights;	**Moderate/substantial adverse** during construction and operation. Impacts will be permanent.

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
Viewpoint 7 (cont)		• temporary compounds (construction staff carpark, offices etc); The main visual changes of the permanent development will include: • introduction of residential buildings (mainly 2 storey); • occupation and operational lighting during the hours of darkness; • introduction of additional planting south of Salt Way • foreshortening of view.	
Viewpoint 8 Drawing B8.10	Long distance view looking south west towards Banbury (the built development centre right above the gate) and Bodicote, the majority of which is screened from view by the foreground hedge. The 2 long, low buildings just below the skyline above and to the left of the foreground hedge are located on the eastern edge of Bodicote, north of Canal Lane. The site lies to their right, screened from view by the foreground hedge. The M40 motorway can just be seen below and to their left. It is assumed that this view will be experienced by a **few - moderate** number of people, presumed to mainly be vehicle passengers, with a **moderate** sensitivity to change.	The development will not impact on this view.	**Nil**

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
Viewpoint 9 Drawing B8.11	Long distance view looking north west towards the low ridge south east of the site and the A4260. The middle distance buildings to the left are at Twyford Wharf adjacent to the Oxford Canal. Manor Farm house, located west of the M40 and between Bodicote and Twyford, can just be seen amongst trees on the left horizon, immediately left of the large middle distance tree canopy. The site lies well beyond the ridge and is not visible in the view. It is assumed that this view will be experienced by a **few - moderate** number of people, presumed to mainly be vehicle passengers, with a **moderate** sensitivity to change.	The development will not impact on this view.	**Nil**
Viewpoint 10 Drawing B8.12	Middle distance view looking north west. Bodicote's southern edge can be seen near the centre right horizon. Trees in Tudor Hall School grounds can be seen on the centre left horizon. The site lies obscured by trees south of Wykham Lane extending on the horizon right of the school. It is assumed that this view will be experienced by a **few** pedestrians, with a **high** sensitivity to change.	The development will not impact on this view.	**Nil**
Viewpoint 11 Drawing B8.13	Middle distance view looking north across the Sor Brook. The tall individual conifer trees on the centre left horizon are in Tudor Hall School grounds. The site lies obscured by trees south of Wykham Lane extending on the horizon right of the school. It is assumed that this view will be experienced by a **few - moderate** number of people, presumed to mainly be vehicle passengers, with a **moderate** sensitivity to change.	The development will not impact on this view.	**Nil**

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
Viewpoint 12 Drawing B8.14	Middle distance view looking north across the Sor Brook. The curved roofs just below the tall trees on the centre right horizon are part of Echo Warren, with the narrow woodland strip between fields 5 and 6 on the horizon to their right. Site field 6 lies to the right of the trees. The remainder of the site lies to their left, screened by southern boundary and Wykham Lane vegetation. It is assumed that this view will be experienced by **few** - **moderate** numbers of people, presumed to mainly be pedestrians, and vehicle passengers to a lesser extent, with a **high** and **moderate** respectively sensitivity to change.	Built development will not be seen in this view, although cranes may just be discernible and there may be a glow of plant and machinery activity including possible headlights during the hours of darkness during construction. Static and moving headlights may be visible at leaf drop. Post construction the glow of occupation and operational lighting will be visible during the hours of darkness. In due course, depending on species, size at planting and rate of growth, vegetation on the southern boundary of field 6 may just be discernible.	Temporary construction impacts will be **nil-imperceptible**. Permanent development impacts at occupation/ operation will be **nil - imperceptible**
Viewpoint 13 Drawing B8.15	Long distance view looking north east over the Sor Brook from a footpath north of Bloxham. The 4 tall conifer trees near the centre right horizon are in the Tudor Hall School grounds, with the building to the right amongst vegetation being part of the WPF building complex. The site lies beyond, and is screened by, the line of dark vegetation above WPF. It is assumed that this view will be experienced by a **few** pedestrians, with a **high** sensitivity to change.	The development will not impact on this view.	**Nil**
Viewpoint 14 Drawing B8.16	Long distance view looking north east over the Sor Brook from Ell's Lane, north of Bloxham. The 4 tall conifer trees on the centre left horizon are in the Tudor Hall School grounds. The site lies to their right, obscured by trees south of Wykham Lane extending on the horizon right the of the school. It is assumed that this view will be experienced by a **few - moderate** number of people, presumed to mainly be vehicle passengers, with a **moderate** sensitivity to change.	The development will not impact on this view.	**Nil**

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
Viewpoint 15 Drawing B8.17	Close view looking south east from a footpath on Crouch Hill's south eastern slope. The site is seen over the roofs of the Walter Drive residential development, and is visually split by trees along Bloxham Road. Part of site fields 2 and 3 can be seen to their right, and part of site fields 2 and most of 4, to their left. The view of field 5 is currently filtered by its western hedge boundary, and field 6 is completely screened by the narrow woodland strip to its west. The site occupies approximately 75% of the width of the view. Higher ground to the east forms a distant backdrop over the entire width of the view. The Horgan land is the sliver of green field immediately above the Walter Drive development and to the left of field 2. Part of Crouch Cottages can just be seen in vegetation to the right of the view. It is assumed that this view will be experienced by a **few - moderate** number of pedestrians, with a **high** sensitivity to change.	The main temporary visual changes during construction will include: • hoardings; • cranes and scaffolding; • site plant and staff movement; • construction lighting, • moving and static headlights; • temporary compounds (construction staff carpark, offices etc); The main visual changes of the permanent development include: • removal of tree vegetation to the east of Bloxham Road (precise extent uncertain); • introduction of residential buildings (mainly 2 storey) on fields 2 - 5 and employment and local centre building roofs in field 1; • occupation and operational lighting during the hours of darkness. This view will be seen in conjunction with the Horgan land development. Cumulative impacts will not be caused.	Temporary construction impacts will be **moderate - substantial adverse**. Permanent development impacts will initially be **moderate - substantial adverse** gradually reducing to **moderate adverse** if and when potential replacement planting to Bloxham Road matures.

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
Viewpoint 16 Drawing B8.18	Close view, looking south east into site field 1, from the footpath on the site's western boundary. The steeper land outside the site to the west can be seen on the right of the view, with Bloxham Road vegetation on its right. Horizons are formed by site hedges – that to the left is between site fields 1 and 2, the central vegetation above is between fields 2 and 3, and that to the right is between 1 and 3. The taller dark vegetation on the extreme right of the view is vegetation on the site's southern boundary. The Horgan land lies beyond the hedge to the left of the view. It is assumed that this view will be experienced by a **moderate** number of people, both pedestrians with a **high** sensitivity to change, and vehicle passengers with a **low** sensitivity to change.	The main temporary visual changes during construction will include: • removal of tree vegetation to the east of Bloxham Road (precise extent uncertain); • removal of hedge vegetation (permanent change); • roundabout and spine road construction works; • hoardings; • cranes and scaffolding; • site plant and staff movement; • construction lighting, • moving and static headlights; • temporary compounds (construction staff carpark, offices etc); The main visual changes of the permanent development will include: • removal of all hedge vegetation with the exception of the southern boundary; • introduction of roundabout and spine road; • introduction of residential buildings (mainly 2 storey) on fields 1 - 3 and employment and local centre buildings in field 1; • occupation and operational lighting during the hours of darkness; • site planting. This view will be seen in conjunction with the Horgan land	Temporary construction impacts will be **severe adverse**. Permanent development impacts will be **severe adverse**.

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
		development. Cumulative impacts will not be caused.	
Viewpoint 17 Drawing B8.19	Close view, looking south east into site field 2 through a gap in Bloxham Road vegetation on the footpath on the site's western boundary and the entrance to WPF shop lane. The horizon is formed by the hedges between site field 2 and fields 3 and 4. It is assumed that this view will be experienced by a **moderate** number of people, both pedestrians with a **high** sensitivity to change, and vehicle passengers with a **low** sensitivity to change.	The main temporary visual changes during construction will include: • removal of tree vegetation to the east of Bloxham Road (precise extent uncertain); • removal of hedge vegetation between fields 2 and 3 (permanent change); • spine road construction works; • hoardings; • cranes and scaffolding; • site plant and staff movement; • construction lighting, • moving and static headlights; • temporary compounds (construction staff carpark, offices etc); The main visual changes of the permanent development include: • removal of hedge vegetation between fields 2 and 3; • introduction of spine road; • introduction of residential buildings (mainly 2 storey); • occupation and operational lighting during the hours of darkness; • site planting.	Temporary construction impacts will be **substantial adverse**. Permanent development impacts will be **substantial - moderate adverse**.

Receptor	Description of existing view	Description of proposed view including mitigation	Visual impact significance
Viewpoint 18 Drawing B8.20	Long distance view looking east from a footpath north west of Broughton. The buildings just below the centre horizon are residences on Burns Road, on Banbury's western edge. The site lies to their right, hidden by topography and vegetation. It is assumed that this view will be experienced by a **few** pedestrians, with a **high** sensitivity to change.	The development will not impact on this view.	**Nil**

B.8.71 The development will also indirectly cause slight adverse visual impacts in the form of additional traffic egressing the site and using the local road network, being temporary during construction and permanent at operation. Traffic management will also be required to construct the Bloxham Road roundabout, causing temporary substantial adverse visual impact. Vegetation removal on the east of Bloxham Road will also be required, both to construct the roundabout and achieve adequate visibility. This will open up clear and close views of the development from Bloxham Road, resulting in substantial adverse landscape and visual impact, reducing to slight-moderate adverse as vegetation matures.

B.8.72 Close private residential views of the site, although not forming part of this assessment, are thought to be limited in number, with potentially adverse changes. Changes to views from those to the south, with a view of the site heavily filtered by boundary vegetation, are likely to be slight - nil, increasing to slight during leaf fall. Those from Wykham Park Lodge west of the site may include filtered views of employment buildings. It is unknown to what extent the western boundary will be strengthened. It is likely that a greater potential impact will be psychological, caused by the receptor's proximity to development on land that was previously 'open countryside'.

Residual impact

B.8.73 The extent of residual impacts will be highly dependent on the final detail of the built development, particularly its height, and the planting. The treatment of planting - placement, species and density as well as maintenance and long term management - is most critical along the northern boundary with Salt Way, the footpath on the western boundary and around the proposed Bloxham Way roundabout. This is because these are the areas where intervisibility between the development and receptors, sensitivity in the case of footpaths and large numbers on Bloxham Road, is most marked and will cause the greatest adverse landscape and visual impact that could be satisfactorily mitigated. If appropriate planting is undertaken that effectively blocks or substantially reduces views of the built structures, then long term residual landscape and visual impacts could be reduced to moderate - slight adverse for views from the west adjacent to Bloxham Road and to the north adjacent to Salt Way.

B.8.74 If site wide mitigatory planting is carried out, the impact on views from footpaths south east of Crouch Hill could reduce to moderate adverse by the development being satisfactorily assimilated into the wider landscape context. Screening views from here would be both physically difficult – for vegetation to attain sufficient height - and unacceptable, as there is potential to block the long distance view.

B.8.75 Any residual impacts are likely to reduce over time, as vegetation matures and the development 'beds in' and receptors' sensitivities to adverse visual impacts and the presence of large development generally reduces.

B.8.76 Changes to views from Crouch Cottages are likely to be severe adverse during construction and operation. This is likely to reduce to substantial adverse long term, when potential planting has matured, but the roundabout and site access roads will remain highly visible. Although neighbouring the main A361 Bloxham Road, traffic movements will substantially increase during construction and operation.

B.8.77 Whether or not diversions are made, views from footpaths crossing the site will be permanently severely adversely impacted during construction and operation.

Cumulative Impact

B.8.78 Descriptions of developments in the area with potential to cause cumulative impacts are included in Section A2 of this ES. The sites considered were:

- Land South of the Salt Way at Crouch Farm, Bloxham Road (known as the Horgan Land) and
- Longford Park.

B.8.79 In order to cause a cumulative impact, the character of the receiving landscape resource/setting would need to be altered as a consequence of the potential combined impacts of multiple developments. Where views of the site will noticeably be seen in conjunction with some or all of the developments with potential for cumulative impact, they have been included in Table B8.5 and if cumulative impacts occur, they have been identified.

B.8.80 Any impacts caused by this development are unlikely to alter the category of those caused by the Horgan land development. The development of the Horgan land has

the potential to adversely impact on views from Bloxham Road, Salt Way and Crouch Hill.

B.8.81 It is thought there will be no intervisibility between the site and Longford Park.

B.8.82 It has been assumed that developments will well and appropriately designed and detailed, with well considered spaces including retention of internal and boundary vegetation, significant internal structure planting, with low density and heavily and appropriately planted development fronting rural boundaries.

Mitigation

B.8.83 Mitigation measures could include:

- Keeping groundworks to a minimum by locating large footprint landuses on the most level areas and so retain the site's essential topography;
- Siting high density, more urban and active type developments away from Salt Way and, in order to protect farm settings, the southern boundary;
- Retaining and strengthening all internal hedges, using existing gaps for access where possible, retaining all boundary vegetation and strengthening that to the east and west;
- Maintaining an open space buffer to the south of Salt Way;
- Providing a landscape corridor for the footpath on the western boundary;
- Undertaking significant site wide tree and shrub planting including small woodland blocks, to break up the development mass and help assimilation with the wider landscape;
- Undertaking significant planting around the Bloxham Road roundabout;
- Protecting and reinforcing existing links to Salt Way and providing a network of links throughout the development;
- use of appropriate materials, colours and architectural articulation, to break up overall size and shape, avoiding uniform colours and extensive unbroken elevations and roof lines; and
- limiting unnecessary commercial and highway lighting.

Conclusions

B.8.84 A landscape and visual impact assessment has been carried out, following current recommendations and guidance set out in the GLVIA, Second Edition, for a mixed use development on green field land south of Banbury.

B.8.85 The landscape value of the application site as a whole is considered to be:

- Landscape Sensitivity - Low/moderate overall, but increasing to high to the east towards Bodicote;
- Visual Sensitivity - Moderate with impacts primarily on users of Salt Way;
- Overall Sensitivity - Moderate apart from around Wykham Park, Wykham Farm (both listed) and the edge of Bodicote which are high;
- Value - Low, apart from farm settings and paths which are high.

B.8.86 It has been assumed that the development will be well and appropriately designed and detailed, topography will be altered as little as possible, the majority of the site's existing vegetation will be retained and strengthened, and include significant internal and peripheral tree planting including buffer corridors to boundary footpaths and low density and heavily planted development fronting rural boundaries.

B.8.87 With regard to significance, the development will cause a **slight adverse** landscape impact. This is because the proposals, although developing a previously undeveloped site, will retain the site's essential topography and the majority of its vegetation.

B.8.88 The site is generally discreet in the wider landscape, with significant views of the site restricted to close receptors. The main impacts on views will be from Salt Way, Crouch Hill, site footpaths and Bloxham Road, where impacts will vary between moderate and severe adverse. The adverse impact on views could be reduced to neutral as planting matures, but visual impacts will remain severe, because the changes are so dramatic.

B.9 ARCHAEOLOGY AND CULTURAL HERITAGE

Introduction

B.9.1 This section of the Environmental Statement (ES) has been prepared by Wardell Armstong LLP and sets out the archaeological and historical background of the area and provides an evaluation of the significance of the heritage assets within the site boundary. Potential impacts through development to identified heritage assets are established, their significance assessed and appropriate mitigation measures for reducing these potential impacts are proposed where relevant.

B.9.2 In order to inform this assessment baseline data was obtained from the following:

- Oxfordshire Historic Environment Record (HER) consulted August 2012
- Oxfordshire History Centre
- In house datasets of designations (English Heritage 2012):
    - Scheduled Monuments
    - Listed Buildings
    - Registered Parks and Gardens
    - Registered Battlefields
- The National Heritage List for England (English Heritage website)

B.9.3 In addition, a walkover survey of the site was undertaken in October 2012.

Definitions of Terms

B.9.4 For the purposes of this section, the term ‘site’ is used to refer to the application area. The term ‘search area’ relates to the wider area defined for the purposes of baseline information collection.

National and local planning policy and guidance

B.9.5 Statutory designations comprise scheduled monuments, protected wrecks, listed buildings and conservation areas. In addition to the national and local planning policy, presented below, the Ancient Monuments and Archaeological Areas Act (1979) provides protection for scheduled monuments. Likewise, applications affecting listed buildings and conservation areas are considered in respect to the Town and Country Planning (Listed Building and Conservation Areas) Act (1990).

B.9.6 Non-statutory designations, comprising registered parks and gardens and registered battlefields, are assessed under national and local planning policy only. This is also the case for the remainder of the archaeological resource. These are non- statutory designations and comprise entries onto a Historic Environment or Sites and Monument Record as well as previously unknown features which may be recorded as part of a desk based assessment or environmental impact assessment.

National Policy

B.9.7 The National Planning Policy Framework (NPPF) defines the role of the planning system as to promote and achieve sustainable development and involves 'seeking positive improvements in the quality of the built, natural and historic environment' (Department for Communities and Local Government 2012 paragraph 9).

B.9.8 Under the NPPF Plan making and decision taking is informed by 12 core planning principles including the requirement for the planning system to conserve heritage assets in a manner appropriate to their significance, so they can be enjoyed for their contribution to the quality of life for this and future generations (Department for Communities and Local Government 2012 paragraph 17).

B.9.9 Where heritage assets are to be affected by development, local authorities should require the applicant to describe the significance of the assets affected (including the contribution made to the significance of the asset by its setting); the level of detail being proportionate to the asset's importance and which may include a field evaluation.

B.9.10 In determining applications, the NPPF stipulates that 'great weight' should be given to the assets conservation and that substantial harm to or loss of a Grade II listed Building should be exceptional whilst substantial harm to or loss of assets of highest significance most notably Scheduled Monuments, protected wrecks, battlefields and Grade I and II* Parks and Gardens should be wholly exceptional (Department for Communities and Local Government 2012 paragraph 132).

B.9.11 Developments where substantial harm to or total loss of significance of a heritage asset should be assessed against specific tests and should deliver substantial public benefits which outweigh any loss or harm (133). Less than substantial harm to a designated asset require public benefits including the securement of an optimum

viable use (134). Impacts to the significance of non-designated assets will require a balanced judgement based on the level of significance and the scale of harm (Department for Communities and Local Government 2012 paragraph 135), although non-designated assets which are of equivalent significance to designated assets will be considered as such (139).

B.9.12 The NPPF also requires developers to 'record and advance understanding of the significance of any heritage assets to be lost' through archaeological excavations and reporting (Department for Communities and Local Government 2012 paragraph 141).

Local Policy

B.9.13 Local plan policy defers to national guidance in the case of archaeology and cultural heritage.

Baseline Information

Geology and Topography of site

B.9.14 The 50 hectare site, located within arable land predominantly in the Parish of Banbury, is located on the outskirts of the town of Banbury (NGR SP 448 387). The site comprises six parcels of arable land, the eastern most of which is located within the Parish of Adderbury. A green lane, the Salt Way, bounds much of the site to the north and Bloxham Road is present to the west. To the east and south pasture/arable fields bound the site.

B.9.15 The underlying geology of the site is composed of limestone, mudstone and ironstone. No superficial geology is apparent.

Archaeological Background

B.9.16 The Oxford Historic Environment Record was consulted for entries within the search area (taken as an area of approximately 1km radius from the site boundary). Besides identifying heritage assets that may be directly or indirectly affected by the proposed development this search boundary was expected to provide sufficient data to represent the archaeological character of the area. Information on designated heritage assets was complimented by Wardell Armstrong's in-house databases (English Heritage 2012).

B.9.17 From these consultations it was established that there are 62 heritage assets recorded within the search area, as detailed in Appendix B9.1 and drawing B9.1.

Statutory Designated Heritage Assets

Scheduled Monuments

B.9.18 There are no Scheduled Monuments within the site boundary or within the search area.

Listed Buildings

B.9.19 There are no Listed Buildings within the boundary of the site. However, there are 44 Listed Buildings within the search area. These include the Grade II* Listed Church at Bodicote (reference 1277948) and 43 Grade II Listed Buildings, the majority of which are also located at Bodicote 630-750m south-east of the site boundary. The closest of the Listed Buildings to the site is Wykham Farmhouse which is located 150m south of the site (reference 244513).

Conservation Areas

B.9.20 The site is not located within a Conservation Area. However, the Bodicot Conservation Area is located 550m south-east of the site boundary.

Registered Parks and Gardens

B.9.21 The site is not located within a Registered Park and Garden and there are no Registered Parks and Gardens within the search area.

Non Statutory Designated Heritage Assets

Registered Battlefields

B.9.22 The site is not located within a Registered Battlefield and there are no Registered Battlefields within the search area.

Known Non Designated Heritage Assets

Non-Designated HER Entries

B.9.23 There are no non-designated heritage assets recorded within the boundary of the site. However two HER entries are located in close proximity to the site and may prove to extend to within the site boundary. These comprise the site of an Iron Age settlement (HER reference MOX24118) and a Neolithic causewayed enclosure (HER

reference MOX4460). These and the remaining 15 non-designated HER entries will be discussed below.

Previous Archaeological Work

B.9.24 The stripping of a 20m wide easement for a pipeline which crossed the eastern end of the site was subject to an archaeological watching brief in 2005. Finds from the ploughsoil indicated that the eastern end of the site, at least, was being cultivated during the medieval period, possibly from the thirteenth century onwards. No features were recorded within the site; however 180m south of the site two Neolithic pits were recorded (HER reference MOX12816) (John Moore Heritage Services 2005).

B.9.25 No further archaeological work has been undertaken within the site, however, a 2012 planning application for a proposed development within a field located immediately adjacent to the site boundary required a geophysical survey followed by trial trenching to determine the planning application. The geophysical survey identified a series of enclosures with a centralized circular feature. Outside of the enclosures a possible trackway was identified and a series of pits. This was identified as a possible occupation site. Evidence for the former presence of ridge and furrow was also recorded across the entire field (Bartlett Clark Consultancy 2011).

B.9.26 Subsequent trial trenching identified a small Iron Age farming settlement with a roundhouse, the enclosure of which appeared to extend eastwards beyond the confines of the field and into the boundary of the site which this report assesses. Finds comprised pottery dating as late as the mid first century AD and evidence for nearby metal working was indicated by the find of a piece of slag and hammerscale. The remains of ridge and furrow were also confirmed indicating the presence of the field within a medieval open field system (Cotswold Archaeology 2012).

B.9.27 Fieldwalking undertaken to the south of the site recorded a Roman pottery scatter 750m south of the site boundary.

General Historical Background

Prehistoric (c.8000BC – AD43)

B.9.28 The topography and geology of the area does not appear to have been conducive to early activity dating to the Palaeolithic or Mesolithic periods (Little 2003) and there is

no evidence for Palaeolithic or Mesolithic activity within the boundary of the site. During these early periods activity appears to have been focused on the Thames River gravels located to the south.

B.9.29 In respect of the Neolithic period, a cropmark located 160m south of the site has recently been identified from an aerial photograph as a segment of a Neolithic causewayed enclosure (HER reference MOX4460). In the region these ceremonial monuments are found along the River Thames and its tributaries. The River Cherwell, a major tributary to the Thames, is currently present approximately 2km east of the enclosure.

B.9.30 The enclosures were typically 200-400m in diameter (Wilson 2000). Therefore it is possible that the full extent of the enclosure may have encroached within the boundary of the site. In respect of archaeological remains that could be expected to be present within the causewayed enclosure, excavations at other enclosures have revealed inhumation burials, disarticulated human bone and evidence for the lavish consumption of meat and within the inner ditches deposits of cultural material (Bradley 2010).

B.9.31 Two early Neolithic pits are recorded 180m south of the site, to the west of the enclosure (HER reference MOX12816). Whilst one of the pits contained 174 sherds of early Neolithic pottery and is thought to have been contemporary with the causewayed enclosure, the other pit contained 71 sherds of late Neolithic pottery. These pits were possibly excavated on the abandonment of settlement sites and may indicate the presence of further pits in relation to the repeated habitation of the area over a period of time (Bradley 2012). A findspot for a Neolithic axe is also recorded 940m west of the site boundary (HER reference MOX4264).

B.9.32 The continued use of the landscape throughout the remainder of the prehistoric period is attested to by two Bronze Age (2350 BC – 600 BC) round barrows which are recorded 200m south of the site (HER reference MOX12183). Activity dated to the end of the period, the Iron Age (600 BC - 50 AD), is represented by an Iron Age roundhouse within an enclosure present immediately adjacent to the site boundary (HER reference MOX24118). This is likely to have related to an Iron Age farming settlement that probably extended to within the boundary of the site

B.9.33 In addition, the Salt Way, a trackway which bounds the site the north, may reflect a routeway which was in use as early as the prehistoric period (Little 2003).

Romano British (AD43 to 410AD)

B.9.34 Wykham Lane, located to the south of the site is thought to have been in use by the Roman period (Little 2003) and evidence for Roman occupation to the immediate south of the Lane was recorded in the mid nineteenth century. This comprises a possible villa site, 550m south of the site, which was evidenced by tesserae, walls and a stone built oven or kiln along with human remains, animal bone, pottery and coins (HER reference MOX4267).

Anglo Saxon (c.410 to 1066AD)

B.9.35 Whilst there is no evidence for Anglo Saxon activity within the boundary of the site settlement at Banbury, possibly incorporating a Saxon minster, is thought to have originated in the Late Saxon period (Little 2003). This was probably a defended enclosure on a knoll of well drained gravel located approximately 2km north-east of the site.

B.9.36 In closer vicinity to the site, 660m south-east, Late Anglo Saxon pottery has been retrieved from the Bodicote area (HER reference MOX4444).

Medieval (c.1066 to 1540AD)

B.9.37 In 1086 settlement at Banbury, to the north of the site, was verified by its inclusion in the Domesday Book. It was recorded as being within the Banbury Hundred held by the Bishop of Lincoln. At the time of Domesday Banbury was an agricultural village. It was only after construction in 1135 AD of a timber built castle, on the earlier site of the defended Saxon enclosure, that a town developed circa 2km north-east of the site (Potts 1958 and Little 2003).

B.9.38 Outside of the town walls, the hamlets remained. These included Wykham which had been given a separate entry in the Domesday Book due to its status as a sub-manor which was not taxed, paying tithes as it did to Eynsham Abbey. It was held by Robert one of the Bishop of Lincoln's knights and included a mill which was present c.1km south-west of the site. The Christian name, Robert, was perpetuated by following generations of the family, thus the name Robert appears in conjunction

with the Wykham Manor up until 1322 at which point the Manor was removed from the family and granted by Edward II to Sir Robert de Arden (Potts 1958).

B.9.39 In 1330 it is known that a substantial residence was present at Wykham when it was recorded that a licence had been obtained by Sir Robert de Arden to fortify his manor with a wall. This was located 560m south of the site (HER reference MOX4310). An associated medieval village is thought to have been located to the south of the manor-house, 670m south of the site (HER reference MOX4265). It is likely that the land within the site boundary was located within the village's open-field system. No upstanding remains of the medieval manor-house or village remain.

B.9.40 In 1346 it was recorded that Wykham had been returned to a Robert Wykham however this was short-lived as in 1428 the heir of Sir Richard Archer, probably his daughter (the wife of Sir John Dynham), was recorded as holding land which had formerly belonged to Robert Wykham (Potts 1958). Indeed Sir John Dynham was recorded as tenanting the manor-house in 1441 (Crossley 1972). Subsequently in 1501 the Wykham Manor was divided but in 1601 it was re-formed under Thomas Chamberlayne, a judge (Crossley 1972). The earliest surviving buildings at the manor-house date to this time (Listed Building references 1283504 and 1046181).

B.9.41 It should also be noted that if it was not in use prior to this period, the Salt Way which bounds the site to the north was probably in use by the medieval period as part of a wider routeway transporting salt from Droitwich to London.

Post medieval and Modern (c.1540 to 1901)

B.9.42 At some point during the early part of this period, before 1688, a park was created at Wykham manor-house by the Chamberlayne Family (HER reference MOX4308).

B.9.43 By the start of the nineteenth century, after numerous family inheritances, Wykham Manor was sold and split into two. In respect of the land within the site boundary the land within the eastern half of the site was sold to Samuel Gist who also purchased Wykham Farm (Listed Building reference 1046877) located by this time to the immediate south of the eastern part of the site. The manor-house (Listed Building references 1283504 and 1046181) and the land within the western half of the site boundary was sold to James King and later to Captain Daniel Webb (Crossley

1972). During this time the manor-house was extended/rebuilt (Listed Building references 1283504 and 1046181 and now 1391357).

B.9.44 As expected therefore, the earliest cartographic evidence studied as part of this assessment, the 1852 Wickham Tithe Map (see Figure B9.2), showed the land within the site boundary as being owned by Daniel Webb and Samuel Gist. Daniel Webb who owned the manor-house (Listed Building references 1283504 and 1046181 and 1391357) owned plots 72, 73 and 87. Samuel Gist who owned Wykham Farm (Listed Building reference 1046877) owned plots 69, 70, 71 and 88. The names of three of the plots, 'Roberts Road Ground' (plot 88), 'Robert's Middle Ground' (plot 70) and 'Roberts Ground' (plot 71) possibly refer to the ownership of the land during the medieval period by Robert of Wykham.

B.9.45 In respect of the land-holding associated with the manor-house at the time of the production of the Tithe, the associated land within the boundary of the site (plots 72, 73 and 87) were under an arable regime. The manor-house's parkland, i.e. its designed setting, was away from the site, south of Wykham Lane (plots 9, 14 and 23).

B.9.46 However by the time of the production of the 1882 Ordnance Survey map, see Figure B9.3, a parcel of land to the north of Wykham Lane, which borders the south-west corner of the site, had become incorporated into the parkland. This appears to have been so that the manor-house could be accessed by a new driveway. By 1923 this new driveway had been slightly altered and a lodge house constructed to the immediate west of the site. The current course of the driveway and the lodge house form the main entrance to the manor-house as it stands today; a school which opened in 1969.

B.9.47 In respect of the land within the site boundary historic Ordnance Survey maps show that, whilst most of the boundaries depicted in 1852 remain, three of the boundaries shown in the centre of the site in 1852 have been removed. This was undertaken in the 1980s-90s probably to create one large field more suited to modern agricultural methods.

Site Visit

B.9.48 A walkover survey of the site was undertaken on the 5th October 2013.

B.9.49 The site was inspected to:

- establish the presence of above ground archaeology, whether or not previously recorded;
- assess and validate data collected as part of the desk-based assessment;
- assess the topography of the site; and
- to assess inter-visibility with heritage designations.

B.9.50 The site was observed as comprising six parcels of arable land the majority of which had been recently harvested and re-sown. Field boundaries comprised hedgerows and/or mature trees which in places were accompanied by ditches. Of note was the northern boundary of the site where it lay parallel and adjacent to the Salt Way. This incorporated a line of mature trees/hedgerows on a slight bank, to the north of which (outside of the site boundary) was a ditch which formed the southern boundary of the Salt Way, see Plate 1.

Plate 1: Ditch to south of the Salt Way (looking west – site on the LHS of the photo) (ranging pole – 1m)

B.9.51 A similarly substantial ditch on a north-south alignment was present within the site boundary separating the eastern-most field from the remainder of the site, see Plate 2. This followed the line of the Parish Boundary between Banbury and Adderbury and was lined on either side by narrow trackways.

Plate 2: Ditch corresponding with the Parish boundary between Banbury and Adderbury (ranging pole – 1m)

B.9.52 No other features of archaeological or heritage significance were observed within the boundary of the site. The area of the site immediately adjacent to the Iron Age farming settlement which is likely to have extended within the boundary of the site was featureless, see Plate 3.

Plate 3: Area of site likely to have been the location of an Iron Age farming settlement associated with HER reference MOX24118)

B.9.53 In respect of inter-visibility with heritage designations views towards the Listed Buildings and the Conservation Area within the search area were blocked/substantially screened from the majority of the site. The exceptions to this were the western-most field within the site and the eastern-most field within the site. With regard to the western-most field, the field was visible from the driveway to Wykham Park which may be of relevance when considering setting impacts to some of the listed buildings at Wykham Park (Listed Building references 1283504 and 1046181), see Plate 4. The eastern-most field was potentially inter-visible with the western boundary of the Bodicote Conservation Area and the Listed Buildings on its perimeter.

Plate 4: View towards the site from the driveway to Wykham Park (site comprises recently ploughed land – brown field)

Geophysical Survey

B.9.54 At the discretion of the Client a geophysical survey has been undertaken within the site boundary. This was undertaken by Wardell Armstrong Archaeology during October 2012.

B.9.55 The objective of the geophysical survey was to determine the presence/absence, nature and extent of any potential archaeological features within the site boundary. The aim was for results of the survey to be used to inform upon the need for further archaeological investigation should the potential for significant archaeological remains be identified.

B.9.56 The full geophysical report is appended to this report, see Appendix B9.2. In summary the survey record potential archaeological remains within all of the fields within the site boundary. These were concentrated, however in the eastern-most and western-most fields and along the northern boundary of the large central field.

Summary of Baseline

B.9.57 Consultation undertaken with the Oxfordshire Historic Environment Record and the review of information from English Heritage data sets has established that there are no designated heritage assets within the boundary of the site. However 44 Listed Buildings and one Conservation Area are present within the search area. The settings of designated heritage assets are a material consideration.

B.9.58 With regards to potential buried remains the site of an Iron Age farming settlement which has been proven by trial trenching to be present to the west of the site is likely to have once extended to within the boundary of the site (HER reference MOX24118). Indeed, a geophysical survey undertaken as part of this present assessment has recorded the associated eastern enclosure boundary within the site boundary along with further anomalies within the northern boundary of the site which possibly relate to contemporary Iron Age settlements. Other anomalies within the site boundary may represent associated field boundaries or enclosures, in particular a possible droveway was recorded in the western half of the site. In addition, a Neolithic causewayed enclosure, recorded 160m south of the site (HER reference MOX4460) may have extended within the boundary of the site or had associated features within the boundary of the site. The geophysical survey undertaken as part of this assessment records a number of anomalies in the eastern two fields of the site which may have been associated within Neolithic activity, including a possible routeway.

B.9.59 In respect of later periods, the presence of Wykham Lane to the south which was a Roman routeway and the Salt Way to the north which may have been utilised during the Roman period, means that Roman activity cannot be ruled out. By the medieval period, however, the land within the site is likely to have been within an open field system away from the main area of settlement in the locality which is likely to have been located in the area of Wykham Park approximately 670m south of the site (HER reference MOX4265). Indeed the geophysical survey undertaken as part of this

assessment recorded ridge and furrow remains of an open field system which possibly dates to the medieval period.

Identification and Assessment of Impacts

B.9.60 Using the criteria set out in Appendix B9.2 the following impacts, their magnitude and their significance are predicted. These are split into construction and operation impacts which are described under 'direct' and 'indirect' in Appendix B9.3.

Direct Impacts

B.9.61 Ground disturbance will have the potential to disturb buried archaeological remains. The significance of this impact is presented below.

Table B9.1 - Potential Construction Impacts

Receptor	Interest and Significance of Interest	Magnitude of Impact	Significance of Impact
Physical impact to known and potential heritage assets			
The parish boundary between Banbury and Adderbury present along the western boundary of the eastern most land parcel within the site (no reference)	Historic: medium	Whilst the majority of the parish boundary present within the site will be retained it is proposed that part of it will be breached. This would be to allow road access into the eastern-most land parcel within the site boundary. Whilst this will cause an impact of major magnitude to the breached section, the magnitude of impact to the boundary when seen as a whole will be minimal. Magnitude of impact = negligible to low	Up to slight adverse
Geophysical anomalies in the two eastern-most fields which may be indicative of archaeological remains potentially associated with the Neolithic enclosure to the south of the site	Archaeological: most likely medium to high importance	Development proposals in the two eastern-most fields comprise, in the first instance, the deposition of an agreed and appropriate depth of top soil. Due to the depth of the topsoil and the nature of the development in this part of the site, which would comprise open space, it is anticipated that there would be no ground disturbance to buried archaeological features i.e. it is	Neutral

Receptor	Interest and Significance of Interest	Magnitude of Impact	Significance of Impact
		expected that any ground disturbance will impact topsoil layers only, not subsoil. Magnitude of impact = no impact	
Geophysical anomalies indicative of Iron Age enclosures and associated field boundaries in the western and central areas of the site	Archaeological: most likely medium	Proposed development will cause the removal and/or truncation of remains. Magnitude of impact = up to major	Most likely moderate adverse
Geophysical anomalies indicative of medieval ridge and furrow	Archaeological: low to medium	Proposed development will cause the removal and/or truncation of remains. Magnitude of impact = up to major	Up to moderate adverse
Physical impact to as yet unknown heritage assets			
Other currently unknown buried remains within the two eastern-most fields within the site boundary (not detected by geophysical survey)	Archaeological: most likely medium to high importance	Development proposals in the two eastern-most fields comprise, in the first instance, the deposition of an agreed and appropriate depth of top soil. Due to the depth of the topsoil and the nature of the development in this part of the site, which would comprise open space, it is anticipated that there would be no ground disturbance to buried archaeological features i.e. it is expected that any ground disturbance will impact topsoil layers only, not subsoil. Magnitude of impact = no impact	Neutral
Other currently unknown buried remains within the western and central parts of the site	Archaeological: most likely up to medium	Proposed development will cause the removal and/or truncation of remains. Magnitude of impact = up to major	Most likely moderate adverse

Receptor	Interest and Significance of Interest	Magnitude of Impact	Significance of Impact
boundary (not detected by geophysical survey)			

In-Direct Impacts

B.9.62 There is a potential that the setting of designated heritage assets within the vicinity will be impacted upon. These potential impacts and how they may infringe on the significance of the heritage designations are discussed in Table B9.2 below. In addition to designated heritage assets the non-designated Salt Way is also discussed below.

Table B9.2 - Potential Operational Impacts

Receptor	Interest and Significance of Interest	Magnitude of Impact	Significance of Impact
Impact to Grade II* Listed Buildings			
St John the Baptist Church (reference 1277948)	Architectural and/or historic: high	The setting of the church, located 840m south-east of the site comprises its churchyard and its physical position within the village of Bodicote. The proposed development will not infringe on this or affect the churches prominence as a focal building. Furthermore due to the presence of intervening vegetation the church will only be inter-visible with the eastern-most field within the site. This will comprise partial screened inter-visibility against a backdrop of the urban edge of Banbury. There will therefore be no impact to setting elements that contribute to the significance of the building. Magnitude of impact = no impact	Neutral
Impact to Grade II Listed Buildings			
Wykham Farmhouse (reference 1046877)	Architectural and/or historic: medium	Whilst the farmhouse is located 150m south of the proposed development inter-visibility is substantially screened by vegetation (mature hedgerows and trees). The retention of intervening mature trees and hedgerows will therefore screen the development from view. However, although the land within the site boundary is now farmed by another farm (Wykham Park Farm) and is therefore outside of the control of Wykham Farm in terms of design and function, some of the land within the	Slight to moderate adverse

Receptor	Interest and Significance of Interest	Magnitude of Impact	Significance of Impact
Wykham Farmhouse (reference 1046877) (cont)		site was historically (from at least 1852) associated with Wykham Farm (plots 69, 70, 71 and 88 on Figure B9.3). Therefore part of the site is part of the farm's historic contextual setting. It does not, however, constitute the entirety of the farmhouse's historic contextual setting which included as it did other areas of farmland and in the immediate vicinity of the farmhouse a yard with associated buildings. Magnitude of impact = up to medium	
Listed building ranges at Wykham Park school (references 1283504 and 1391357)	Architectural and/or historic: medium	From observations on site and from the exterior of the buildings, the listed buildings, located 520-560m south of the site, are not thought to be inter-visible with the land within the site boundary. This is due to an area of intervening woodland located to the immediate east and north-east of the buildings, topography and the presence of a mature hedgerow/plantation belt that bounds the site to the south. However the site, in-particular the western-most field within the site boundary, is visible from the main driveway to the buildings. Due to the fact that the buildings represent a former country residence/manor-house the approach to the buildings was historically important in terms of a visitor's perception of the importance of the residence. This driveway was created between 1852 and 1885-7 and extended to be located within the immediate vicinity of the site's western boundary at some point between 1885-7 and 1923. On entry to this driveway, through wrought iron gates and past a lodge house, the visitor travels through parkland which had been established from former arable land between 1852 and 1885-7. To the east of the parkland an area of arable land placed and still does place the parkland within a wider rural	Slight to moderate adverse

Receptor	Interest and Significance of Interest	Magnitude of Impact	Significance of Impact
		setting. The proposed development will encroach on this historic and current arable setting and will therefore infringe on the visitors perception of the buildings. However the parkland itself will not be physically impacted upon and the arable backdrop will not be entirely eliminated. Magnitude of impact = up to medium	
Gateways, walls and gatepiers (reference 1046181)	Architectural and/or historic: medium	The setting of these gateways, walls and gate piers are restricted visually and contextually to their association with Wykham Park. An appreciation of this association and the function of the buildings will not be impacted upon by the proposals. Magnitude of impact = no impact	Neutral
Wykham Mill Farmhouse (reference 1046182)	Architectural and/or historic: medium	The proposed development which is located 900m to the north-east is not visible from the farmhouse due to topography and intervening mature trees/hedgerows. In addition the physical nature of the farmhouse's own land, over which it holds rights of function and design, will not be impacted upon by the proposals. There will be no impact to factors that contribute to the building's significance. Magnitude of impact = no impact	Neutral
Barn attached to Wykham mill farmhouse (reference 1199223)	Architectural and/or historic: medium	The setting of the barn is limited primarily to its association with Wykham Mill Farmhouse. This will not be impacted upon. The functional and utilitarian nature of the building does not afford a contextual appreciation of its setting beyond that of its relationship to Wykham Mill Farmhouse and its immediate surrounds. Besides due to topography and intervening mature trees/hedgerows the barn and the site are not inter-visible. Magnitude of impact = no impact	Neutral
Crouch Farmhouse (reference 1199211)	Architectural and/or historic: medium	Intervening mature hedgerows and trees screen the proposed development, located 550m east, from view. In addition the physical nature of the farmhouse's own land, over which it holds rights of function and design, will not be impacted upon by	Neutral

Receptor	Interest and Significance of Interest	Magnitude of Impact	Significance of Impact
		the proposals. There will be no impact to factors that contribute to the building's significance. Magnitude of impact = no impact	
Horton General Hospital (reference 1200199)	Architectural and/or historic: medium	The building is located within the urban area of Banbury and has no views or contextual links with the land within the site boundary. Magnitude of impact = no impact	Neutral
Headstones within the churchyard of St John the Baptist Church (references 1248399, 1248400, 1248401 and 1248674)	Architectural and/or historic: medium	The visual and contextual setting of the headstones comprises their physical relationship with the Church of St John the Baptist, the churchyard and the rest of the churchyard furniture (other headstones ets). The proposals will not physically infringe on these relationships or affect how the headstones are appreciated and understood. Magnitude of change – no impact	Neutral
Bodicote House (reference 1248703)	Architectural and/or historic: medium	The house, located 750m east of the site, is not inter-visible with the majority of the site due to intervening buildings along White Post Road and intervening vegetation (mature trees within the Recreation Ground and a plantation strip along the western boundary of the eastern-most field within the site). Therefore only the eastern-most field within the site will potentially be visible from the building, although this will be screened by vegetation and limited to upper floors of the building if at all. The setting of the building within its own grounds on the outskirts of Bodicote will not be infringed upon. There will be no impact to any setting elements that contribute to the significance of the building. Magnitude of impact = no impact	Neutral
Lodge to	Architectural	The setting of the lodge is restricted visually and	Neutral

Receptor	Interest and Significance of Interest	Magnitude of Impact	Significance of Impact
Bodicote House	and/or historic: medium	contextually to its association with Bodicote Hall. An appreciation of this association and the function of the lodge house will not be impacted upon by the proposals. Magnitude of impact = no impact	
Other buildings on the extreme western fringe of Bodicote: Old Barn House (reference 1248679); Town Furlong Farmhouse (reference 1248702) and Old Barn Cottage 1277817)	Architectural and/or historic: medium	The primary setting of the buildings located 735-780m south-east of the site, is their physical location on the edge of the Conservation Area of Bodicote. This will not be impacted upon as the proposed development will not isolate the buildings from the rest of the Conservation Area or impact on the Conservation Areas physical form i.e. the proposed development will not envelop the Conservation Area. In terms of views, there are no views out of the Conservation Area from the lane on which the buildings are located (Goose Lane). In terms of views from the rear of the properties views towards the whole site, except the eastern-most field, are prevented by the presence of intervening hedgerows/mature tree belts. Only views of the eastern-most field may be possible but these will be screened by intervening mature trees and on the other side of intervening agricultural land. There will be no impact to any setting elements that contribute to the significance of the buildings. Magnitude of impact = no impact	Neutral
Other Grade II Listed Buildings within Bodicote (References 1248370,	Architectural and/or historic: medium	The primary setting of the buildings located at least 600m south-east of the site, is their physical location within the Conservation Area of Bodicote. This will not be impacted upon as the proposed	Neutral

Receptor	Interest and Significance of Interest	Magnitude of Impact	Significance of Impact
1248383, 1248384, 1248385, 1248386, 1248677, 1248678 1248705, 1248707, 1248721-23, 1248732-5, 1248740-1, 1277760, 1277764-5, 1277795-6, 1277815, 1277816 and 1277943)		development will not isolate the buildings from the rest of the Conservation Area or impact on the Conservation Areas physical form i.e. the proposed development will not envelop the Conservation Area. Neither will any of the properties be inter-visible with the land within the site boundary. There will be no impact to any setting elements that contribute to the significance of the buildings. Magnitude of impact = no impact	
Conservation Areas			
Bodicote	Architectural and/or historic: medium	The proposed development will not physically impact on the Conservation Area either through physical changes within its boundaries or through physical changes to the nature of its boundaries i.e. the proposed development is located 550m west of the Conservation Area. Whilst this distance obviously negates any physical impact to the land within the Conservation Area it means that the currently rural fringes to the Conservation Area will not be enveloped by modern development. In addition the Conservation Area itself is predominantly enclosed in nature with no significant outward views towards the surrounding countryside and the site. There will be no impact to any setting elements that contribute to the significance of the Conservation Area. Magnitude of impact = no impact	Neutral
Non-Designated Heritage Assets			
The Salt Way (no reference)	Archaeological/historic: up to medium	The setting of the part of the Salt Way that bounds the site to the north does by definition include the land within the site boundary. However, this heritage asset is a functional feature used for the purpose, as far as we know, of transporting salt from Droitwich to London. There is no evidence to suggest that views to the south were part of the	Neutral

Receptor	Interest and Significance of Interest	Magnitude of Impact	Significance of Impact
		trackway's intended design, or therefore part of its setting to an extent that would contribute towards its significance in heritage terms. Any views would have been and continue to be accidental. The trackway would have been of a functional nature: it was not a route designed for enjoyment of for the manipulation of travellers perceptions. Furthermore, as an aside, it should be noted that the presence of mature trees along the entire southern side of the trackway enclose the trackway and go some way to isolate it from the land within the site boundary which is screened from view. Magnitude of impact = no impact	

Summary of Impacts

B.9.63 The proposed development has the potential to physically impact upon the parish boundary between Banbury and Adderbury. If realised, this impact will be of up to slight adverse significance. The proposed development also has the potential to impact upon archaeological remains identified by geophysical survey and other as yet unrecorded buried remains within the central and western parts of the site. This impact, if realised, is likely to be of up to moderate adverse significance. In respect of heritage designations the proposed development has the potential to impact upon the setting of three Grade II Listed Buildings. The setting impacts in all cases will be of slight to moderate adverse significance.

Mitigation

B.9.64 As a consequence of the archaeological potential of the site a geophysical survey was undertaken within the boundary of the site during October 2012. This is attached to this report, see Appendix 2. This identified a number of anomalies across the site. As stated above, the anomalies most likely to be associated with Neolithic activity were confined to the two eastern-most fields and as a result of this the development proposals have been tailored to allow preservation in situ of archaeological remains in the two eastern-most fields within the site boundary.

B.9.65 Within the remainder of the site there is no evidence to suggest the presence of remains of greater than medium importance. Therefore it is considered that the

potential adverse impacts to buried archaeological remains within the central and western parts of the site could adequately be mitigated through a programme of archaeological fieldwork carried out as a condition to planning consent.

Conclusions

B.9.66 Baseline information was gathered from the Historic Environment Record held by oxford County Council, the Oxfordshire History Centre and English Heritage data sets.

B.9.67 It has been established that no statutory designations will be physically impacted upon by the proposals. However three Grade II Listed Buildings may experience setting impacts of slight to moderate adverse significance. These comprise Wykham Farmhouse (reference 1046877), and building ranges at Wykham Park (references 1283504 and 1391357).

B.9.68 In respect of buried archaeological remains it has been established that a potential exists for buried archaeological remains, in-particular prehistoric remains dating to the Iron Age and Neolithic periods, although remains dating to other periods cannot be ruled out.

B.9.69 As a consequence of the archaeological potential of the site a geophysical survey has been undertaken by Wardell Armstrong Archaeology and will be submitted as part of the planning application which this report supports. The results of the geophysical survey will, in consultation with the Development Control Archaeologist, inform on the necessity of further archaeological fieldwork. It is considered that this could be carried out as a condition to planning consent.

Bibliography

Cartographic Sources

- Wykham Tithe Map: 1852
- Ordnance Survey Maps: 1882, 1885-7, 1900, 1923, 1938, 1955, 1983, 1992-3, 2006, 2012

Bibliographic Sources

- Communities and Local Government. 2012. *National planning policy framework*
- Bartlett Clark Consultancy. 2011. *Land east of Bloxham Road, Banbury report on archaeological geophysical survey*

- Bradley, R. 2010. *Solent Thames research framework resource assessment the Neolithic and Early Bronze Age*
- Cotswolds Archaeology. 2012. *Land east of Bloxham road Banbury archaeological evaluation*
- Crossley, A. Ed., 1972. *A history of the County of Oxford: volume 10: Banbury Hundred*
- John Moore Heritage Services. 2005. *An archaeological watching brief on Banbury Booster 876F Oxfordshire*
- Little, B. 2003. *Banbury a history*
- Potts, W. 1958. *A history of Banbury the story of the development of a county town*
- Wilson. D. 2000. *Air photo interpretation for archaeologists*

B.10 WASTE AND RECYCLING

Introduction

B.10.1 This part of the ES has been prepared by Wardell Armstrong LLP and considers the waste management effects associated with the construction and future use of the proposed development. Throughout the development of the site, sustainable waste management and construction methods that demonstrate good practice and legislative compliance will be encouraged.

B.10.2 This chapter should be read in conjunction with Section A of this Environmental Statement (ES), which give details of the site location and development works to be undertaken at the site, respectively.

B.10.3 Waste will arise from the development proposals as a result of construction operations and from occupation of the completed development. Construction operations will generate waste materials as a result of general handling losses and surpluses. These materials could include concrete asphalt, brick, glass, timber and roofing tiles, as well as packaging materials such as plastics and paper. These materials are likely to be disposed of off-site as wastes. Any unused paints, timber treatments etc. may also require off-site disposal. The completed development will generate a mixture of waste streams in accordance with the development i.e. industrial, distribution and storage. Those waste materials which cannot be recycled are likely to require disposal off-site to landfill.

Methodology

B.10.4 This section of the ES considers the potential impacts of the waste likely to arise during construction and from the completed development including the following:

- The types and volumes of waste to be produced by construction and use of the proposed development;
- How waste will be utilised within the proposed development;
- Methods and measures to be employed to reduce the volume of waste requiring final disposal including the potential to recycle;
- The final destination of the residual waste and potential effects on the capacity of existing waste management facilities;
- Cumulative impacts of other proposed developments in the area.

B.10.5 In preparation of this section, reference has been made to the following information sources:

- The Oxfordshire Minerals and Waste Plan (OMWP), July 1996;
- Emerging Minerals and Waste Core Strategy;
- The South East Plan Regional Spatial Strategy (SEPRSS), May 2009;
- Oxfordshire Minerals and Waste Annual Monitoring Report 2011;
- Oxfordshire Waste Partnership Joint Municipal Waste Management Strategy (MWMS), January 2007;
- Cherwell Local Plan (CLP), November 1996;
- Waste Strategy for England 2007;
- Revised Waste Framework Directive 2008;
- Waste (England and Wales) (Amendment) Regulations 2012;
- Environment Agency – Data from Permitted Waste Management Facilities 2011;
- DEFRA 'Waste Data Overview' June 2011[28];
- Government Review of Waste Policy in England, June 2011;
- Building Research Benchmark Data May 2012;
- Planning Policy Statement 10 'Planning for Sustainable Waste Management' (revised March 2011);
- Site Waste Management Plan Regulations 2008;
- BS 5906: 2005 Waste Management in Buildings, Code of Practice;
- Cherwell District Council Planning and Waste Management Design Advice, October 2009; and
- Commercial and Industrial Waste in England – Statement of Aims and Actions 2009.

Waste Policy and Leglisative Framework

National Planning Policy

The National Planning Policy Framework (NPPF)

B.10.6 The NPPF was published in March 2012 and does not contain any specific waste policies. Planning Policy Statement 10 '*Planning for Sustainable Waste*

[28] http://wwwsmartwaste.co.uk/page.jsp?id=37

Management' (revised March 2011) will remain in place until a National Waste Management Plan is published.

Planning Policy Statement 10 'Planning for Sustainable Waste Management' (revised March 2011)

B.10.7 Planning Policy Statement 10 (PPS10) (Revised March 2011) encourages sustainable waste management. Key objectives include encouraging waste to be disposed of as a last resort and to ensure that through planning strategies the design and layout of new developments support sustainable waste management.

B.10.8 The National Planning Policy Framework document which will replace all PPS's will not contain any specific waste policies. Instead PPS10 will remain in place until a National Waste Management Plan is published.

Regional Planning Policy

The South East Plan Regional Spatial Strategy (SEPRSS), May 2009

B.10.9 The South East Plan Regional Spatial Strategy (SEPRSS) currently forms part of the statutory development plan to guide future development across the South East. The plan has adopted an approach which reflects the waste hierarchy and the concept of 'zero waste'. Its long term aspiration is to eliminate waste through changes in product design, behaviour management and changes in the economy.

Local Planning Policy

Oxfordshire Minerals and Waste Plan (OMWP) 1996

B.10.10 The OMWP covers the periods up to 2006 and will be replaced by the new Minerals and Waste Plan that is currently in development. The OMWP presents a core strategy and related policies which will enable waste and recycling targets to be met.

Emerging Minerals and Waste Core Strategy

B.10.11 The plan outlines the need to make provision for waste management facilities to meet the needs of Oxfordshire over the next 20 years. The plan states that waste is increasingly being diverted from landfill by recycling and treatment.

Cherwell Local Plan, November 1996

B.10.12 The CLP states that 'whilst the County Council is the waste disposal authority, this council has some responsibilities with reference to recycling. A Recycling Plan has

been prepared which sets out the authority's targets, including the promotion and expansion of community based recycling centres'.

Legislation

B.10.13 There are many legislative drivers in force to minimise, reduce and divert waste away from landfill including: the Council Directive 99/31/EC on the Landfill of Waste (the Landfill Directive); Council Directive 2008/98/EC on the revised Waste Framework Directive, Waste Electrical and Electronic Equipment (WEEE Directive).

Revised Waste Framework Directive – 2008

B.10.14 As part of the revisions of the Waste Framework Directive (rWFD) it sets out the requirement of the waste hierarchy and includes recycling targetes to be achieved by 2020.

The Waste (England and Wales) (Amendment) Regulations 2012

B.10.15 The EU Waste Framework Directive places a greater emphasis on resource efficiency alongside the protection of the environment and human health as the basis for European waste policy. It includes the waste hierarchy model which prioritises the order of waste management: waste prevention, preparing for re-use, recycling, recovery (including energy recovery) and disposal. Revisions to the Waste Framework Directive have been implemented through the Waste (England and Wales) Regulations 2011 which came into force in March 2011 and amended in 2012.

Site Waste Management Plan Regulations 2008

B.10.16 Under the Site Waste Management Plan (SWMP) Regulations 2008 a SWMP is required to be produced by the client and prior to any commencement of work and passed onto the Appointed Principal Contractor for projects with a construction phase cost greater than £300,000 (excluding VAT).

B.10.17 It is recognised that this the preparation of this plan allows the client, project managers, designers and contractors to consider ways, at an early stage of the project, to minimise waste (through purchasing strategies or methods of work aimed at reducing waste), ways that materials can be re-used or recycled as part of the project.

Statutory Waste Management Targets

Waste Strategy of England - 2007

B.10.18 The "*Waste Strategy for England*" 2007 sets national targets for the way waste is managed and if these are met, it should ensure that England would meet the requirements of the Landfill Directive (the directive aims to reduce biodegradable waste going to landfill).

B.10.19 The Waste Strategy for England 2007 set the following national household waste recycling and composting targets :

- To recycle or compost at least 40% of household waste by 2010;
- To recycle or compost at least 45% of household waste by 2015;
- To recycle or compost at least 50% of household waste by 2020.

B.10.20 In addition, recovery targets were set as:

- To recover at least 53% by 2010;
- To recover at least 67% by 2015;
- To recover at least 75% by 2020.

B.10.21 A national waste policy review was undertaken by the new Coalition Government in late 2010/early 2011. European legislation will continue to be a driving force in English waste policy, and the Government will implement the revised Waste Framework Directive (rWFD).

Oxfordshire Waste Partnership Joint Municipal Waste Management Strategy (MWMS), January 2007

B.10.22 The MWMS for Oxfordshire 2007 sets out plans for dealing with Oxfordshires Municipal waste through to 2030. The following national household waste recycling and composting targets have been set :

- To recycle or compost at least 40% of household waste by 2010;
- To recycle or compost at least 45% of household waste by 2015;
- To recycle or compost at least 55% of household waste by 2020.

B.10.23 The MWMS states "*We will work in partnership to reduce waste and to maximise resuse, recycling and composting. We will treat residual waste before disposal to recover further value and to minimise the environmental impact of disposal*".

Construction Waste Targets

B.10.24 The Waste Data Review 2011 indicates that in 2008, 62% of waste was recycled and 26% was sent to landfill.

B.10.25 The Strategy for Sustainable Construction (2008) in England has a specific target for the construction sector, defined as:

"*By 2012, a 50% reduction in construction, demolition and excavation waste to landfill compared to 2008"*[29].

B.10.26 It is stated in WRAP (Waste & Resources Action Programme) Guidance document 'Guidelines for Measuring and Reporting Construction, Demolition and Excavations Waste' that WRAP developed the 'Construction Commitments: Halving Waste to Landfill' which is a voluntary agreement for the UK construction industry to achieve the target set out in the above paragraph.

B.10.27 Under the revised Waste Framework Directive (November 2008) 70% of all construction and demolition waste must be recycled or recovered by 2023.[30]

Commercial and Industrial Waste in England – Statement of Aims and Actions 2009

B.10.28 Defra's aims for commercial and industrial waste are as follows:

- To reduce the amount of waste arising by more sustainable design, production, purchasing and use as well as reuse of products and materials in the economy;
- To increase the proportion of waste that does arise which is productively re-used, recycled or recovered;
- To reduce significantly the amount of waste that is sent to landfill or

[29] WRAP Guidance Document " *Guidelines for Measuring and Reporting Construction, Demolition and Excavation Waste*". Updated August 2011.
[30] DEFRA: Waste Data Overview, June 2011

incinerated without recovering energy;

- To manage any remaining residual waste responsibly;
- To maximise the investment opportunities for business from commercial and industrial waste.

Guidance Documents

BS5906:2005 – Waste Management in Buildings – Code of Practice

B.10.29 This British Standard sets out a code of practice for the storage, collection and segregation of waste. It states that waste storage areas should be located in an easily accessible and safe area for both waste producers and collectors.

B.10.30 The document indicates that waste management issues can have major impacts in terms of site layout and design of residential and non-residential developments.

Cherwell district council – Planning and Waste Management Design Advice, October 2009

B.10.31 To accord with the design advice development proposals should demonstrate that they will make sufficient provision for sustainable waste management (including storage facilities, facilities for kerbside collection, waste separation and minimisation where appropriate) without adverse impact on the street scene, the local landscape or the amenities of neighbours.

Baseline Conditions

Waste Management Facilities/Capacity

B.10.32 The use of the completed development will generate 'controlled waste' which will need disposal off-site.

B.10.33 Oxfordshire has 6 non-hazardous landfill site. It is recognised that waste management is continually changing and focussing on implementing the model of the waste hierarchy, where disposal at landfill should be viewed as a last resort.

B.10.34 There are also two recycling/transfer facilities, one Household waste recycling centre and one residual waste treatment centre in the area surrounding Wykham Park Farm. The recycling centre strategy includes provision of a new facility to serve Banbury and the surrounding part of the county.

B.10.35 The total waste management capacity in Oxfordshire at March 2011 was:

- 17.4 million tonnes of landfill;
- 2.4 million tonnes per annum of recycling and compost;
- 0.5 million tonnes per annum of recovery treatment.

Waste Arisings

Construction and demolition waste arisings

B.10.36 Construction and demolition (c&d) waste accounted for 35% of the total waste arisings in the UK in 2008. In England in 2008, total construction and demolition waste was estimated at 86.9 million tonnes of which 62% was recycled or recovered and 26% sent to landfill[31].

B.10.37 Based on information recorded in a study Capita Symonds for WRAP "Construction, demolition and excavation, use and disposal in England" in Oxfordshire in 2011, of approximately 650,000 tonnes of C&D waste, 14% was sent to landfill, 61% was recycled and 25% was recovered[32].

Municipal Waste Arisings

B.10.38 The Minerals and Waste Core strategy (MWCS) states that the municipal waste produced in Oxfordshire in 2010/2011 was 0.3 million tonnes. In 2010/2011 Household waste that was recycled or composted rose to 55%, which is an increase of 6.3% compared to 2009/2010 figures. In 2010/2011 the 300,166 tonnes were managed as follows:

Landfill	119,773 tonnes = 46.6%
Composted/Foodwaste	69,302 tonnes = 23.1%
Recycled/Reused	85,785 tonnes = 28.6%
Other	5,087 tonnes = 1.7%

B.10.39 In 2010/11, 53% of municipal waste was diverted from landfill or recovered (either by recycling, composting, or energy recovery). Therefore in 2010/11, Oxfordshire has achieved its 2010 National target of 53% landfill diversion. In 2010/11 51.7% of household waste was recycled or composted and this exceeds the national target of 45% by 2015.

[31] DEFRA: Waste Data Overview, June 2011

[32] Waste Annual Monitoring report, 2011

B.10.40 In 2010/2011 the following National Waste Performance Indicator figures relate to Oxfordshire County Council:

NI 191 = 446 kg of residual household waste per household;

NI 192 = 55% of household waste sent for reuse, recycling or compositing;

NI 193 = 46.6% of municipal waste sent to landfill .

B.10.41 Another important statistic is the average waste produced per person and per household per year. The population of the county is approximately 635,500 with 268,759 households.

B.10.42 Figures for England are as follows:

- Average household waste generated in kg/person/year = 449kg (2010/2011) (of which 185kg was recycled , composted or reused and 264kg was not);
- Average household waste kg/household/year = 1036kg (2009/2010) (of which 411kg was recycled, composted or resused, with 625kg not).

B.10.43 Figures for Oxfordshire County Council (2010/2011) are as follows:

- Average household waste generated in kg/person/year = 437kg (2010/2011) (of which 249kg was recycled , composted or reused and 188kg was not);
- Average household waste kg/household/year = 1033kg (2010/2011) (of which 587kg was recycled, composted or reused, with 446kg not).

Commercial and Industrial Waste (C&I) Arisings

B.10.44 The survey of C&I waste arising's in 2010 (published by DEFRA in June 2011) indicates that approximately 47 million tonnes of C&I waste was produced in England during 2009, a reduction of 29% since the last survey conducted in 2002/2003. 52% of C&I waste was recycled and 24% landfilled in 2009.

B.10.45 The Oxfordshire Minerals and Waste Annual Monitoring Report (AMR), 2011 has made estimates based on information from the Environment Agency that total amount of C&I waste arising's in 2010/11 were 566,800. 50% of this was sent to landfill, 49% recycled or composted and 1% recovered.

Hazardous Waste Arisings

B.10.46 Hazardous wastes include substances such as pesticides, asbestos, mobile phone batteries, used engine oils,redundant refrigerators and scrap cars (End of Life Vehicles) and some waste electrical equipment.

B.10.47 According to the Minerals and Waste Core Strategy, the total amount of hazardous waste arising in Oxfordshire in 2010 was approximately 40,000 tonnes and is expected to rise to 60,000 by 2030. The AMR states that much of Oxfordshire's Hazardous waste is exported due to the limited number of treatment and disposal sites for hazardous waste.

Potential Impacts

Construction

B.10.48 Construction operations will generate waste materials as a result of general handling losses and surpluses. These materials are likely to be disposed of off-site as wastes and therefore have the potential to affect waste management capacity. The materials are likely to include:

- Concrete;
- asphalt;
- brick;
- glass;
- timber.

B.10.49 There will also be packaging materials such as plastics and paper. Any unused paints, timber treatments etc. may also require off-site disposal as hazardous materials.

Completed development

B.10.50 The users of each of the completed development will produce wastes which will require disposal and which by virtue of the volumes which will arise are likely to give rise in the long term to a more significant impact upon the waste management capacity within Oxfordshire.

Cumulative Impacts

B.10.51 In addition to the proposed development, other land in Banbury, including Land South of Salt Way at Crouch Farm and Longford Park, will also generate waste during their construction and occupation and therefore there is potential for cumulative

impacts on the waste management capacity in the area.

Impact Significance

Significance Criteria

B.10.52 The following criteria have been used for the purposes of this report to provide an indication as to the significance of possible impacts upon available waste management capacity in the Waste Planning Area.

- Major Impact : Waste generated by the development would utilise 40-100% of available waste management capacity in the Oxfordshire area;
- Moderate Impact: Waste generated by the development would utilise 10 – 40% of the available waste management capacity in the Oxfordshire area;
- Minor Impact: Waste generated by the development would utilise 1-10% of the available waste management capacity in the Oxfordshire area;
- Negligible Impact: Waste generated by the development would utilise <1% of the available waste management capacity in the Oxfordshire area.

Construction

New Build Construction

B.10.53 Building Research Establishment (BRE) has produced benchmark data that provides an indication of the average quantity of construction waste that is produced for new builds for each project type (i.e. residential, commercial). Table B10.1 summarises the floorspace of each land use type of the proposed development and the estimated waste generated during construction. It is assumed for the purposes of this assessment that the average dwelling size is a 3 bed-roomed house, each with a Gross External Area (GEA) of 110m^2.

Table B10.1 - Predicted Construction Waste by Class Use

Land Use/Class Use	Estimated maximum area of floorspace proposed within the development (m^2)	Benchmark waste value (data up to May 2012)	Predicted Waste Generation (m^3)
Residential	110,000	18.1m^3/100m^2	19,910
Education	22,200	20.7 m^3/100m^2	4,595
Commercial Offices	5000	19.8 m^3/100m^2	990
Commercial Retail	1000	20.9 m^3/100m^2	209
		Total	**25,704m^3**

B.10.54 As Table B10.1 indicates, up to approximately 25,704m^3 construction waste is anticipated to be generated as a result of the proposed development. It is likely that a significant proportion of this could be recycled or re-used. If based on current Oxfordshirerecycling rates for demolition and construction waste that 86% was recycled/recovered and 14% landfilled, the development would therefore generate up to 3599m^3 of waste to landfill and this would equate to <0.1% of the remaining annual landfill capacity, resulting in a negligible adverse impact.

B.10.55 From review of the Oxfordshire Minerals and Waste Development Framework Annual Monitoring Report it is considered that there is sufficient waste management recovery/recycling capacity to deal with the estimated generated construction materials of 22,105m^3 which could be recycled or reused.

Completed Development

Household Waste

B.10.56 The site will generate household and commercial wastes which will require disposal and in an appropriate way in accordance with the Waste Management Hierarchy.

B.10.57 The waste arising from the site, when completed, will comprise predominantly domestic waste. Waste materials arising from the proposed development will have an impact on waste management facilities and any residual waste upon the landfill capacity. A significant proportion of the waste materials generated from the proposed residential and commercial premises will be classified as household and municipal wastes.

B.10.58 The proposed development will include up to 1000 new dwellings.

B.10.59 The average household waste generated in kg/household/year in Oxfordshire is 1,033kg. This equates to up to approximately 1033,000kg or 1,033 tonnes of household waste being generated annually by the proposed development. The development would therefore give rise to an increase of less than 1% of household waste in Oxfordshire per year.

B.10.60 If the 67% landfill diversion rate is maintained then 33% of 1033 tonnes of the household waste generated each year by the development will require landfilling - 341 tonnes. If the 75% recovery of waste target is met by 2020 approximately 258

tonnes a year will require landfilling. There is approximately 17.4 million tonnes of available landfill capacity and therefore this equates to a <0.1% impact on the available landfill capacity.

Commercial waste

B.10.61 The proposed development will generate commercial wastes which will require disposal and in an appropriate way in accordance with the Waste Management Hierarchy.

B.10.62 As part of the requirements under The Waste (England and Wales) (Amendment) Regulations 2012, businesses will have to confirm that they have applied the waste hierarchy when transferring waste. The regulations also require the separate collection of waste paper, metal, plastic and glass from 1st January 2015. With the continuous drive to encourage businesses to recycle and with the implementation of the Waste (England and Wales) Regulations 2011, businesses' recycling rates will improve and the proportion of commercial waste sent to landfill should reduce.

Cumulative Impacts

Cumulative Impacts - New Build Construction

B.10.63 In addition to Wykham Park Farm, there are other sites within the Banbury area which need to be considered when addressing cumulative waste impacts. These include Land South of Salt Way at Crouch Farm, Bloxham Road and Longford Park. B10.2 identifies the land uses within each of these developments.

Table B10.2 - Predicted Construction Waste by Class Use

Land Use/Class Use	Estimated maximum area of floorspace proposed within the development (m^2)	Benchmark waste value (data up to May 2012)	Predicted Waste Generation (m^3)
Land South of Salt Way at Crouch Farm			
Residential *	15,950	18.1m^3/100m^2	2,887
Longford Park			
Residential	117,700	18.1m^3/100m^2	21,304
Employment	2,200	20.9m^3/100m^2	460
Other (retail etc)	2,200	20.9m^3/100m^2	460
		Total	25,111

*It is assumed for the purposes of this assessment that the average dwelling size is a 3 bed-roomed house, each with a Gross External Area (GEA) of 110m^2.
** Figures not know. Estimated to be similar floorspace as the employment uses.

B.10.64 The estimated combined total of waste produced by the proposed scheme (refer to Table B10.1) and the cumulative assessment schemes (refer to Table 10.2) amounts to 50,8157m^3. If based on currently Oxfordshire construction recycling rates 86% was recovered/recycled and 14% landfilled this would equate to 7,100m^3 of waste to landfill and this would equate to <0.1% of the remaining annual landfill capacity, resulting in a negligible adverse impact.

B.10.65 The developments are expected to fall under the requirements to produce site management plans and that a significant proportion of construction wastes will be either reused or recycled. No significant cumulative impact on waste management facilities and landfill capacity is therefore expected as a result of these proposed developments.

B.10.66 The diversion of waste from landfill is therefore estimated to cause an increase in volume of waste to be managed through recovery, recycling/composting treatment facilities.

Household waste

B.10.67 The proposed development at Land South of Salt Way at Crouch Farm will include up to 145 new dwellings. The proposed development at Longford Park will include up to 1070 new dwellings.

B.10.68 The maximum number of new dwellings built when the above two sites are taken together with the proposed development at Wykham Park Farm would be 2215. This number of dwellings could be expected to therefore generate in the region of 2288 tonnes per year which equates to an approximate cumulative percentage increase of 0.76% of waste generated.

B.10.69 If the 67% landfill diversion rate is maintained then 33% of the 2288 tonnes of household waste generated each year by all the developments together and requiring landfilling will be 755 tonnes. If the 75% recovery of waste target is met by 2020 approximately 572 tonnes per year will require landfilling. There is

approximately 17.4 million tonnes of available landfill capacity. If 755 tonnes of household waste is landfilled per year this equates to a <0.1% impact on annual available landfill capacity.

Commercial and Industrial waste

B.10.70 With the continuous drive to encourage businesses to recycle and with the implementation of the Waste (England and Wales) (Amendment) Regulations 2012, businesses' recycling rates will improve and the proportion of industrial waste sent to landfill should reduce and the impact will therefore be negligible and of minor significance.

Mitigation Measures

Construction

B.10.71 A Site Waste Management Plan (SWMP) will be produced in accordance with The Site Waste Management Plan Regulations 2008. A SWMP is required to be produced by the client and prior to any commencement of work and passed onto the appointed Principal Contractor for any projects with a construction phase cost greater than £300,000 (excluding VAT).

B.10.72 It is recognised that this the preparation of this plan allows the client, project managers, designers and contractors to consider, at an early stage of the project, ways to minimise waste (through purchasing strategies or methods of work aimed at reducing waste), and ways that materials can be re-used or recycled as part of the project.

B.10.73 The information required under the regulations for updating SWMP differs depending on the cost of the project i.e. (i) projects costing between £300,000 and £500,000; and (ii) projects above £500,000. A greater level of detail is required for projects which have a construction cost above £500,000.

B.10.74 For projects above £500,000 and the document will be required to contain the following information):

- Details of the Client, Principal Contractor and author of the SWMP;
- Location of site and estimated cost of project;
- A description of the types of waste to be removed from site;
- An estimation of the quantity of each type of waste to be produced;

- Identification of the waste management action to be taken for each waste type (including re-using, recycling, recovery and disposal);
- A declaration that the Client and Principal Contractor will:
  1) take all reasonable steps to ensure that all waste will be dealt with in accordance with the waste duty of care section in Section 34 of the Environmental Protection Act 1990 and the Environment Protection (Duty of Care) Regulations 1991; and
  2) materials will be handled efficiently and waste managed appropriately.
- identification of person who removed the waste and their waste carrier registration number;
- a copy of or reference to the written description of the waste;and
- details of the site the waste was taken to.

B.10.75 The SWMP will be a "*live*" document which will be updated throughout the life of the project. The Appointed Principal Contractor will ensure a copy is kept on-site and accessible at all times to contractors and clients and will ensure that relevant information is obtained from sub-contractors. The SWMP must contain a record of the types and quantities of waste reused, recycled, sent for recovery, sent to landfill or otherwise disposed of. On completion of the project it will be handed back to the Client and the Principal Contractor is required to retain a copy for two years after completion of the project. Within 3 months at the end of the construction phase the Principal Contractor will have to confirm that the plans was monitored and specify the reasons for any differences as to what was set out in the plan and what actually happened on site[33].

B.10.76 All waste produced during construction operations at the application site will be stored in designated areas and isolated from the surface water drainage system. Skips will be covered to prevent debris being blown out and will be replaced when full by conventional waste collection contractors. Recyclable wastes and specialist packaging will be collected and sent for recycling and utilised on site, where practicable.

B.10.77 Excavation spoil will be utilised wherever possible within the proposed development scheme and every effort will be made to dispose of the material for a beneficial use.

[33] http://www.netregs.gov.uk/netregs/businesses/construction/62359.aspx

If this is not possible, the spoil and other wastes likely to arise from construction operations every effort will be made to recycle or reuse it elsewhere within Oxfordshire or disposed of at a licensed landfill site as a last resort.

Completed development

Detailed Design Stage

B.10.78 Detailed design of the site will take into account relevant guidance when considering waste management.

B.10.79 As the planning application is for outline planning permission, detailed layouts are not available for the individual development areas but this chapter of the ES considers the likely generation of waste through the construction phase and the proposed land uses of the development.

B.10.80 An extract of the BS5906: 2005 Waste Management in Buildings Code of Practice states that:

> *"The developer or his agent should reach agreement with all appropriate authorities, particularly upon the following points:*
>
> *a) The methods of storage, segregation, on-site treatment and collection of waste, including recyclable material, to be used for the form of layout and building density adopted.*
>
> *b) A designated location for waste including recyclable material storage, segregation and treatment areas to be provided and means of access to them for waste collection staff and vehicles.*
>
> *c) The storage capacity to be provided with allowance for the frequency of collection specified by the collection authority, the volume and nature of waste including recyclable material expected and the size and type of containers to be used.*
>
> *d) The responsibility for cleansing and maintenance of storage facilities.*
>
> *e) Environmental aspects, e.g. air pollution, indoor air quality, noise control, and litter abatement.*
>
> *f) The discharge of waste into sewers (e.g. food waste disposers).*
>
> *g) Means of escape and fire-fighting arrangements in waste and recyclable material storage and collection areas.*
>
> *h) Appropriate arrangements for older persons and persons with disabilities."*

B.10.81 These aspects will be taken into account in the detailed design of the Wykham Park Farm development site.

B.10.82 Many issues outlined above can be mitigated through appropriate design and location of waste storage and collection facilities.

B.10.83 The production of waste materials from the completed development can be mitigated by encouraging waste minimisation and commercial recycling schemes.

B.10.84 At the detailed design stage consideration will also be given to the following:

- Prominence of skips/waste bins within the development;
- Adequate storage space for skips/bins to avoid obstructing the pavements;
- Providing convenient locations/ease of access for producers of waste and for collection;
- Adequate surfacing of waste storage/collection points to avoid damage from refuse collection vehicles;
- Separation of waste and recycling;
- Careful design to avoid pollution issues (i.e. odours, vermin);
- Fire safety issues of waste storage areas and impact upon public health.

B.10.85 It is recognised that many issues can be mitigated through appropriate design and location of waste storage and collection facilities.

Household Waste

B.10.86 The production of waste materials from the completed development can be mitigated by encouraging household compositing and waste minimisation, and household/commercial recycling schemes such as:

- Kerbside collections;
- Paper collections;
- Bottle banks;
- Plastic container recycling;
- Textile recycling; and
- Can recycling.

B.10.87 Cherwell District Council's website states that household waste in Cherwell district is collected on alternate weeks as follows:

Week 1

- Green wheelie bin – collection of residual refuse;

Week 2

- Blue recycling box – dry recyclables (Food and drinks cans, plastic bottles and containers, newspapers, magazines and directories, paper, card and aerosols)
- Brown bin - food and garden waste;

Commercial and Industrial Waste

B.10.88 Businesses will have to arrange a contract with the Council or other commercial waste contractor to suit their needs. There are advice organisations, trade and commercial organisations as well as regulatory bodies such as the Environment Agency in the UK which offer advice to commercial businesses to tackle the waste problem. The main issues for businesses are to identify the waste streams they produce, establish possibilities for waste minimisation and identify recycling opportunities. Information for different business sections is available form organisations such as Envirowise, WRAP, the Environment Agency and ARENA network. All these have been set up to help England to achieve its waste minimisation and recycling targets set out in the Waste Strategy 2007 which in turn will help to comply with European legislation e.g. the Waste Framework Directive and the Landfill Directive.

B.10.89 As part of the requirements of the Waste (England and Wales) Regulations 2012, businesses will have to confirm that they have applied the waste hierarchy when transferring waste. The regulations also require the separate collection of waste paper, metal, plastic and glass from 1st January 2015.

Residual Impacts

Construction

B.10.90 The estimated levels of waste generation during the construction for the development that are likely to requiring disposal to landfill can be accommodated in landfill sites in the Oxfordshire Plan Area. The total volume requiring disposal during each year of the construction of the proposed development is likely to represent a small percentage of the annual tonnage landfilled in the region. Where possible recycling facilities for construction wastes will be utilised to minimise the

waste produced.

Completed Development

B.10.91 Residual waste materials from the completed development which cannot be re-used, recycled or recovered are likely to be disposed of to landfill within the Minerals and Waste Local Plan area. The residual impact is therefore likely to have effect at a local and district level and to be relatively minor in nature.

B.10.92 The use of landfill capacity for non-recyclable wastes from the completed development is not reversible and therefore will have a long term impact on the overall availability of landfill capacity. However, if the site were not to be developed in order to meeting employment requirements, it is likely that an equivalent floorspace of employment units would be constructed in the Oxfordshire area and the predicted impact upon landfill capacity from new build and construction would still occur.

B.10.93 There is sufficient capacity in waste management facilities in the area to handle the recyclable and recoverable wastes that are estimated to be generated from the proposed development.

Summary

B.10.94 There will be small adverse impact on the availability of landfill capacity, as a result of the disposal of non-recyclable wastes from the development. This impact will include a reduction in the total landfill space available for other wastes. Wastes materials from the development are likely to be disposed of to landfills in the local area with any residual hazardous materials taken further afield to adjoining counties. The impact is therefore likely to have effect at local or district scale rather than a regional level. As a result of the mitigation measures which will be applied, the impacts on local landfill availability are likely to be relatively minor overall. The use of landfill capacity for non-recyclable wastes from the development is not reversible and therefore will have a long-term impact on the overall availability of landfill capacity in the area.

B.10.95 With the planned projects in place it is anticipated that the impact of the proposed development on the County's ability to handle the recyclable and recoverable wastes generated by the proposed will be negligible.

B.11 PUBLIC UTILITIES AND SERVICES

Introduction

B.11.1 The provision of public utility services for the development has the potential to cause adverse environmental effects.

B.11.2 In order to establish the baseline conditions, details of existing services have been obtained from the public utility companies and are described below. The presence of existing services across the site is shown on Drawing Number B11.1.

Electricity

B.11.3 Western Power Distribution (WPD) records show a significant amount of 11kV overhead and underground cables, pole mounted transformers and 400V overhead and underground cables within and around the site boundary.

B.11.4 This infrastructure within the site may need to be diverted to allow development.

B.11.5 The site is situated at the boundary of the East Midlands and West Midlands regions. Both these regions are run by WPD. Due to this it is believed the infrastructure in the area is not capable of providing the capacity required to source a 1000 unit domestic development. Upstream re-enforcement is likely and will be confirmed with WPD at the detailed design stage.

B.11.6 It is anticipated that the off-site work required to reinforce the electricity supply network will have no significant environmental impact.

Gas

B.11.7 Scotia Gas Networks (SGN) records do not show any infrastructure within the site boundary. There are low and medium pressure mains in the surrounding area.

B.11.8 The size of the medium and low pressure mains in the surrounding area would suggest that there is sufficient capacity to supply the proposed 1000 unit domestic development. This will need to be confirmed with SGN at the detailed design stage.

B.11.9 It is anticipated that the off-site work required to reinforce the gas supply network will have no significant environmental impact.

Potable Water

B.11.10 Thames Water records show two trunk mains which run through the site as detailed below:-

- A 700mm diameter cast main which may have an easement of 3m either site of the main.
- A 600mm diameter main which may have an easement of 3m either site of the main.

B.11.11 There are other several other mains of a variety of diameters which surround the site.

B.11.12 The water mains are located within fields which are shown on the Parameters Plan (JJ043/27/B) as public open space located within the eastern part of the site.

B.11.13 The sizes of the potable water mains which surround the site suggest there is sufficient capacity to supply the proposed 1000 unit domestic development. This information would need to be confirmed with Thames Water at the detailed design stage.

B.11.14 It is anticipated that the off-site work required to reinforce the water supply network will have no significant environmental impact.

Telecoms

B.11.15 Orange, Telent, Cable and Wireless and Colt do not have any infrastructure in the area.

Virgin Media

B.11.16 Virgin Media (VM) records show none of their infrastructure within the site boundary however there is plant and apparatus within the surrounding area.

B.11.17 Virgin Media should have the capacity to provide telecoms for the proposed 1000 unit domestic development. . It is not known at this stage how specifically VM would serve the development. This information will be confirmed with VM at the detailed design stage.

B.11.18 It is anticipated that the off-site work required to reinforce the VM supply network will have no significant environmental impact.

BT

B.11.19 BT records show none of their infrastructure within the site boundary however there is significant plant and apparatus within the surrounding area.

B.11.20 BT should have the capacity to provide telecoms for the proposed 1000 unit domestic development. It is not known at this stage how specifically BT would serve the development. This information will be confirmed with BT at the detailed design stage.

B.11.21 It is anticipated that the off-site work required to reinforce the BT supply network will have no significant environmental impact.

Summary

B.11.22 Investigations with public utility service providers have determined that it is anticipated that suitable levels of supply to the proposed Wykham Park Farm site can be achieved for all key services. Work is continuing to determine the most suitable arrangement to achieve connection to the site. There is likely to be electrical infrastructure within the site which may need to be diverted to allow development. Upstream-reinforcement is also likely for the electrical infrastructure and will be confirmed with WPD at the detailed design stage. In most instances connections to services require only short extensions to the existing network.

B.11.23 It is anticipated that the off site work required to reinforce the key public utility service networks will have no significant environmental impact.

B.12 SOCIO-ECONOMIC EFFECTS

B.12.1 This chapter of the Environmental Statement has been prepared by David Lock Associates Ltd (DLA). The Socio-Economic chapter considers the way in which the proposed development has the potential to affect local socio- economic issues. The assessment takes into consideration the context of the policy framework as well as the socio-economic profile of the areas that are most relevant to the Wykham Park Farm (WPF) development. The findings of the baseline and strategic context set out the framework within which the impacts of the development proposals are examined.

B.12.2 The chapter will comprise the following sections:

- Scope and Method of Assessment – an overview into the nature of the assessment and the approach adopted.
- Baseline conditions – an assessment of the prevailing socio economic conditions in Banbury, Easington Ward and the District of Cherwell (and where possible for the development site's immediate context area) in terms of the demographic profile, economic activity, unemployment, employment deprivation, skills and occupational structure, business base, housing stock and affordability, quality of the living environment.
- Assessment of existing social infrastructure - assessment of the current supply of social infrastructure in terms of health facilities, education facilities, sports and leisure services, and open space within the context of the application site.
- Impact Assessment – this will comprise a statement of impacts in relation to the proposed development arising during both construction and operations, including:
    - Construction stage employment impacts;
    - Operational stage employment impacts;
    - Operational stage demographic impacts;
    - Operational stage appropriateness of social infrastructure; and
    - Operational stage of wider regeneration impacts.

Methodology and Scope

B.12.3 The issues which are addressed as part of this chapter comprise:

- Any impact on the characteristics of the local population as a result of the

proposed development that will be created;

- Any impact arising from the employment provision within the application site and the number of jobs likely to be created as a result of the proposed development;
- Any impact arising from the proposed community facilities in the existing centres surrounding the site;
- Any impact on the education provision as a result of the proposed development; and
- Any impact on the provision of open space for play, sport, recreation as a result of the proposed development.

Reference Materials and Assessment Method

B.12.4 An audit of the current provision (or baseline position) of the local characteristics of the economy, health, environment, community safety, equalities, learning, housing and transport has been undertaken.

B.12.5 The baseline information provided in this chapter has been sourced from primary and secondary data sources during 2012, including data available from the ONS, local data sources and information from relevant studies undertaken on behalf of the Local Authority.

B.12.6 The Cherwell Local Plan submission version (2012) and the Cherwell Saved Local Plan policies (1996) and recent Ordnance Survey maps provided an initial overview of the location of facilities, services and transport routes in the area. This was supplemented by internet searches, using Google and other online local directories, to establish the level of existing provision. For certain facilities organisation web sites provided the most up to date information (eg. the NHS Trust lists dentists and doctors).

B.12.7 For each service or facility, an area was identified around the site within which it was considered that most people would be willing to travel. Current transport routes and services were factored into this judgement. The distance is considered acceptable but varies depending on the service but generally covers the Banbury/Easington area and other substantial settlements within close proximity to the site, such as Bodicote and Bloxham.

B.12.8 After identification of the baseline conditions, the impact of the proposals is assessed by evaluating the demand for additional facilities and services, relating demand to the provision made in the area already and the provision of new facilities within the development proposals.

Limitations of the data

B.12.9 In the context of the analysis that has been undertaken in this chapter, it is important to note the following assumptions and limitations:

- The application proposals are for up to 1,000 new dwellings which will include a range of house types and sizes which are likely to attract a range of future occupants both from nearby and from locations further away.
- An employment allocation of up to 1.7 hectares of business (B1uses).
  A Local Centre including a mix of retail (A1 uses) business (B1 uses) services (A2-A5) Leisure (D2 uses) and community uses (D1 use) including a public square will be included in the application. It is assumed that the Local Centre, whilst designed to accommodate the quantum of development commensurate with the daily needs of the WPF population, will also be used by the residents of adjacent settlements e.g Easington, Bodicote and Banbury as part of their choice of local facilities. It is anticipated that the local centre will serve the daily shopping needs of residents in each catchment area, rather than providing larger scale retail units designed to serve a larger population.
- Provision is made for education facilities on site through the identification of a site for a new two form entry primary school on land of up to 2 hectares.
- The proposal has been developed as a Sustainable Urban Extension intended to be sustainable in all senses – environmentally, socially and economically.

B.12.10 There are inherent difficulties associated with determining the significance of socio-economic impacts. Therefore it is inevitable that there will be a degree of subjectivity in assessing the nature of impacts described. Notwithstanding this the chapter does describe the principal effects in terms of whether the impacts are beneficial or adverse, permanent or temporary, and major, moderate, minor or insignificant.

Other Considerations

B.12.11 The Longford Park (Bankside) development is 74.4 ha site located to the south east of Banbury on the Oxford Road (A4260). It is located approximately 640m to the north east of the Wykham Park Farm site. The site has the Oxford Canal along part of the eastern boundary. This site was considered by the Council to be acceptable for development and Outline planning permission was granted for 1070 residential units with associated facilities (including primary school, playing fields, local shops and community facilities, 2,200m^2 of employment provisions (Use class B1 Business) in September 2009.

B.12.12 An assessment of other forthcoming developments in the surrounding area was also undertaken to establish if there may be any cumulative impacts of this development. Discussions with the Planning Department at Cherwell have indicated that there are no other major applications with consent that could be considered in relation to this site. There have been a number of screening and scoping assessments undertaken however which suggests there is potential development in the pipeline but not in close proximity to WPF. The screening/scoping applications relate to:

- 12/00004/SCOP: Land off Warwick Road and north of Hanwell Fields for 380 dwellings;
- 12/00002/SCOP: Land west of Warwick Road for 300 dwellings;
- 12/00001/SCOP: Land east and west of Southam Road for around 900 dwellings; and
- 11/00022/SO: Land north of Withycombe Farm for 400 dwellings.

B.12.13 A number of the sites above relate to proposed strategic housing sites within the emerging Local Plan and as such would have been subject to the councils own impact assessment.

B.12.14 An appeal has been lodged in relation to an outline residential development for up to 145 dwellings and associated development at Land South of Salt Way at Crouch Farm, Bloxham Road. The appeal commenced in November 2012. This site will be given limited consideration in the assessment of impacts of the WPF in relation to possible cumulative effects.

B.12.15 The cumulative impact ofLongford Park (Bankside)development in relation to the Wykham Park Farm development is considered low, as Longford Park has been

assessed by the Council as being acceptable and offers a range of facilities to serve the development. The facilities will also likely serve this part of Banbury including Cherwell Heights. Construction of this site is yet to begin.

B.12.16 In addition an application is being prepared for a site on land adjoining Bretch Hill, off Stratford Road, which borders the villages of Drayton and Wroxton to the West of Banbury town. The proposal is on a proposed allocation in Cherwell District Council's emerging Local Plan. The application is currently being consulted on by the developer but permission has not yet been granted.

Baseline Conditions

B.12.17 The baseline information has been gathered from a range of sources including locally produced documents and statistics gathered from the Office for National Statistics. However at the time of the analysis, only a limited amount of the 2011 Census data has been released by Government therefore some of the data relates to the 2001 census and other mid-year statistics.

B.12.18 This assessment seeks to identify and assess the land use changes and changes in socioeconomic activities, which may arise from the proposed development. Unlike other environmental topics, such as noise, the sensitivity of socioeconomic receptors to the proposed development is not determined by reference to designations or an objective standard. Instead, it is the nature of the activity that the human receptor is undertaking that is most influential in determining sensitivity. Professional judgement has therefore been applied in the case of each category of receptor considered in this chapter, with the degree of change to the receptor arising from the proposal determining whether or not an effect is likely to be significant.

Study Area

B.12.19 The spatial scope for undertaking baseline research has taken into account the following considerations:

- The site location within the Easington Ward of Banbury (in the District of Cherwell) and surrounding settlements;
- The wider Banbury settlement characteristics and strategic location; and
- The components of the proposal and their likely catchment area – including the neighbouring settlements of Easington and Bodicote.

Population/demographics

B.12.20 The total population of Cherwell District was estimated as 141,900 (2011 census information) and Banbury Easington's population was 7, 598 at the 2001 census with a mid-census analysis suggesting it had fallen moderately to 7511. The population of Oxfordshire at the 2011 census was 653,800.

B.12.21 Cherwell District's population has grown by 8% since the last census was taken in 2001 which represents a fairly high growth rate and mirrors the growth rate of the whole of Oxfordshire. In the past 30 years, the total resident population of Cherwell District has increased by over 30,000 which equates to adding a town the size of Bicester.

B.12.22 In relation to the age profile of Cherwell District and Banbury (Easington Ward) where the site is located the median age of the population is 41.71 in Banbury (Easington Ward) and 37.31 in Cherwell District. In comparison with the rest of the UK where the median age is 37 we can see that the resident population of Banbury Easington ward is significantly older, whereas Cherwell District is about average. This reflects the relatively low proportion of young people.

B.12.23 Cherwell District had a national deprivation ranking of 276 in 2007. In the county rankings, Oxfordshire has relatively low levels of deprivation, coming 137th out of 149 counties.

B.12.24 The census states that 15.9% of households in the ward of Banbury Easington fall below 60% of the median income, and are recognised as households in poverty (April 2007 – March 2008 census data).

Housing

B.12.25 With regard to the district's housing market, according to the 2011 Census there are 56,700 households in Cherwell and at the 2001 census there were 3,169 households in Banbury Easington.

B.12.26 In relation to the Districts housing market, analysis of the 2011 census data indicates that in Banbury Easington the majority of households are living in detached houses

or bungalows or in semi detached houses or bungalows, with a relatively small proportion of households being flats, or maisonettes.

B.12.27 The analysis of the type of tenure in the district and ward according to the 2001 census data indicates that the majority of homes are owner occupied with a mortgage or a loan, with a relatively small proportion of homes rented from the Council or a Housing Association. In Banbury Easington Ward, the number of homes that are owned outright by the occupier is relatively high at 41.43% in relation to the rest of England being just 29% and for Cherwell district the figure is just 26%. This perhaps reflects the higher median age of the residents of Banbury (Easington ward).

Affordable housing

B.12.28 Cherwell's Housing Needs Study of July 2009 estimated that, if current levels of supply of affordable housing were maintained, 288 additional properties would be required over each of the next 7 years to meet the arising and backlog need. The Non-Statutory Cherwell Local Plan makes provision for at least 1,605 affordable dwellings out of a total 5,845 dwellings on identified sites (AMR 2011).

B.12.29 Policy BSC 3 of the emerging Local Plan submission version states that in order to meet their targets at Banbury and Bicester, all proposed developments that include 10 or more dwellings (gross), or which would be provided on sites suitable for 10 or more dwellings (gross), will be expected to provide at least 30% of housing delivery as affordable homes on site.

B.12.30 In relation to housing for the elderly, Cherwell's Housing Strategy for Older People (2010-2015) prioritises providing and supporting preventative support services, increasing the provision of older peoples' specialist housing, improving the provision of information and advice and ensuring new housing developments meet the needs of older people now and in the future.

B.12.31 The analysis of housing has revealed that Cherwell District continues to face major challenges especially in terms of providing affordable housing. The current market is likely to further delay the delivery of additional housing in the area. Altogether this analysis suggests that in order for Cherwell and Banbury Easington to keep its generally low level of deprivation the provision of affordable housing will be essential.

Employment

B.12.32 Employment data for Cherwell suggests that the number of people who are economically active is above the average for the South East. Cherwell has an economic activity rate of 82% compared to the south east figure of 79.4% (2010 ONS mid year figures) Unemployment and claimant figures for Cherwell are fairly low at 1.6% in comparison with the rest of the south east (2.5%) and Great Britain (3.8%).

B.12.33 In respect of job density, Cherwell has a density of 0.83 which is higher than the south east density of 0.80 and the Great Britain figure of 0.77. This information suggest that in relation to the number of jobs per resident aged 16-64, there are not enough jobs to meet the number of people. This suggests that any employment creating initiatives in the district are likely to reduce this trend.

Area	**Job Density Per resident**
Cherwell	0.83
South east	0.80
Great Britain	0.77

Employee Jobs (2008 – ONS mid year statistics)

	Cherwell (employee jobs)	**Cherwell (%)**	**South East (%)**
Total Employee Jobs	67,100		
Full Time	47,700	71.1	69.0
Part Time	19,400	28.9	31.0
Employee Jobs by Industry			
Manufacturing	8,000	12	8.1
Construction	2,900	4.3	4.5
Services	55,000	82	85.7
Distribution, hotels, restaurants	18,200	27.2	24.6
Transport & Communications	3,900	5.9	5.9
Finance, IT, other business activities	12,100	18.0	24.0
Public admin, education & health	17,400	25.9	25.6
Other services	3,400	5.0	5.6
Tourism related	4,400	6.6	8.2

B.12.34 Within the employment sectors, as is consistent with the national and regional trend the service industry is the highest employment sector. However within this category employment within Finance, I.T. and other business activities is significantly lower in

Cherwell than in the rest of the south east, with the highest proportion of employment within this sector coming from distribution, hotels and restaurants.

B.12.35 In terms of full time and part time working patterns it seems that Cherwell is above the south east average in the number of people who are employed full time. 71% of employed people are employed full time in comparison to just 69% in the south east.

B.12.36 Over the period 2001-2011 the working age population of Cherwell also had a relatively low growth, increasing by just under 1,000 or a rate of 0.1% p.a. This may go some way to explaining the relatively slow rate of employment growth in the district.

B.12.37 Between 2007 and 2008 the Annual Business Inquiry data showed a small drop in the overall number of employees in Cherwell (down by 1%) with reduced numbers of employees particularly in the agriculture, construction and finance sectors (Living in Cherwell, 2010).

B.12.38 Rates of claimants of health-related benefits in Cherwell are above the average for Oxfordshire County but below the south east average with the exception of Attendance Allowance which is above the county and regional average (Living in Cherwell, 2010).

B.12.39 The current economic climate is likely to pose a threat to Cherwell's key employment sectors. In particular the districts strongest employment sector distribution, hotels, and restaurants are likely to slow down further due to the current wider economic situation. Similarly the second and third largest employment sectors (finance, IT, other business activities and public admin, education & health) could also experience a slowdown.

B.12.40 Cherwell's AMR (2011) work on the emerging 'Employment Land Study' for the district indicates that structural changes in the economy are resulting in higher job densities on storage/distribution land. Cherwell District is particularly well located to offer advantages to warehousing/distribution occupiers including good transport links with the M40. The emerging Study projects significant demand for warehouses and logistics to 2026, and so we may continue to see a high proportion of 'B8' use completions in the future.

Assessment of Existing Social Infrastructure

B.12.41 This section provides a summary of the assessment of the current supply of social infrastructure in terms of health facilities, education facilities, community facilities and sports, leisure and open space facilities, within the development's context area. As part of the establishment of the baseline of social infrastructure, a review of the current health and educational facilities is provided.

B.12.42 As part of the establishment of the baseline provision of social infrastructure, a review of the current health and educational facilities was undertaken, along with an assessment of what open space facilities and local facilities are available for the community of WPF in Banbury.

Educational Facilities

B.12.43 Oxfordshire County Council is the Local Education Authority for Banbury. Education in Banbury is currently provided on a 4-7 year old pupil age for infant schools, a 7-11 year old pupil age for junior schools, a 4-11 year old pupil age for primary schools, and an 11-16 year old range for secondary schools; and up to 18 years for secondary schools with sixth forms.

Primary Education

B.12.44 There is one primary school located within the catchment area of the site; Bishop Loveday Church of England School, located in the village of Bodicote.

B.12.45 There are five further Primary Schools located in the area surrounding the site; these include St John's RC School, St Joseph's School, The Grange County School, Queensway School, St Mary's Church of England and also two further voluntary-aided Primary Schools, Bloxham Church of England School and Christopher Rawlins Church of England School.

Secondary Education

B.12.46 Pupils from the assessment area can apply for admission to the ODC Banbury Academy Secondary School, subject to the individual school's entrance requirements.

B.12.47 Located slightly further away from the site, are the Blessed George Napier School, and Banbury Academy (which includes a Lower School and Sixth Form), both located in Banbury.

B.12.48 The independent boarding schools of Bloxham School and Tudor Hall School are also in close proximity to the WPF site.

Early Years Provision

B.12.49 There are four Pre-Schools located in the Banbury area; Smart Tots Day Nursery, Child First, Rainbows Day Nursery, and The Close Nursery School; all of which are in close proximity to the site.

Health Facilities

B.12.50 Oxfordshire Primary Care Trust is responsible for commissioning health and adult social care for local people and delivering local community health and adult social care services (including GPs, dentists, pharmacies, opticians and so forth).

B.12.51 General Practice (GP) surgeries, dentists, pharmacists, and local hospitals have been identified as part of this assessment. This established that a number of the local GPs had the capacity to take on new patients.

B.12.52 Local GP Surgeries currently accepting new patients:

- Hightown Surgery, Hightown Gardens, Banbury
- Windrush Surgery, 21 West Bar, Banbury
- Windrush Sergery, 12 Bradley Arcade, Bretch Hill, Banbury
- Godswell Lodge Surgery, Godswell Lodge, Church Street, Bloxham

B.12.53 Local GP Surgeries currently *not* accepting new patients:

- Horsefair Surgery, South Bar House, Banbury

B.12.54 Private dental surgeries and pharmacies are delivered under open market conditions and are based on the strength of local demand. Therefore, it is assumed that where demand exceeds supply the gap will be met by an individual pharmacist or dentist opening a shop/clinic in the area.

B.12.55 There is one hospital located in Bicester; this is Bicester Community Hospital. There is also the larger John Radcliffe Hospital based in Oxford. Consultation of publically available information from the PCT website suggest that both of these hospitals are operating within their capacity, and that their future needs will be met through plans set out in their own development plans.

Community Facilities

B.12.56 Investigations have demonstrated that there is currently an adequate supply of youth, leisure and community centres in the wider area to meet current demand. The primary location for community facilities is at Banbury. In this District Centre to the north of Oxfordshire, provision of a day nursery, a health care centre, Post Office, a library, a dental practice and an optician is located.

B.12.57 Further south-west in Bloxham additional community facilities are provided including a pharmacy, dental practice, veterinary clinic, Post Office, a church and a range of public houses.

B.12.58 Further east of the site Bodicote provides a range of public houses, Post Office and a church. To the south east of the site Adderbury also provides a community centre.

Open Space

B.12.59 The Cherwell Open Space Update 2011 indicates the following requirement for open space standards:

- Parks and gardens – 0.48 ha per 1000 population;
- Natural/ semi-natural green space – 1.8 ha per 1000 population;
- Amenity green space – 0.94 hectares per 1000 population;
- Allotments – 0.37 hectares per 1000 population;
- Children and young persons – 0.78 hectares per 1000 population (0.59 ha per 1000 pop for younger children and 0.19 ha per 1000 pop for older children's provision); and
- Outdoor sports provision – 1.13 ha per 1000 population.

B.12.60 The outdoor sports local standard is 1.13ha per 1000 population (retained standard as no further review has been undertaken, consistent with the Draft Local Plan 2012).

B.12.61 Analysis of natural greenspace provision in the South East of England by Natural England and Forestry Commission shows Cherwell ranked second to bottom (behind all other district and unitary authorities in the region other than West Oxfordshire), with 72% of households meeting none of the Accessible Natural Green Space requirements. (Living in Cherwell document 2010)

B.12.62 Cherwell District Council's recommended standard in the Draft Local Plan (2012) is 1.13 hectares of outdoor play space and 0.78 hectares for play space (combining provision for younger and older children including MUGAs) per 1,000 residents.

B.12.63 The provision of open space is considered deficient in the rural north of Banbury for outdoor play space (Cherwell Green Spaces Strategy, 2008-2016) and equates to a shortfall of 10.94 hectares. A need for new equipped play areas and additional play opportunities using other appropriate forms of green space, and improvements to the quality of the existing play areas is identified.

Potential impacts

B.12.64 The proposed development will affect the existing local socio economic environment both during construction and operation. This section provides an evaluation of the impacts and focuses on the following key aspects:

Construction Stage

- Construction stage employment impacts – an assessment of the temporary construction jobs that will be created in the local economy as a result of this stage of the development.
- Construction stage in relation to existing economic activity on the site – an assessment of the impacts of existing businesses and employment uses currently based on site or immediately adjacent to the site as a result of the construction.

Operational Stage

- Operational stage employment impacts – an assessment of the employment impacts of the development once the employment and other commercial floorspace are delivered as part of the development.
- Operational stage demographic impacts – an assessment of the likely scale and age structure of the population based at WPFPark Farm upon

completion of the proposed development.

- Operational stage appropriateness of social infrastructure – an assessment of current (or increased) pre-defined elements of social infrastructure in light of the projected increase in demand as a result of the population generated from the development.
- Operational stage of wider regeneration impacts – an assessment of the development impacts on the identified socio economic priorities of the local area and contribution towards socio-economic policies and strategies reviewed as part of this assessment.

Construction stage employment impacts –summary

B.12.65 One of the key economic impacts is evaluated in terms of the additional employment directly generated as a result of the construction activity. Given the scale of the proposals, the development of the site is likely to lead to the creation of both full and part time construction jobs on site which will likely be maintained on the site for a significant period of time.

Construction Stage impact on existing economic activity on the site

B.12.66 The land is currently given over to farmland and as such there would be no displacement of current businesses on site. The proposed development will provide high quality employment space and provide the opportunity to accommodate new or growing businesses in a quality environment. This would not only safeguard the existing economic activity but would also support its expansion on the site and make a significant contribution to the economy in this part of Banbury and Cherwell. Therefore the construction stage impact on existing economic activity can be classified as having no impact.

B.12.67 There will be a number of operational stage employment impacts of the WPF development. It is possible to clearly identify the positive and long term benefits that are likely to accrue from the provision of both full time and part time jobs in:

- An employment area of up to 1.67 hectares of B1 uses;
- A local centre which will include a mix of A1 retail uses, B1 business uses, A2-A5 service uses, D2 leisure uses and D1 community uses – which will be likely to include a range of services/businesses; and
- A new one form entry primary school.

B.12.68 The applicants will seek to agree with Cherwell District Council the most appropriate method for ensuring maintenance of the open space and community facilities including woodland areas, strategic open space comprising parks with sport pitches, Neighbourhood Equipped Areas of Play (NEAP) and Local Equipped Areas of Play (LEAP) and other informal public open spaces.

Operational Stage Demographic impacts

B.12.69 The development proposals at WPF are for up to 1,000 dwellings. Assuming that this would relate to approximately 1,000 new households for the area, if we apply the average annual income in the Banbury area as £26,411 (Cherwell Housing Needs Estimates; 2009) this suggests that the development can potentially support approximately £26,411,000 per annum of gross household income to be spent within the local economy.

B.12.70 Again, assuming the average household size in Cherwell is 2.45 persons per household, this would suggest that the new WPF development could support an average increase in population of approximately 2,450 people.

Summary

B.12.71 The increase in residents to the area will have an effect on the demand for key community services such as school places and healthcare provision within the vicinity of the development and into the surrounding areas. The impact is therefore considered to be moderate and long-term.

B.12.72 During the construction stage of the development it is unlikely that there will be any demographic impacts, although it is possible that there may be a temporary increase in population in relation to temporary construction workers who may be employed on site.

Operational Stage Impacts on Social infrastructure

B.12.73 This section of the socio economic chapter examines the impact the WPF development will have on the current provision of health, education and other community facilities.

Appropriateness of education facilities

B.12.74 Responsibility for provision of education facilities rests with Oxfordshire County Council, as the Local Education Authority.

B.12.75 Assessment of the development proposals makes provision of up to 2 hectares of land for a one-form entry primary school with enough space to allow it to expand. The provision is designed to meet the needs which will be generated by the WPF development. There are a number of existing schools within the local area which are identified in the baseline assessment which can accommodate increase in capacity. Cherwell District Councils Planning obligations (draft) SPD sets out the contribution that will be sought to ensure that new developments can accommodate either new provision or fund increased capacity as required.

B.12.76 The Planning Obligations SPD (draft 2011) states that contributions for educational infrastructure will be calculated by multiplying the net increase in the forecast number of pupils (at the appropriate age) moving into the new housing by the "cost per pupil" of the required additional infrastructure.

B.12.77 Pupil generation rates per dwelling are set out in the table below:

Pupil generation rates per dwelling:

	1 bed	**2 bed**	**3 bed**	**4+ bed**
Primary (4 – 10)	0.00	0.17	0.39	0.51
Secondary (11 – 15)	0.00	0.09	0.23	0.35
Sixth form (16 – 17)	0.00	0.01	0.03	0.07

B.12.78 To give an indication of the contributions which may be necessary to address the impact of proposals, the cost per pupil for extensions to existing facilities is multiplied by the pupil generation rates per dwelling to reach the contributions per dwelling shown below.

Cost per pupil for extensions to existing facilities:

	Cost per pupil (excluding ICT & Sprinklers)	Cost per pupil for ICT	Cost per Pupil for sprinklers	Total cost Per pupil for extensions (3Q 09)
Primary	£9,607	£1,170	£336	£11,113
Secondary	£14,561	£1,675	£510	£16,746
Sixth Form	£15,591	£1,675	£546	£17,812
SEN				£29,278

Contribution per dwelling:

	1 bed	2 bed	3 bed	4+ bed
Primary	£0	£1,889	£4,334	£5,668
Secondary	£0	£1,507	£3,852	£5,861
Sixth Form	£0	£178	£534	£1,247
SEN	£0	£80	£193	£276
Total	**£0**	**£3,654**	**£8,913**	**£13,052**

B.12.79 It is intended that the planned provision will meet the needs which will be generated by the WPF development however if it is identified that there is insufficient capacity Cherwell District will seek Contributions in order to meet any identified shortfall. Therefore the impact on local schools is considered to be moderate in the short-term and minor in the longer term.

B.12.80 As with the provision of local retail facilities, provision for local education facilities is a key element for the encouragement of sustainable patterns of activity for developments of this scale and nature.

B.12.81 The way in which school places are chosen and allocated does not necessarily mean that every child will go to school locally. It is therefore important that the timing of the school provision is carefully considered to encourage and facilitate as many local children to attend as possible.

Summary

B.12.82 The analysis shows that the development at WPF will have a minimal impact on local primary school education facilities and a moderate impact on local secondary education facilities as an appropriate amount of space will be provided to accommodate a primary school and there are a number of secondary schools within close proximity of the site. Future requirements will be met through the developer contributions charged according to the Councils standards.

B.12.83 Bishop Loveday CoE Primary School falls within the catchment area for the site, which has capacity for 13 pupils (as of 2011 data). The local secondary school is Banbury School which has capacity to take on 701 further pupils (as of October 2011 data).

B.12.84 It is therefore concluded that the impact on local schools is considered to be moderate in the short term and minor in the longer term.

Appropriateness of healthcare facilities

B.12.85 There is at this time, limited information in the public domain on the current capacity of health infrastructure. An initial review of publically available PCT information suggests that there is a good provision of health care services in the vicinity of the development site. It is not clear however if there are any immediate plans to expand the health facilities in the area.

B.12.86 In 2008 The Healthcare Commission gave the Oxfordshire Primary Care Trust (PCT) an overall rating of 'good' in its Annual Health Check. The PCT significantly improved its performance across the board from last year receiving 'good' for quality of services and 'good' for use of resources.

B.12.87 The development proposals for this site make provision for D1 community uses as part of the Local Centre. Whilst there is limited information on current capacity of healthcare infrastructure, the development site is well located in relation to Banbury town and other settlements where there are a number of health care facilities.

B.12.88 New residential development will be expected to contribute towards the provision of additional health care infrastructure to meet the needs generated by population

growth arising from new residential developments where there is not enough spare capacity in existing facilities that are well located to serve the development.

B.12.89 A new facility will be sought on site for a development generating around 7,352 new residents or more. For smaller residential development sites the following contributions apply:

- 1 bed - £215
- 2 bed - £311
- 3 bed - £484
- 4+ bed - £665

Summary

B.12.90 There is limited information on the current capacity of healthcare infrastructure however initial analysis indicates that the healthcare needs are currently being met and that any future demand on services will be met through s106 contributions. It is therefore considered that there will be a moderate, local impact.

Appropriateness of community facilities

B.12.91 At present there are several leisure centres located close to the development site as well as community centres and retail locations, with Banbury town centre being the closest large destination.

B.12.92 Banbury Town centre has a number of facilities including early year's nurseries, community centres, libraries, shops, and other services which can serve the needs of the WPF development.

B.12.93 Within the settlements of Easington and Bodicote which are adjacent to the development site there are a number of public services including pubs and local shopping facilities.

B.12.94 The propose development will deliver a new Local Centre including:

- A mix of retail (A1 uses)
- Business (B1 uses)
- Services (A1 – A5 uses)
- Leisure (D2 uses)
- Community uses (D1 use)

B.12.95 It is intended that this mix of uses will serve the needs of local residents in creating a sustainable development, complementing the exiting local services in Banbury Town as the closest large settlement and the neighbouring settlements of Bodicote and Easington. The proposed facilities will make a positive contribution towards ensuring development of a sustainable new community, and have been specifically designed to meet the needs of WPF new residents and businesses, the mix of uses within the local centre could be used to meet local community needs i.e. early years provision. Further to this, the proposed high quality design of these facilities will assist in creating vibrancy and a sense of community pride.

Summary

B.12.96 There are sufficient existing and local facilities to cater for existing population demand. However, the WPF development is proposing additional community facilities which will contribute positively to the overall accessibility and availability of local resources in both Banbury and Cherwell District.

B.12.97 In consideration of the range of community services already available and the further facilities which will be provided as part of the proposed Local Centre the impacts of the development will be beneficial, moderate and long-term.

Appropriateness of open space facilities

B.12.98 Cherwell District Council's recommended standard in the Draft Local Plan (2012) is 1.13 hectares of outdoor play space and 0.78 hectares for play space (combining provision for younger and older children including MUGAs) per 1,000 residents.

B.12.99 The baseline assessment identified that the provision of open space is considered deficient in the rural north of Banbury for outdoor play space (Cherwell Green Spaces Strategy, 2008-2016) and equates to a shortfall of 10.94 hectares. A need for new equipped play areas and additional play opportunities using other appropriate forms of green space, and improvements to the quality of the existing play areas is identified.

B.12.100 The emerging Local Plan identifies that the District is deficient in quality public open spaces and green infrastructure. The WPF development proposes to make provision for a network of green infrastructure comprising of the retention and enhancement of significant hedgerows and woodland areas, where appropriate; strategic open

space comprising parks with sport pitches, NEAP's and LEAP's; other informal public open spaces; and structural landscape planting.

Summary

B.12.101 The proposals therefore present an opportunity to protect and enhance a key resource and will assist Cherwell in meeting the deficit in their open space provision. The impact of the development on the provision of open space will therefore be beneficial and long-term.

Operational Stage of wider Regeneration impacts

B.12.102 The development of the application site will allow public sector partners to address the issues affecting the communities' socio economic welfare in the surrounding areas. More specifically, the provision of additional employment floorspace, residential units, and community infrastructure has the potential to generate benefits for the surrounding areas.

B.12.103 The proposed development at WPF will provide up to 1,000 new dwellings on the site just south of Banbury Town centre. Applying a household size of 2.45 for the local area, it is inferred that the new dwellings delivered can support a population of approximately 2,450.

B.12.104 Further to this, the provision of community facilities, including a new primary school has the capacity to contribute to Cherwell and Banbury's attractiveness to young families.

Summary

B.12.105 The impacts of the new WPF will contribute a range of social and economic benefits to the area and will result in an increase in Cherwell's economic activity. It is therefore concluded that the development will have a positive and long-term impact.

Policy Framework Contributions

B.12.106 The development proposals at WPF will contribute positively to various national, regional and local policies. In a national context, the development will enable partners to contribute to the economic objectives of the government as articulated in the NPPF. This will be facilitated by providing housing, employment space and community infrastructure, and will help to deliver a sustainable community as a sustainable urban extension to Banbury.

National Planning Policy

B.12.107 A core planning principle of the National Planning Policy Framework is to "proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs" (para 17). The NPPF requires planning authorities to 'boost significantly' the supply of housing and stresses the importance of delivering a wide choice of high quality homes which meets local needs, delivered through high quality and inclusive design.

Regional Planning Policy

B.12.108 Regional planning guidance for this area is contained within the South East Plan, (SEP) which was adopted in May 2009, and provides a broad development strategy for the region until 2026 and makes provision for significant housing delivery. Policy H1 of the Regional Plan sets the housing target of 13,400 dwellings (670 per annum) for Cherwell District Council over the plan period (2006-2026). The South East Plan divides the district into two areas defined as "Central Oxfordshire" (6,400 homes) and "Rest of Oxfordshire" (7,000 homes).

B.12.109 The WPF development will make a significant contribution to delivering the housing trajectory as set out in the RSS.

Local Planning Policy

B.12.110 The adopted Cherwell Local Plan (adopted November 1996) still remains part of the statutory Development Plan for the area. A number of policies are still relevant and 'saved' until the Council's Local Development Framework, that will replace the adopted Cherwell Local Plan, is in place.

B.12.111 Whilst there are no policies that relate specifically to the site. There are a number of relevant 'saved' policies that relate to the Banbury area are: Policy H5 – Affordable Housing; Policy TR14 – Formation of new accesses to the inner relief road and Hennef Way, Banbury; Policy TR16 – Access Improvements in the vicinity of Banbury Railway Station; Policy R14 – Reservation of land for community buildings in association with housing developments at Hanwell Fields, Banbury; Policy C5 – Protection of ecological value and rural character of specified features of value in the district; Policy C15 – Prevention of coalescence of settlements; and Policy C34 – Protection of views of St Mary's Church, Banbury.

Emerging Local Plan Policy

B.12.112 The Cherwell Local Plan is currently at consultation stage, which recently closed. The date for submission to the Secretary of State of Communities and Local Government for public examination is not yet known.

B.12.113 Whilst the plan does not form part of the statutory development plan, it is a material consideration and provides an indication of the growth strategy for the district over a 20 year period. The Plan provides for an additional period of 5 years above the RSS provision, to cover a plan period 2006 to 2031. The annual RSS housing target of 670 has been rolled forward, to provide for 16,750 over the plan period. The Council has not yet formally determined its position on whether the 5% or 20% buffer is applicable.

B.12.114 The spatial strategy to manage growth within the district focuses the bulk of growth in and around Bicester and Banbury. Paragraph A.11 reads 'most of the growth in the district will be directed to locations within or immediately adjoining the main towns of Banbury and Bicester'. It is therefore clear that Banbury will make a substantial contribution in meeting the housing needs of the district. Policy BSC 1 sets out the district wide housing provision; Banbury to provide 4,352 homes over the plan period.

B.12.115 Policy BSC 2 aims for 40% of new homes to be delivered on brownfield land and new housing on brown and greenfield land to be provided at a density of no less that 30 dph. Central to this growth agenda is the creation of sustainable communities that meet the needs of a growing and ageing population, offering a high quality of life. Policy BSC 3 requires 30% affordable homes, 70% of which will be social rented/ affordable rented dwellings and 30% as other forms of intermediate affordable homes.

B.12.116 Para .127 recognises that mixed use strategic development sites delivering housing, services and facilities and contributions to local infrastructure are considered to be the most sustainable way of meeting Banbury's housing needs and addressing the issues facing the town.

Housing Land Supply

B.12.117 The 2011 Annual Monitoring Report (AMR), reported a housing land supply of 2.9 years, however an update to this position was prepared in April 2012 to inform a

Public Inquiry, revising the figure upwards to 3.1 years for the five year period 2012-2017. Cherwell District Council published a housing land supply briefing note in 14 August 2012, which confirms this position.

Cherwell District Council's Sustainability Appraisal of the Site

B.12.118 Whilst WPF is not allocated for development within the emerging Local Plan, the site was identified in the 'Options for Growth' document (September 2008), (BAN 4) which was a much more extensive site as an option for an area of planned growth of approximately 1600 dwellings. The site was considered as the following:

> *"Relatively close to the town centre, secondary schools, hospital and a superstore. Sufficient land to create a coherent neighbourhood and new local centre without unacceptable harm to landscape further south (Sor Brook Valley). Several access options: Broughton Road, south of Easington, Wykham Lane or Bodicote roundabout. Potential for coalescence (coming together) with Bodicote and for impact on landscape along Wykham Lane. This restricts the potential for southward, eastward and westward expansion."*

B.12.119 The site has therefore been assessed by the Council through its SA process and it was concluded the site could accommodate up to 1,600 homes witch is considerably higher than that which is proposed as part of the application. It is considered that the application is therefore in a suitable location and will contribute to the Councils policy objectives as well as making a considerable contribution to their 5 year housing land supply.

Summary

B.12.120 The review of the planning policy framework indicates that with regard to the impact of the contributions to local, regional and local policies for growth and housing delivery the proposals will be of a high magnitude and will help to deliver a number of the Districts policy objectives and contribute to Cherwell's current lack of a 5 year housing land supply. The impact of these receptors therefore is of major positive and long-term.

B.12.121 In the introduction to this chapter the range of potential other developments that may be considered in relation to this application were considered. The most

significant of these is the Crouch Farm site which lies adjacent to the WPF site which if granted consent would deliver a further 145 homes.

B.12.122The WPF site has been considered in relation to these proposals, although thy have not yet been consented. Whilst it is recognised that there will be an additional demand on resources with a further 145 households the WPF development has been designed to be sustainable and meet the needs of ifs future residents. Any additional demands that will be placed on services and facilities in the area will be mitigated by the developer contributions that will be made to the Council. It is therefore considered that the cumulative impact will be minor and short term.

Mitigation

B.12.123Taking into account the long term positive and neutral nature of impacts on the local economy it is considered that there is no requirement for mitigation measures in socio economic terms for these receptors. Any increases in the population that may cause pressures on local public services will be mitigated through contributions secured through a S106 agreement

Residual impacts

B.12.124The unavoidable impact of the development will be in relation to the additional population that will be generated by the additional 1,000 dwellings. However it is considered that any negative impacts will be adequately mitigated. The overall impacts will be positive and long term.

B.12.125The proposed development will bring forward a range of benefits in terms of reducing claimant count, diversifying the local economy and providing the communities with an increased housing supply and contributing to the districts 5 year housing land supply. This will be facilitated by providing the capacity for additional employment and 1,000 new homes which will increase the housing offer as well as providing affordable housing.

Conclusions

B.12.126The proposed development which is the subject of this assessment will have long term significant impact on the local economy. The proposals will primarily have the capacity to provide up to 1,000 new dwellings, will contribute to the housing/affordable housing needs as identified in the Councils housing needs assessment and will make a significant contribution to Cherwell's 5 year housing land

supply and their affordable housing needs as the development is likely to ensure significant provision of affordable units, despite the prevailing market conditions. This will contribute significantly to a key local priority.

B.12.127 The assessment of the socio economic impact of the outline application means assessing the appropriateness of the current facilities and provision in its ability to properly support the new population at WPF and deciding if there is a suitable balance between homes and jobs achieved on site. No long term adverse impacts are anticipated as a result of the application proposal.

B.12.128 The site will include new places of employment, a new primary school, local shops and community facilities which can be used by the planned residents of the site and those residents in the neighbouring settlement of Bodicote and Easington.

B.12.129 The mix of uses proposed will provide for the day to day needs for the residents and will reduce their need to travel. The design and land uses proposed will assist the WPF development in achieving its vision of being:

> *'A Sustainable Urban Extension of Banbury, fully linked and integrated into the fabric of the town whilst being of sufficient scale to meet its own distinct community, education and leisure needs. At the heart of the development will be a range of dwellings to meet the needs of all sections of the community, supported by a mix of associated employment space, retail, community and leisure uses. Development will be structured around and front onto a network of attractive streets, accessible open space and urban squares and will be of the highest standards of sustainable architectural and urban design quality. The site will be a sustainable development in all senses – environmentally, socially and economically.'*

B.13 SUSTAINABILITY AND CLIMATE CHANGE

Introduction

B.13.1 This chapter considers the approach to sustainability and potential impacts associated with climate change and how the proposed development is designed to adapt to /mitigate these impacts.

B.13.2 Proposals for the Wykham Park Farm development have been developed with sustainability as an integral part of the both the planning and design process. The development proposals support both national and regional sustainability objectives.

B.13.3 Sustainable development is defined as [34]:

'*Development which meets the needs of the present without compromising the ability of future generations to meet their own needs'*.

National Context

B.13.4 A new development strategy was formulated and published in 2005 entitled 'Securing the Future – The UK Sustainable Development Strategy'. The 2005 strategy, 'Securing the Future' sets out what the UK Government proposes to do in England.

B.13.5 A UK Strategic Framework for sustainable development was agreed between the UK Government and the Devolved Administrations of Scotland, Wales and Northern Ireland during consultation on the new UK Sustainable Development Strategy and was launched in conjunction with the UK Government Strategy. The Framework includes:

- A shared understanding of Sustainable Development;
- A vision of what is to be achieved and guiding principles to follow to achieve this;
- Sustainable Development priorities for the UK and Internationally;
- Indicators to monitor the key issues on a UK basis (A set of 198 National Indicators were implemented from April 2008).

[34] Government Annual Report 2001. *Achieving a Better Quality of Life: Review of Progress towards Sustainable Development*

B.13.6 The 2005 strategy updates and builds upon the 1999 strategy which identified four sustainability themes:

- Maintenance of high and stable levels of economic growth and employment;
- Social progress which recognises the needs of everyone;
- Effective protection of the environment; and
- Prudent use of natural resources.

B.13.7 The 2005 strategy outlines a 'purpose' statement agreed by the UK Government and Devolved Administrations which has become the new framework goal for sustainable development. It is recognised that a clearer, committed and integrated approach is required to achieve the goal of sustainable development.

B.13.8 The following set of five principles is how the Government expects to achieve the sustainability purpose and these form the basis of policy in the UK:

- Living within Environmental Limits;
- Ensuring a Strong, Healthy and Just Society;
- Achieving and Sustainable Economy;
- Promoting good Governance; and
- Using sound science responsibly.

B.13.9 Areas prioritised for action in the Strategy are:

- Sustainable consumption and production;
- Climate change and energy consumption;
- Natural resource protection and environmental enhancement; and
- To create sustainable communities.

B.13.10 As outlined in Section A, the National Planning Policy Framework (NPPF) was published in March 2012 and replaces former Planning Policy Statements (PPSs), Planning Policy Guidance Notes (PPGs) and some circulars into a single consolidated document. In the NPPF delivering sustainable development means:

- Planning for prosperity (**an economic role**) - topic-specific matters including business and economic development, transport, communications infrastructure, minerals;
- Planning for people (**a social role**) - topic-specific matters including housing, design, sustainable communities, Green Belt; and

- Planning for places (**an environmental role**) – topic -specific matters including Climate change, flooding and coastal change, Natural Environment and Historic Environment.

B.13.11 The policies contained within paragraphs 18 to 219 of the NPPF 'taken as a whole' are what the Government in England views sustainable development to mean in practice for the planning system.

B.13.12 Paragraph 14 of the NPPF places a presumption in favour of sustainable development. For decision taking this means approving development proposals that accord with the development plan without delay.

B.13.13 Paragraph 9 states that "pursuing sustainable development involves seeking positive improvements in the quality of the built, natural and historic environment, as well as in people's quality of life, including (but not limited to);

- Making it easier for jobs to be created in cities, towns and villages;
- Moving from a net loss of bio-diversity to achieving net gains for nature;
- Replacing poor design with better design;
- Improving the conditions in which people live, work, travel and take leisure; and
- Widening the choice of high quality homes.

B.13.14 Core planning principles within paragraph 17 include:

"*Proactively drive and support sustainable economic development to deliver the homes, businesses and industrial units, infrastructure and thriving local places that the country needs*".

"*support the transition to a low carbon future in changing climate, taking full account of flood risk and coastal change*...".

B.13.15 Section 10 also sets out Government Policy on "meeting the challenge of climate change, flooding and coastal change".

Local Context

Cherwell District Local Plan (1996)

B.13.16 The adopted Cherwell Local Plan (adopted November 1996) still remains part of the statutory Development Plan for the area.

B.13.17 The Local Plan seeks to protect, and where appropriate enhance the character, amenities and heritage of the District through rural and urban conservation and design considerations in new development.

B.13.18 Policy C1 states that:

"The council will seek to promote the interests of nature conservation. Development which would result in damage to or loss of sites of special scientific interest or other areas of designated wildlife or scientific importance will not normally be permitted. Furthermore, the council will seek to ensure the protection of sites of local nature conservation value. The potential adverse affect of development on such sites will be a material consideration in determining planning applications".

Emerging Local Plan (August 2012)

B.13.19 The Cherwell Local Plan is currently at consultation stage. The draft proposed submission is dated August 2012. Although the plan does not form part of the statutory development plan, it provides an indication of the growth strategy for the district over a 20 year period.

B.13.20 The Emerging Plan sets out the strategy for ensuring sustainable development including:

- *"Provide for new development that will bring with it new open space and recreation opportunities*
- *Plan new development in a way that will improve access to natural and semi natural green space and promote opportunities for new publicly accessible wooded areas*
- *Provide for new development in accessible locations which will provide good opportunities for improving and accessing public transport services, for delivering and using new cycleways, for travelling on foot and for minimising the impact on the highway network and traffic congestion*."

B.13.21 Policy ESD 1 (Mitigating and Adapting to Climate Change) states that:

"Measures will be taken to mitigate the impact of development within the district on climate change. At a strategic level, this will include:

- *Distributing growth development to the most sustainable location;*
- *Delivering development that seeks to reduce the need to travel and which encourages sustainable travel options including walking, cycling and public transport;*
- *Designing developments to reduce carbon emissions and use resources more efficiently;*
- *Promoting the use of decentralised and renewable or low carbon energy where appropriate.*

Key considerations in terms of climate change adaptation include:

- *Taking into account the known physical and environmental constraints when identifying locations for development.*
- *Considering design approaches that are resilient to climate change impacts including the use of passive solar design for heating and cooling*
- *Minimising the risk of flooding and making use of sustainable drainage methods, and*
- *Reducing the effects of urban 'heat islands' (through the provision of open space and water, planting, and green roofs, for example)."*

B.13.22 Policy ESD 2 (Energy Hierarchy) states that:

"In seeking to achieve carbon emissions reductions, we will promote an 'energy hierarchy' as follows:

- *Prioritise being LEAN - use less energy, in particular by the use of sustainable design and construction measures*
- *Then CLEAN - supply energy efficiently and give priority to decentralised energy supply, and*
- *Then GREEN - use renewable energy."*

B.13.23 Policy ESD 3 (Sustainable Construction) requires all new residential development to meet Code Level 4 of the Code for Sustainable homes and non-residential development to meet BREEAM 'very good'.

B.13.24 Policy ESD 4 (Decentralised Energy Systems) states that:

"The use of decentralised energy systems, providing either heating (District Heating (DH)) or heating and power (Combined Heat and Power (CHP)) will be encouraged in all new developments".

B.13.25 Policy ESD 7(Sustainable Drainage Systems (SuDS) requires that all new development will be required to use sustainable drainage systems (SuDS) for the management of surface water run-off.

Response of the development to national and local policies for sustainability

B.13.26 The proposals for the development of Wykham Park Farm have been developed with the objective of addressing as many local and national policies for sustainability as possible.

B.13.27 The Environmental Impact Assessment process as described in this Environmental Statement has identified a range of proposed measures to mitigate potential adverse environmental effects of the proposed development which both demonstrate the sustainability of the proposals and also contribute to the attainment of sustainability objectives.

B.13.28 Aspects of the proposed development which help the proposals to address the key local and national sustainability objectives and policies are described in this section of the ES.

Building in Sustainability

B.13.29 The key objective in the development of Wykham Park Farm therefore is to ensure that the mechanisms are in place to provide for the deliverability of those elements of the sustainability strategy. Such mechanisms as follows:

- Through the approval of a planning application for the whole development with those conditions and section 106 commitments that are necessary to the achievement of sustainability strategy put in place;

- Through the preparation of detailed design guidance for individual development parcels, to be approved by CDC and containing detailed sustainability requirements;
- Through the setting, monitoring and progressive refinement of the effectiveness of sustainability targets and strategies.

B.13.30 Key elements of ensuring that the proposed development will be sustainable are as follows:

- accessibility, travel and public transport provision will be sustainable;
- sound design principles will be incorporated into the development and will include measures to assist with adapting to and mitigating effects of climate change;
- conservation of the natural and cultural heritage and local distinctiveness will be promoted;
- a sustainable landscape strategy will be designed and implemented;
- sustainable drainage systems will be applied where possible and flood risk appropriately managed.

B.13.31 Such principles are in line with the requirements of the national sustainable development strategy "Securing the Future", the NPPF and Cherwell local context.

B.13.32 The Emerging Local Plan has been taken into consideration in the development of sustainable design codes, energy hierarchy (Policy ESD2), use of sustainable drainage (ESD7) and the provision of public transportation and access, although not all the requirements included have been considered as they are considered likely to change once the Local Plan is approved.

Accessibility, Travel and Public Transport

B.13.33 The likely significant effects of the scheme in terms of traffic, public transport, cycling and pedestrians are discussed in this ES in section B4. Additionally, a Transport Assessment (TA) and Travel Plan have been prepared as part of this ES.

B.13.34 The project provides pedestrian and cycle facilities within the site and links with Banbury's existing pedestrian and cycling network and will provide future residents to use these modes of transport.

B.13.35 The diversion of a local bus service into the site ensures that future residents will be within walking distance of bus services and encourage the use of public transport.

B.13.36 Local improvements to the Oxford Road network and the Bloxham Road / Queensway junction will help delays and congestion.

B.13.37 Through the delivery of junction improvements, it is ensured that the impact of the vehicle traffic generated is mitigated. The forecast scenarios (with committed traffic and development traffic) show that with the delivery of the improvements that the junctions operate with more capacity than in the base scenarios (only committed traffic).

B.13.38 The design of the `scheme in terms of road network and improvements ensure that the sustainability of the proposal.

Public Transport

B.13.39 The diversion of a local bus service into the site ensures that all new dwellings are within the recommended 400 metres of existing bus stops.

Walking and Cycling

B.13.40 A network of streets for pedestrian and cyclists is included in the design of the scheme. The proposed development will provide pedestrian / cycle links to the existing Saltway Cycle Route and a footway / cycle link on Bloxham Road linking pedestrians and cyclists with Banbury's existing pedestrian and cycle network and providing access to key facilities and services including the town centre, the railway station, employment areas and a foodstore.

B.13.41 The combined effect of the improved accessibility to the site, public transport and walking and cycling network will reduce reliance upon the private car and provide residents with sustainable modes of transport.

Local Employment

B.13.42 The proposed development includes a mix of associated employment space. The employment area is located within the western part of the site to provide both commercial profile and reduce the need for extraneous traffic to penetrate the site.

This generates employment opportunities within the site and the possibility for future local residents to work within walking distance of their houses.

B.13.43 This location also provides easy access from the proposed new junction off Bloxham Road into the site. The employment opportunities will be of a scale and type which suits the local need for jobs in the area, to contribute to achieving a balance between housing and jobs in a sustainable manner.

Ensuring quality, sustainable construction and adaptation/mitigation to climate change

B.13.44 The Wykham Park Farm development will incorporate good design principles. New residential properties will be developed following the requirements of Code Level 3 of the Code for Sustainable Homes.

B.13.45 The 'Code' provides a number of benefits for the environment of which include:-

- Reduced greenhouse gas emissions: The 'Code' has minimum standards for energy efficiency for each level of the 'Code', therefore providing a reduction in GHG to reduce the impact of climate change.
- Better adaptation to climate change: The 'Code' makes provisions to ensure future housing stock will be better adapted to cope with the inevitable impacts of climate change;
- Reduced impact on the environment overall: The 'Code' has the inclusion of measures to promote the use of less polluting materials, encourage household recycling to ensure future housing has fewer impacts on the environment.

B.13.46 The urban design principles for the development of the site have been informed by the latest urban design guidance. Building in sustainability will be an integral part of the development proposals. This will be achieved through:

- adoption of Sustainable Urban Drainage Systems (SuDs), where appropriate;
- implementation of strategies to reduce waste, including construction waste and to encourage recycling; and
- adoption of the Travel Plan to encourage sustainable modes of travel.

Conservation of the natural and cultural heritage and local distinctiveness promoted

B.13.47 The design has taken into account the existing features of ecological value and retained them where possible. The network of retained hedgerows will link with new structured landscape planting to maintain wildlife movement corridors around and beyond the application site.

B.13.48 Hedgerows and woodland which are retained will be managed to improve their nature conservation value and consideration will be given to increasing biodiversity of species within areas of public open space through use of native tree and shrub planting and wild flower seed mixes. Aquatic habitat will result through the creation of balancing ponds or other surface water attenuation features and SuDS.

B.13.49 An Ecological and Landscape Management Plan will be prepared for the site and will include measures to compensate for habitats lost and provide biodiversity enhancement measures to benefit local wildlife. The development will create amenity and community value in the landscape.

Landscape Strategy

B.13.50 The proposals include areas of public open space and strategic street planting which will contribute to the objective of providing a well-designed development which is an attractive environment for local residents.

B.13.51 An Ecological and Landscape Management Plan will be prepared for the site. The development will create amenity and community value in the landscape.

Sustainable Drainage Systems/ Flood Risk and Climate Change

B.13.52 Surface water runoff from the developed site will be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing flood risk and taking climate change into account.

B.13.53 It is a planning requirement to promote and use SuDS where possible as outlined in the NPPF, the local planning framework and the CIRIA C697 'SuDS Manual' (2007).

B.13.54 SuDs include above ground generally 'soft engineering' features and as a result can be financially, as well as environmentally, attractive engineering solutions. SuDS also

include below ground engineered systems such as porous paved, stone-fill and cellular storage systems. The surface water system will be designed to current best practice as set out in the Department of Environment Transport and the Regions "Sustainable Urban Drainage Systems Design Manual" (DETR, 2000), CIRIA C697 'SuDS Manual'.

B.13.55 The use of SuDS within the site should also lead to a reduction in peak flows to receiving waters, which enhances the settlement and biodegradation of pollutants, and an improvement in water quality treatment. Details of the proposed drainage strategy are included in the separate Flood Risk Assessment submitted with this planning application.

B.13.56 By implementing these inherent design measures within the site, impacts of the development on water quality, drainage and flood risk during operation will be negligible providing that they are maintained appropriately.

Summary

B.13.57 The proposed development will provide residential, employment and community facilities for the region.

B.13.58 The Wykham Park Farm development will incorporate good design principles. A Sustainability Statement will be prepared at the reserved matters stage to address the sustainable construction of the development.

B.13.59 Building in sustainability will be an integral part of the development proposals. This will be achieved through:

- adoption of Sustainable Urban Drainage Systems (SuDs), where appropriate;
- implementation of strategies to reduce waste, including construction waste and to encourage recycling; and
- adoption of the Travel Plan to encourage sustainable modes of travel.

B.13.60 At the reserved matters stage a Sustainability Statement will be provided and will address all matters as required.

B.13.61 An Ecological and Landscape Management Plan will be prepared for the site and will include measures to compensate for habitats lost and provide biodiversity

enhancement measures to benefit local wildlife. The development will create amenity and community value in the landscape.

C CONCLUSIONS

Introduction

C.1.1 The assessment of potential environmental effects of the proposed development in part B of the Environmental Statement identifies a range of both adverse and beneficial effects.

Land Use, Agriculture and Soils

C.1.2 The site area is approximately 50.31 ha. The proposal would result in the permanent loss of all the agricultural land (approximately 48ha) which is of best and most versatile quality, to built development. Additional areas becoming non agricultural due to the change in landuse. The permanent loss of best and most versatile quality agricultural land is considered a high adverse impact. Best and most versatile quality land is widespread in the area around Banbury.

C.1.3 Potential negative impacts could occur to topsoil quality (for example structure, nutrient status, organic activity) if handling, stockpiling and restoration is not carried out correctly. Wherever possible, soil resources would be retained on site for use in restoration, although limited resources may require removal for suitable use off site if a surplus is identified. Mitigating measures, however, would be adopted to reduce such potential impact and the significance of such impacts is therefore considered to be low to moderate adverse.

C.1.4 The significance of potential adverse impact upon agricultural drainage both on and off site is considered low to neutral, this would be controlled by appropriate drainage design for the proposed development.

Geology and Ground Conditions

C.1.5 The potential environmental impact with regard to ground conditions at the site has been assessed. The assessment has taken account of the potential for geotechnical and contaminative issues as a result of the existing ground conditions and as a result of the development of the site.

C.1.6 The desk study research has identified a low potential for soil contamination. Elevated concentrations of metals and metalloids, can be found in soils associated

with the Marlstone Rock Formation. The potential for soils contamination from the use of harmful pesticides is considered low.

C.1.7 The impact that the proposed development may have on the ground conditions has also been considered. There is potential for disturbance and contamination of the ground during and after the construction of the development at the site. The principal potential effect is during the building works at the site with the risk of chemical spillages and disturbance of the ground by construction plant.

C.1.8 The impact that the proposed development may have on the ground conditions has also been considered. There is potential for disturbance and contamination of the ground during and after the construction of the development at the site. The principal potential effect is during the building works at the site with the risk of chemical spillages and disturbance of the ground by construction plant.

C.1.9 It is likely that a detailed site investigation will be required to assess the ground conditions at the site and to better characterise the site in terms of the above issues.

C.1.10 It is considered likely that following analysis of the data from the site investigation works, any issues relating to the shallow and deeper ground conditions could be addressed during the development of the site. If the assessment of the geochemical results indicate contamination at the site, this could be addressed either using risk assessment or by removing the linkage between source and receptor, such as installing clean cover as a pathway break.

C.1.11 Detailed design of the development and management of the construction phase of the development will minimise the impact on the ground. This will include consideration of the hydrogeological regime at the site along with design to ensure that the development does not adversely affect the underlying strata. Management of the construction with appropriate materials handling and waste minimisation will also reduce the potential for impact on the ground.

Water Resources

C.1.12 Sor Brook is located 500m south of the southern site boundary. A tributary of the Brook flows from within the centre of the proposed development site, east toward Wykham Farm and then turns south to confluence with the Sor Brook approximately 500m off the south-eastern corner of the site. The Sor Brook is designated as Main River and is regulated by the Environment Agency (EA) . The section of drainage ditch within the site is anticipated to be unclassified but enforced by the Lead Local Flood Authority (LLFA) under the Land Drainage Act.

C.1.13 The Sor Brook has a regionally important potable water supply abstraction point on it at Adderbury and more locally registered abstractions for agricultural (spray irrigation) use and is therefore highly valued. There is also a consented Thames Water sewage discharge consented on Broughton Road within near vicinity of the site. The drainage ditch has no significant abstraction or discharge associated with it, with only a few minor domestic final effluent discharges associated with it. The watercourse within the site is not classified under the WFD. Water quality is likely to be typical of small watercourses receiving agricultural runoff.

C.1.14 During construction impacts may result from the release of sediment into the watercourses or the use of polluting materials on site such as cement and fuels. With appropriate mitigation and best practices employed during construction there is anticipated to be no significant effect upon any surface or groundwater.

C.1.15 The incorporation of SuDS techniques as part of the design process ensures that impacts during operation on flood risk and water quality from the development are reduced to an acceptable level, assuming these are maintained appropriately. The enhancement of the ditch and the application of the SuDS treatment train within the development means that there will be a net increase in open water across the site. The potential increase in downstream flood risk associated with the increase in impermeable surfaces associated with the development of the site is to be mitigated through the control of surface water runoff from the site to pre-development rates and through the use of on-site SuDS, including the use of swales and ponds/retention basins. This creates new water features within the environment and is a beneficial impact not only in terms of flood risk and water quality but also for ecological diversity.

C.1.16 The operation of the proposed mixed use development could significantly increase pressure on local water resources classed as being highly sensitive to abstraction and 'No Water Available' which would result in a major adverse significant effect. However this is based on the assumption that the development will be supplied by water locally. If Thames Water have planned for the future growth of Banbury and have improved the water supply and storage infrastructure to cater for future development, then the impact of the proposed development should be negligible, resulting in an effect of no significance.

C.1.17 Likewise the operation of the proposed development will place a significant loading on the comparatively small public sewerage system serving the Banbury catchment. At the time of writing this report TWUL is carrying out an Impact Study to determine if the sewerage system has sufficient capacity to receive the additional foul loadings and identify areas that will require upgrading. If off site improvement works to the public sewerage system are necessary then providing these are completed ahead of the development coming online, there should be a negligible adverse impact in terms of sewer flooding and on the quality of local watercourses (such as the Sor Brook and River Cherwell) receiving final effluent and combined sewer overflow spills. However as the Sor Brook is of major value then the resulting effect will be of minor adverse significance.

C.1.18 The assessment has concluded therefore that providing the recommended mitigation measures are adopted during the construction and operation of the proposed Wykham Park Farm development, there should be an adverse effect of minor significance on the water environment due to the negligible impact of the sewerage infrastructure on a receptor of major value).

Traffic and Access

C.1.19 Whilst measures have been designed to mitigate the effects of the Project there will be an inevitable overall increase in traffic levels compared with expected levels in 2017 and 2022. It is concluded in the TA that with appropriate mitigation measures the local network would have the capacity to absorb this without causing any detrimental effect. The site is located in a sustainable location with access by public transport, walking and cycling to a wide range of local services and facilities and offers good opportunities for travel by sustainable modes of transport. The design of the Project, the measures introduced to encourage cycling, walking and the use of

public transport and the proposed mitigation measures will mean that the Project will bring about a minor beneficial effect on the environment in terms of traffic and transport.

Air Quality and Dust

C.1.20 The construction phase assessment has been undertaken to determine the risk and significance of dust effects from earthworks, construction activities and trackout from the proposed development. The risk of dust effects is considered to be a low to high risk category (depending on distance from receptors) for earthworks and construction activities and a high risk category for trackout. Site specific mitigation measures will therefore need to be implemented at the site.

C.1.21 The significance of the dust effects has been assessed by taking into account the sensitivity of the local area and the risk that the activities might give rise to dust effects. The local area is considered to be of medium sensitivity. With the site specific mitigation measures outlined in Section B5 in place, the significance of dust effects for earthworks, construction and trackout are considered to be negligible.

C.1.22 To summarise, the air quality assessment indicates that the proposed development generated traffic will have a negligible impact on the majority of existing sensitive receptor locations in both 2017 and 2022. The impact at ESR 2 is considered to be 'slight benefial' due to the realignment of Bloxham Road. Although the impact on NO_2 concentrations at ESR 5 is classed as 'slight adverse', the increase with the development in place is so small that it is not considered to be significant. It is not therefore considered necessary to recommend measures to mitigate road traffic emissions.

C.1.23 The air quality assessment also predicted pollutant concentrations at two proposed sensitive receptor points within the proposed development.It is not therefore considered necessary to recommend measures to mitigate road traffic emissions.

Noise and Vibration

C.1.24 The activities carried out during the earthworks and construction phase of the development may have the potential to generate short term increases in noise levels above the recommended noise limits, set in accordance with current guidance, at existing sensitive receptors surrounding the site. The use of heavy plant associated

with the earthworks and construction works also has the potential to give rise to groundborne vibration.

C.1.25 With the implementation of best working practice and restriction on working hours, the noise and vibration impacts of earthworks and construction phases, will be generally be negligible, with only brief periods of minor adverse impacts likely.

Road Traffic Noise and Sensitive Receptors

C.1.26 The changes in road traffic noise due to the development generated traffic have been assessed at a number of both existing and proposed sensitive receptors. The assessment confirms that in accordance with the significance criteria included in this chapter, the increase in road traffic noise in 2017 and 2022 at the existing sensitive receptors CRTN2 to CRTN4 will be below the threshold of perception and is therefore considered to be negligible. Furthermore, results at receptor CRTN1 indicate that there is a perceivable drop in noise level due to the realignment of the A361 and the inclusion of the proposed junction. Mitigation measures are not therefore required.

Proposed Sensitive Receptors and Noise

C.1.27 The proposed noise sensitive areas of the development, i.e. the residential areas and primary school sites, will be subjected to noise from existing and proposed sources. The dominant source of existing noise at the sensitive areas of the proposed development is road traffic on the A361. In addition to the existing sources of noise, development generated vehicle movements on the local road network have the potential to increase noise levels across the proposed development.

C.1.28 A noise survey and noise modelling has been carried out to determine the noise levels, at the noise sensitive areas of the development, once operational. The results of the baseline noise survey and noise modelling indicate that the noise levels at the proposed development should not be a determining factor in granting planning permission in accordance with current guidance. However, mitigation measures will need to be incorporated into the site design to ensure that the required external daytime, and internal daytime and night-time noise levels, are achieved at residential areas and the proposed school sites.

Operational Noise and Sensitive Receptors

C.1.29 A detailed noise assessment will be required for each unit once the proposed activities are known. This will take into account actual levels of activity and plant and recommendations will be made for mitigation as appropriate.

Ecology and Wildlife

C.1.30 There are no international or national or other statutory designations on or adjacent to the site. The nearest site of nature conservation is the non-statutory site; Bretch Local Wildlife Site, which is situated approximately 1.2 km to the north-west of the site. Therefore no direct or indirect impacts are anticipated on this non-statutory designation as a result of the proposed development.

C.1.31 The majority of the site comprised arable land. The most notable ecological features are the network of hedgerows and associated ditches, woodland and mature/semi-mature trees.

C.1.32 The majority of the hedgerows will be retained within the proposed development, maintaining a network of wildlife corridors and continuity with open space and other retained habitats. Hedgerows and woodland which are retained will be managed to improve their nature conservation value and the areas of public open space will be enhanced through use of native tree and shrub planting and wild flower seed mixes. Aquatic habitat will result through the creation of small ponds and other surface water attenuation features and SuDS.

C.1.33 There will be direct loss of a stand of Douglas Fir however there will be new structure landscaping within the development which will compensate for this loss.

C.1.34 Retained habitats will be appropriately protected during construction works. The drainage schemes proposed will help prevent degradation in the water quality of the ditches. The cessation of agricultural production in the area is likely to improve the water quality in these watercourses.

C.1.35 Breeding birds and foraging bats use the site, in addition to other fauna such as badger and brown hare with limited habitat for amphibians, invertebrates and common reptiles. Measures are included to mitigate for the potential adverse

impacts on these groups and to provide new habitat within the site which will be beneficial to these species.

C.1.36 Residual impacts which will remain after mitigation will include an increased risk of predation on bats and birds by cats, increased risk of road mortality for wildlife entering roads, reduction in some bird species and brown hare populations within the site and beneficial impacts on bats, birds, invertebrates, amphibians, common reptiles and other wildlife species as a result of habitat creation and enhancement measures and improvement of water quality in the watercourses.

Landscape and Visual Impact

C.1.37 A landscape and visual impact assessment has been carried out, following current recommendations and guidance set out in the GLVIA, Second Edition, for a mixed use development on green field land south of Banbury.

C.1.38 The landscape value of the application site as a whole is considered to be:

- Landscape Sensitivity - Low/moderate overall, but increasing to high to the east towards Bodicote;
- Visual Sensitivity - Moderate with impacts primarily on users of Salt Way;
- Overall Sensitivity - Moderate apart from around Wykham Park, Wykham Farm (both listed) and the edge of Bodicote which are high;
- Value - Low, apart from farm settings and paths which are high.

C.1.39 It has been assumed that the development will be well and appropriately designed and detailed, topography will be altered as little as possible, the majority of the site's existing vegetation will be retained and strengthened, and include significant internal and peripheral tree planting including buffer corridors to boundary footpaths and low density and heavily planted development fronting rural boundaries.

C.1.40 With regard to significance, the development will cause a slight adverse landscape impact. This is because the proposals, although developing a previously undeveloped site, will retain the site's essential topography and the majority of its vegetation.

C.1.41 The site is generally discreet in the wider landscape, with significant views of the site restricted to close receptors. The main impacts on views will be from Salt Way,

Crouch Hill, site footpaths and Bloxham Road, where impacts will vary between moderate and severe adverse. The adverse impact on views could be reduced to neutral as planting matures, but visual impacts will remain severe, because the changes are so dramatic.

Archaeology and Cultural Heritage

C.1.42 It has been established that no statutory designations will be physically impacted upon by the proposals. However three Grade II Listed Buildings may experience setting impacts of slight to moderate adverse significance. These comprise Wykham Farmhouse (reference 1046877), and building ranges at Wykham Park (references 1283504 and 1391357).

C.1.43 In respect of buried archaeological remains it has been established that a potential exists for buried archaeological remains, in-particular prehistoric remains dating to the Iron Age and Neolithic periods, although remains dating to other periods cannot be ruled out.

C.1.44 As a consequence of the archaeological potential of the site a geophysical survey has been undertaken by Wardell Armstrong Archaeology and will be submitted as part of the planning application which this report supports. The results of the geophysical survey will, in consultation with the Development Control Archaeologist, inform on the necessity of further archaeological fieldwork. It is considered that this could be carried out as a condition to planning consent.

Waste and Recycling

C.1.45 There will be small adverse impact on the availability of landfill capacity, as a result of the disposal of non-recyclable wastes from the development. This impact will include a reduction in the total landfill space available for other wastes. Wastes materials from the development are likely to be disposed of to landfills in the local area with any residual hazardous materials taken further afield to adjoining counties. The impact is therefore likely to have effect at local or district scale rather than a regional level. As a result of the mitigation measures which will be applied, the impacts on local landfill availability are likely to be relatively minor overall. The use of landfill capacity for non-recyclable wastes from the development is not reversible and therefore will have a long-term impact on the overall availability of landfill capacity in the area.

C.1.46 With the planned projects in place it is anticipated that the impact of the proposed development on the County's ability to handle the recyclable and recoverable wastes generated by the proposed will be negligible.

Public Utilities and Services

C.1.47 It is anticipated that the arrangements for appropriate leels of supply to the proposed development can be achieved for all key services without significant impact on the environment.

Socio-Economic

C.1.48 The proposed development which is the subject of this assessment will have long term significant impact on the local economy. The proposals will primarily have the capacity to provide up to 1,000 new dwellings, will contribute to the housing/affordable housing needs as identified in the Councils housing needs assessment and will make a significant contribution to Cherwell's 5 year housing land supply and their affordable housing needs as the development is likely to ensure significant provision of affordable units, despite the prevailing market conditions. This will contribute significantly to a key local priority.

C.1.49 The assessment of the socio economic impact of the outline application means assessing the appropriateness of the current facilities and provision in its ability to properly support the new population at WPF and deciding if there is a suitable balance between homes and jobs achieved on site. No long term adverse impacts are anticipated as a result of the application proposal.

C.1.50 The site will include new places of employment, a new primary school, local shops and community facilities which can be used by the planned residents of the site and those residents in the neighbouring settlement of Bodicote and Easington.

C.1.51 The mix of uses proposed will provide for the day to day needs for the residents and will reduce their need to travel.

Sustainability and Climate Change

C.1.52 The proposed development will provide residential, employment and community facilities for the region.

C.1.53 The Wykham Park Farm development will incorporate good design principles. A Sustainability Statement will be prepared at the reserved matters stage to address the sustainable construction of the development.

C.1.54 Building in sustainability will be an integral part of the development proposals. This will be achieved through:

- adoption of Sustainable Urban Drainage Systems (SuDs), where appropriate;
- implementation of strategies to reduce waste, including construction waste and to encourage recycling; and
- adoption of the Travel Plan to encourage sustainable modes of travel.

C.1.55 An Ecological and Landscape Management Plan will be prepared for the site and will include measures to compensate for habitats lost and provide biodiversity enhancement measures to benefit local wildlife. The development will create amenity and community value in the landscape.

C.1.56 The design and land uses proposed will assist the WPF development in achieving its vision of being:

> *'A Sustainable Urban Extension of Banbury, fully linked and integrated into the fabric of the town whilst being of sufficient scale to meet its own distinct community, education and leisure needs. At the heart of the development will be a range of dwellings to meet the needs of all sections of the community, supported by a mix of associated employment space, retail, community and leisure uses. Development will be structured around and front onto a network of attractive streets, accessible open space and urban squares and will be of the highest standards of sustainable architectural and urban design quality. The site will be a sustainable development in all senses – environmentally, socially and economically.'*

Mitigation Measures

C.1.57 In each case where adverse environmental effects of the proposed development have been identified, measures to avoid or mitigate these effects have been identified and described. The principal mitigation measures included in the development proposals and recommended in the Environmental Statement are summarised in Table C1.1.

Residual Effects

C.1.58 The principal environmental effects of the proposed development after the implementation of the mitigation measures which have been identified and proposed, that is the "residual environmental effects" of the proposed development, are summarised in Table C1.2

Table C1.1 – Mitigation Measures Summary

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B1	Land Use, Soils and Agriculture	Loss of agricultural land (Grade 3a and 3b)	• The whole site will be removed from agriculture and therefore no mitigation will be required.
		Damage to soils during construction	• Removal of soils to be carried out in dry weather conditions and handled in accordance with MAFF 2000 document " Good Practice for Handling Soils' . • Preparation of a detailed soil handling strategy at detailed design stage.
		Loss of soils during construction operations	• Topsoil and strip soil to be stripped and stored separately in mounds. Topsoils require an oxygen supply and will be stored in low narrow bunds. If storage is longer than six months the stockpile will need to be seeded with a deep rooting grass to maintain soil structure and prevent the establishment of weed species. • Other measures will include; • the handling of all soils by low ground pressure bulldozer, 360° excavator and dumptruck; • minimising the number of machine movements across topsoil; • adoption of a bed/strip system for soil stripping, to minimise compaction; and • the definition of all site haul roads and storage areas. • Soils to be retained on site for use in garden and landscaped areas where possible. Any surplus soils to be removed off sie will be used for suitable use elsewhere (i.e. agricultural restoration, land reclamation, etc). These soils will be handled in accordance with appropriate techniques and in addition to the guidance in the soil handling strategy and guidance within the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (DEFRA 2009).
		Runoff from the development affecting agricultural land	• The use of appropriate cut-off trenches and temporary field drains during construction.

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B2	Geology and Ground Conditions	Accidental spillage or leaks on site	• Good management practices and preparation of a materials management plan prepared in accordance with latest guidelines including the Environment Agency guidelines such as 'Pollution Prevention Guideline No.6 Working at Construction and Demolition Sites'. • Mitigation to include storage of materials in secure locations and fuel stored in tanks which will be temporarily bunded with 110% of the tanks capacity.
		Introducing of or uncovering contaminants	• Detailed site investigation works. • Working Plan to allow excavations to be managed efficiently and mitigate any potential environmental impacts.
B3	Water Resources	Potential impacts on water quality during construction	• A Construction Environmental Management Plan (CEMP) will incorporate the water pollution prevention measures set out in the EA's Pollution Prevention Guidelines and CIRIA guidance documents (including *Control of Water Pollution from Construction Sites - A Guide to Good Practice*" will set out an emergency response plan in the case of a pollution incident. • The CEMP will define the pollution prevention methods for preventing entry of contaminants into water bodies. Measures to be addressed as part of the CEMP and construction contract documents to ensure that good practice is adopted are listed in paragraph B3.75 to B3.78 of Chapter B3 – Water Resources. • Management within the site by the contractor of surface water run-off from construction areas to ensure that construction activities do not impact upon SuDS constructed as part of the operational phase of the development.
		Potential impacts on water quality during operational phase	• Surface water runoff from the developed site will be managed in a sustainable manner using SuDS where possible. Surface water runoff from the development will be drained and discharged to ground using infiltration SuDS techniques subject to analysis of ground conditions at detailed design stage or if not conducive to a soakaway system then surface water runoff will be discharged to a nearly local watercourse at a runoff rate equivalent to pre-development runoff rate and to a public surface water sewer at a rate to be agreed with TWUL;

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B3 (cont)	Water Resources	Potential impacts on water quality during operational phase	• The existing minor ditch within the site is to be incorporated and improved within the site layout and a retention pond will be created to manage surface water flows.
B4	Traffic and Access	Construction Phase	• Deliveries to the site will be encouraged outside of peak hours to minimise effects of congestion, noise and local air pollution. • Construction Routing Agreements are likely to be made with OCC.
		Operational Phase *Bus measures* *Pedestrian and cycle measures* *Highway Measures* *Travel Plans*	• An existing bus service will be diverted into the site enabling all dwelling to be within 400m of a bus service. • Provision of high quality pedestrian and cycle facilities. • Street pattern within the site will be designed at the detailed design stage to meet the standards as set out within the DfT's Manual for Streets and other best practice design documents. • Traffic speeds will be carefully controlled by design to create a calm and safe environment. • New site access • Improvement to junctions to provide additional capacity • Extension of the 30 mph limit on Bloxham Road to south of the Bloxham Road/Wykham Lane junction • Relocation of the access to the existing Wykham Lane farmshop will remove majority of the traffic associated with this use from Wykham Lane resulting in beneifical impact on highway safety on Wykham Lane. • The requirements for the Travel Plans will be secured by condition and will be monitored by travel plan co-ordinators of the residential, employment and educational elements and by OCC.
B5	Air Quality	Construction Phase - Dust Emissions	• Preparation of a Best Practice Dust Management Plan will be in place for the duration of the construction phase of works which will set out practical measures to be implemented at the site. • The IAQM mitigation measures matrix identifies dust management measures that are considered applicable for low, medium and high risk sites.

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B5 (cont)	Air Quality	Construction Phase - Dust Emissions	• All dust and air quality complaints will be recorded and appropriate measures will be taken to identify causes and reduce emission in a timely manner. Exceptional incidents which cause dust and /or emissions and the action taken to resolve the situation will be recorded in a log book to be made available to the local authority on request. • During earthworks additional measures will be implemented to limit the generation of dust, which may include - Minimisation of the duration and amount of material handling use of appropriate materials handling methods; - Protection of surfaces and exposed material from winds until disturbed areas are sealed and stable; - Ensuring all vehicles are sheeted when loaded; - Dampening down of exposed stored material, which will be stored as far from sensitive receptors as possible; and • Avoidance of activities that generate large amounts of dust during windy conditions. • Mitigation measures will also be implemented to reduce the possibility of dust being generated through the trackout of mud and dirt onto the public highway. These may include; - Provision of a wheelwash; - Provision of easily cleaned hard standing areas for vehicles arriving at and leaving the site and parking; - Confining vehicles to areas of the site where appropriate dust control measures can be in operation; and - Minimisation of vehicle movements and limitation of vehicle speeds.
		Operational Phase – Road Traffic Emissions	• It is not considered necessary to recommend measures to mitigate road traffic emissions.

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B6	Noise	Construction Phase	Noise • working practice will be implemented during each phase of the earthworks and construction works at the site. The construction works will follow the guidelines in BS5228-1 and the guidance in BRE Controlling particles, vapour and noise pollution from construction sites, Parts 1 to 5, 2003. • The following measures will be put in place to minimise noise emissions: - When works are taking place within close proximity to those sensitive receptors identified, screening of noise sources by temporary screen may be employed; - All plant and machinery should be regularly maintained to control noise emissions, with particular emphasis on lubrication of bearings and the integrity of silencers. - Site staff should be aware that they are working adjacent to a residential area and avoid all unnecessary noise due to misuse of tools and equipment, unnecessary shouting and radios. - A further measure to reduce noise levels at the sensitive receptors would include, as far as possible, the avoidance of two noisy operations occurring simultaneously in close proximity to the same sensitive receptor. - Adherence to any time limits imposed on noisy works by the Local Authority. - Implement set working hours during the week and at weekends. - Ensure engines are turned off when possible. - Should earthworks/earthworks and construction activities need to be carried out during night-time hours, the local authority could include a planning condition which requests advance notice and details of any night working to provided. Vibration - Where reasonably practicable plant and or methods of work likely to cause significant levels of vibration at the receptors identified, should be replaced by less intrusive plant/methods of working.

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B6 (cont)	Noise	Construction Phase	- Vibration Isolation of plant at source: This may prove a viable option where the plant is stationary (e.g. a compressor, generator) and located close to a receptor. - Piling mitigation might include: use of alternative methods, removal of obstructions, provision of cut-off trenches, reduction of energy input per blow, reduction of resistance to penetration. Continuous flight augering would cause minimal vibration even very close to the piling operation. Noise The results indicate that the increase in road traffic noise at receptors CRTN1 to CRTN4 will not be significant. Mitigation measures are therefore not necessary for these receptor locations.
		Road Traffic Noise and Proposed Sensitive Receptors	• To meet the outdoor requirements of WHO 1999 during the daytime, i.e. 55dB $L_{Aeq\ 16hour}$, mitigation measures will need to be incorporated along the boundaries of the residential areas located immediately adjacent to the A361. • To reduce the level of road noise in the proposed outdoor living areas of the development, it is recommended that the following mitigation measures are considered for inclusion in the detailed site design: o The residential buildings proposed on the site, adjacent to the A361, could be constructed to act as a barrier themselves. For example a row of semi-detached properties at the boundary of the residential areas, located nearest to the A361 would protect properties further into the site. o Positioning of garden areas on the shielded side of buildings away from the A361. o Local mitigation measures, i.e. 1.8m to 2.0m high wall or close boarded fence, could be constructed at garden areas with a line of sight of the A361 and employment and local centre areas.

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B6 (cont)	Noise	Road Traffic Noise and Proposed Sensitive Receptors	• The implementation of the recommended glazing (refer to Mitigation Section B6) together with acoustic ventilation should ensure that the required internal daytime noise limits are met in those areas of the site where the external noise levels are greater than 55dB LAeq 16-hour. Alternatively, noise sensitive living areas could be positioned away from the A361 on the screened sides of buildings. • Noise attenuation schemes detailing the proposed glazing and ventilation requirements for residential dwellings in each area of the proposed development, on a plot by plot basis, can be submitted to CDC for review and approval at a reserved matters stage. • A detailed noise assessment will be required for each unit one the proposed activities are known. This will take into account actual levels of activity and plant; and recommendations will be made for mitigation as appropriate. • The mitigation measures required will depend on the location and the orientation of the proposed school buildings. For the purpose of this assessment, it is assumed that the proposed school building will be located in the southern, central part of the school site. To further reduce the levels of road traffic noise, it is recommended that a 2m high barrier be constructed along the northern boundary of the school site. • Noise attenuation schemes detailing the proposed mitigation measures to be implemented, to ensure the external noise limits are achieved at the school development sites, can be submitted to CDC for review and approval at a reserved matters stage. • Noise attenuation schemes detailing the proposed glazing and ventilation requirements for proposed school sites of the proposed development can be submitted to CDC for review and approval at a reserved matters stage.
		Operational Employment Noise and Sensitive Receptors	• A detailed noise assessment will be required for each employment unit once the proposed activities are known. This will take into account actual levels of activity and plant and recommendations will be made for mitigation as appropriate.

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B7	Ecology and Widlife	Construction/ Operational Phases	• To retain as far as possible a continuity of retained habitats within the proposed development, 88% of the hedgerows within the site will be retained. • Within the development retained hedgerows will be associated with roads or will be adjacent to areas of public open space. They will not form rear or side boundaries of development where appropriate maintenance cannot be provided. • Appropriate management of retained hedgerows will be instigated so as to maximise their value to birds and other wildlife. • Pedestrian and cycle access points with the Salt Way will be aligned with existing gaps in the hedgerow. • Enhancement works for hedgerows will comprise measures as outlined in paragraph B7.281 of Chapter B7. • Excavations near retained trees and hedgerows will be undertaken in accordance with BS5837:2012 – Trees in relation to construction. • Approximately 298m of hedgerow will be created within the development in addition to new landscape buffers and street planting which will compensate for the loss of 520m of hedgerows to the development. • New hedgerows will comprise species of local provenance and will include a mixture of hawthorn, blackthorn, elder, field maple, dog-rose, field rose and hazel. Species of standard trees to be planted will include pendunculate oak, sweet chestnut and Scots pine. • Landscape buffers will be provided adjacent to the Salt Way and Bloxham Road and will include tree and shrub planting (refer to Mitigation Section of Ecological Chapter B7). Street tree planting will also be undertaken. A programme of advanced planting will be instigated in these areas to provide a mixed aged planting. New planting will provide additional tree and hedgerow habitat and connectivity within the site.

Section Number	Topic Area	Environmental Impact	Mitigation Measure

B7 (cont)	Ecology and Widlife	Construction/ Operational Phases	• An Ecological and Landscape Management Plan will be produced to set out short and long-term management specifications for habitats on site. It will include the following prescriptions:
			  • Appropriate mowing regime, possibly once in early March and once in late September, with cuttings removed to retained stressed conditions and reduce the competitiveness of grasses;
			  • Lack of fertiliser input to retain a low nutrient status, which will discourage competitive species;
			  • Monitoring of the condition of the grassland on an annual basis and continued reassessment of management requirements.
			• The semi-natural broad-leaved woodland in the north-west of the site will be enhanced for biodiversity. A glade will be created within the woodland with selective thinning of trees undertaken as appropriate. Woodland flora planting will also be undertaken using an appropriate seed-mix e.g. Emorsgate Seed Mix EW1.
			• Environmental Agency's Pollution Prevention Guidelines (PPGs) will be followed to prevent any pollution event affecting drainage ditches and other adjacent habitats.
			• Measures will be included in a Construction Environmental Management Plan for the site to prevent pollutants and sediments entering ditches and watercourses downstream described in Section B3.
			• SuDs techniques are incorporated into the design process including the use of swales and retention basins to ensure that impacts during the operation on water quality from the development are reduced to an acceptable level. Up to three smaller ponds will be created for biodiversity.
			• Marginal and aquatic planting will be undertaken in the wetland areas to enhance their value for biodiversity. A net increase in open water within the development will create potential opportunities for a range of wildlife.

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B7 (cont)	Ecology and Widlife	Construction/ Operational Phases	• An appropriate seed mix, e.g. Emorsgate Seed Mix EM1 – Pond Edge Mixture), will be planted around the ponds and a range of aquatic species which are of value for amphibians as egg-laying plants (refer to ecological mitigation section B7). • Wildflower meadow planting will be undertaken in the more informal areas of public open space. These areas will be sown with an appropriate wildflower mix, such as Emorsgate Seed Mix EM1. • Bulb planting will also be undertaken in these areas in order to provide early nectar sources for invertebrates (refer to ecological mitigation section B7 for species). • If great crested newts are found to be present in Pond P6 and there is significant ground disturbance within the part of the site close to Pond P6, then it may be necessary to apply for a disturbance licence from Natural England to carry out mitigation measures for this European Protected Species under the Conservation of Habitats and Species (Amendment) Regulations 2012. • Mitigation measures in this case would include the capture and exclusion of great crested newts from areas of suitable habitat within the site, where these are located within and/or up to 500m of Pond P6. The exclusion and capture of GCN from the parts of the site affected would involve the use of exclusion fencing and pitfall traps and would be undertaken in accordance with the relevant Natural England guidance. An area within the proposed development site would be designated as a receptor site for captured amphibians and habitat creation and enhancement measures would be implemented such as the creation of hibernacula and new aquatic habitat, also following Natural England guidance. • Mitigation for badgers is detailed in a confidential Appendix B7.4.

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B7 (cont)	Ecology and Widlife	Construction/ Operational Phases	• Prior to any tree felling or tree surgery as part of the development, trees will be re-assessed for their current bat roost potential, and , if individual trees are assessed as having high bat roost potential, these trees will be subject to either a detailed inspection by a licensed bat-worker or emergence/re-entry surveys to determine whether a roost is present. If bats or evidence of bat occupation is found then it will be necessary to apply for a disturbance licence from Natural England to carry out mitigation and compensation measures (e.g. erection of new bat boxes and relocation of any bats found). • Bat-boxes will be erected in the semi-natural broad-leaved woodland in the north-west of the site and on suitable mature trees in the retained hedgerows. (refer to Ecological Mitigation Section B7 for specifications). The provision and locations of these bat boxes will need to be considered at the detailed planning stages and could be a way in which house builders could achieve ecology credits under the Code of Sustainable Homes assessment. • Street and security lighting will be positioned so that light is directed away from bat flight-lines across the site. The lighting specification will be selected to have the least impact on bats. • The lighting scheme will also aim to maintain dark movement corridors along the periphery of the site to minimise impacts on bat species which are more sensitive to lighting. • Wooden planks will be placed in any excavations to be left open overnight to provide a means of escape for any mammals which may enter the excavations. • Where it is possible, clearance of vegetation will be removed outside of the breeding season, i.e. between 1st September and 29th February. Pre-clearance checks for birds by an ecologist will be undertaken if it is necessary to clear vegetation outside of this time period.

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B7 (cont)	Ecology and Widlife	Construction/ Operational Phases	• It is proposed that nine nest-boxes, including three nest-boxes with 26mm holes, three nest-boxes with 32mm holes and three open front nest-boxes will be erected in the woodland in the north-west of the site. A total of eighteen nest-boxes, including six nest-boxes with 26mm holes, six nest-boxes with 32mm holes and six open front nest-boxes will be erected on suitable trees and shrubs in the retained hedgerows. • The provision and locations of nest-boxes will need to be considered at the detailed planning stages and could be a way in which Housebuilders could achieve ecology credits under the Code of Sustainable Homes assessment. • A method statement will be prepared which will detail measures that can be undertaken during the construction works which will minimise and prevent harm to any common reptile i.e. grass snake that might be present at the time of the construction works. The method statement for the site can be covered under an appropriate planning condition. • Two hibernacula for reptiles will be constructed. One will be located near where the grass snake was observed in an existing hedgerow along the northern boundary of the site and one will be located near the surface water attenuation features. • The Ecology and Landscape Management Plan will include for placing some grass cuttings from the mowing of amenity grassland in areas of structure landscaping/retained hedgerows to provide potential egg-laying sites for grass snake.
B8	Landscape and Visual Impact	Construction/ Operational Phases	Mitigation measures could include: • Keeping groundworks to a minimum by locating large footprint landuses on the most level areas and so retain the site's essential topography; • Siting high density, more urban and active type developments away from Salt Way and, in order to protect farm settings, the southern boundary; • Retaining and strengthening all internal hedges, using existing gaps for access where possible,

Section Number	Topic Area	Environmental Impact	Mitigation Measure
			retaining all boundary vegetation and strengthening that to the east and west;
B8 (cont)	Landscape and Visual Impact	Construction/ Operational Phases	• Maintaining an open space buffer to the south of Salt Way; • Providing a landscape corridor for the footpath on the western boundary; • Undertaking significant site wide tree and shrub planting including small woodland blocks, to break up the development mass and help assimilation with the wider landscape; • Undertaking significant planting around the Bloxham Road roundabout; • Protecting and reinforcing existing links to Salt Way and providing a network of links throughout the development; • use of appropriate materials, colours and architectural articulation, to break up overall size and shape, avoiding uniform colours and extensive unbroken elevations and roof lines and • limiting unnecessary commercial and highway lighting.
B9	Archaeology and Cultural Heritage	Construction/ Operational Phase	• Development proposals have been tailored to allow preservation in situ of archaeological remains in the two eastern-most fields within the site boundary. • Within the remainder of the site there is no evidence to suggest the presence of remains of greater than medium importance. Therefore it is considered that the potential adverse impacts to buried archaeological remains within the central and western parts of the site could adequately be mitigated through a programme of archaeological fieldwork carried out as a condition to planning consent.
B10	Waste and Recycling	Construction Phase	• A Site Waste Management (SWMP) will be produced as required/ in accordance with the Site Waste Management Plan Regulations 2008. • The developer/agent will liaise with the appropriate authorities on design, location of waste storage and collection facilities during the construction phase of the development. • All waste produced during construction operations at the site will be stored in designated areas and isolated from the surface water drainage system.

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B10 (cont)	Waste and Recycling	Construction Phase	• Skips will be covered to prevent wind blown debris and replaced when full by conventional waste collection contractors. Recyclable wastes and specialist packaging will be collected on site and sent for recycling and utilised on site, where practicable. • Excavation spoil will be utilised wherever possible within the proposed development scheme for a beneficial use. If this is not possible, every effort will be made to recycle or reuse it elsewhere within Oxfordshire.
		Operational phase	• The developer/agent will liaise with the appropriate authorities on design, location of waste storage and collection facilities during the operational phase of the development. • Detailed design of the individual parts of the development will take into account relevant guidance when considering waste management. • Skips will be covered to prevent wind blown debris and replaced when full by conventional waste collection contractors. Recyclable wastes and specialist packaging will be collected on site and sent for recycling and utilised on site, where practicable. Businesses will have to arrange a contract with the Council or other commercial waste contractor to suit their needs and to identify the waste streams they produce and establish possibilities for waste minimisation and identify recycling opportunities. New businesses will have to confirm as part of the Waste (England and Wales)(Amendment) Regulations 2012 that they have applied the waste hierarchy when transferring waste and require separate collection of waste paper, metal, plastic and glass from 1st January 2015.
B11	Public Utilities and Services	Operational Phase	• Extension of services to serve the site.
B12	Socio-Economic Impacts	Impact on local economy and community services	• Any increases in the population that may cause pressures on local public services will be mitigated through contributions secured through a S106 agreement

Section Number	Topic Area	Environmental Impact	Mitigation Measure
B13	Sustainability and climate change	Impacts during construction and operation of development	• Preparation of a Sustainability Statement at reserved matters stage.

Table C1.2 – Environmental Residual Impacts Summary

Topic Area	Description of impact	Geographical level of Importance of Issue					Impact	Duration	Significance of residual effects
		I	N	R	D	L			
B1 Land use, Agriculture and soils	Loss of agricultural land of ALC grade 2 and subgrade 3a.		N				Adverse	Lt, IR	Not significant
	Damage to soils during construction operations					L	Adverse	Lt, IR	Minor
	Loss of soils during construction operations					L	Adverse	Lt, IR	Minor
B2 Geology, and Ground Conditions	Human (construction)					L	Adverse	St, R	Negligible
	Human (occupation)					L	Adverse	Lt, IR	Negligible
	Surface water				D		Adverse	Lt, IR	Negligible
	Ground water				D		Adverse	Lt, IR	Negligible
	Built development					L	Adverse	Lt, IR	Negligible
B3 Water Resources	Sediment pollution from construction activities					L	Adverse	St, IR	Moderate
	Release of contaminating materials during construction					L	Adverse	St, IR	Moderate
	Increased overland flow increasing flood risk within the site during construction					L	Adverse	St, R	Major
	Polluting materials from the development (i.e. vehicle movements etc)					L	Adverse	Lt, R	Moderate
	Decreased input of nutrients as land no longer used for agriculture					L	Beneficial	Lt, R	Minor
	Creation of Preferential pathways and derogation of water quality					L	Adverse	Lt, R	Moderate
	Increased loading of foul flows on public sewerage system				D		Adverse	Lt, R	Minor
	Increased pressure on limited water resource if sourced locally				D		Adverse	Lt, IR	Major
	Extension and enhancement of new ditch/watercourse/Swale					L	Beneficial	Lt, R	Minor

Topic Area	Description of impact	Geographical level of Importance of Issue					Impact	Duration	Significance of residual effects
		I	N	R	D	L			
B4 Traffic and Access	Local Road Network – Construction traffic potential disruption during off-site highway/site access improvements					L	Adverse	St, R	Minor to Negligible
	Travel by public transport and sustainable modes				D		Beneficial	Lt	Moderate
	Highway improvements				D		Beneficial	Lt	Moderate
	Public Rights of Way					L	Adverse	St, Rv	Moderate-Major
	Increase in Vehicle movements on local highway				D	L	Adverse	Lt, IR	Negligible
B5 Air Quality	Dust and air emissions during construction					L	Adverse	St, R	Negligible
	Post construction effects on human health from air emissions					L	Adverse	Lt, IR	Negligible significant
B6 Noise and vibration	Construction noise and vibration – Noise from Enabling Works and Construction					L	Adverse	St, R	Moderate
	Effects of changes in road traffic noise levels at sensitive receptors in the vicinity					L	Adverse	Lt, IR	Minor – Negligible
	Employment and building plant noise					L	Adverse	Lt,R	Minor
	Post construction effects of road traffic on proposed development					L	Adverse	Lt, IR	Minor
B7 Ecology and Wildlife	Habitat Loss - Arable					L	Adverse	Lt, IR	Negligible
	Habitat Loss - Hedgerows					L	Adverse	Lt, R	Negligible
	Habitats loss – Mature trees					L	Adverse	Lt, R	Negligible
	Indirect effects - Woodland					L	Adverse	Lt, R	Minor
	Hedgerow / Landscape planting					L	Beneficial	Lt, R	Minor
	Indirect effects on water quality -ditches					L L	Adverse if pollution event Beneficial –	St, R Lt, R	Minor – Major At least minor

Topic Area	Description of impact	Geographical level of Importance of Issue					Impact	Duration	Significance of residual effects
		I	N	R	D	L			
							improved water quality		
B7 Ecology and Wildlife (cont)	Creation of ponds/wetland habitat					L	Beneficial	Lt, R	Minor
	Amphibians – loss of foraging habitat/ harm/ disturbance					L	Adverse	Lt, R	Minor
	Creation of ponds and hibernacula					L	Beneficial	Lt, R	Minor
	Badgers – direct/indirect					L	Adverse	Lt, R	Minor – Moderate
	Bats – roosts					L	Adverse	Lt, R	Minor – Major
	Loss of foraging/ flightlines					L	Adverse	Lt, R	Minor
	Increased predation from cats					L	Adverse	Lt, IR	At least minor
	Birds – loss of breeding sites/ disturbance					L	Adverse	Lt, R	Minor
	Loss of feeding habitat					L	Adverse	Lt, R	Minor
	Increased predation by cats					L	Adverse	Lt, IR	At least minor
	Brown hare – loss of foraging /disturbance					L	Adverse	Lt, IR	Minor - Moderate
	Invertebrates					L	Adverse – if pollution event	St, R	Minor
						L	Beneficial	Lt, IR	At least minor
	Reptiles – loss of limited habitat					L	Adverse	Lt, R	Minor
	Harm / disturbance								

Topic Area	Description of impact	Geographical level of Importance of Issue					Impact	Duration	Significance of residual effects
		I	N	R	D	L			
B8 – Landscape and Visual Impacts	Visual impacts - appropriate planting along the Salt Way and Bloxham Road					L	Adverse	Lt, R	Moderate
	Replacement Structural landscape planting within proposed development					L	Beneficial	Lt, R	Moderate
	Views from public footpaths					L	Adverse	Lt, IR	Major
	Visual Impact				D	L	Adverse	Lt, IR	Minor – Major
B9 Archaeology and Cultural Heritage	Damage to/loss of potential buried remains	U	U	U	U	U	Adverse	Lt, IR	To be confirmed by archaeological evaluation
	Setting of listed buildings		N	R			Adverse	Lt, R	Minor - Moderate
	Retention of hedgerows					L	Beneficial	Lt	Minor
	Information			R			Beneficial	Lt	Moderate
B10 Waste and Recycling	Disposal of waste during construction				D		Adverse	Lt, IR	Minor
	Disposal of waste from the completed development				D		Adverse	Lt, IR	Minor
B11 Public Utilities and Services	Impacts on existing services					L	Adverse	Lt, IR	Minor
B12 Socio Economic	*Construction Stage Impacts*								
	Employment				D	L	Beneficial	ST	Major
	Economic				D	L	Beneficial	ST	Minor
	Operational Stage Impacts								
	Housing – 1,000 dwellings			R	D	L	Beneficial	Lt	Major
	Demographics – 1,000 new households				D	L	Beneficial	Lt	Minor
	Economic impacts				D	L	Beneficial	Lt	Major
	Demand on Healthcare Facilities				D	L	Neutral	St	Minor
	Demand on Education provision				D	L	Beneficial	Lt	Minor

Topic Area	Description of impact	Geographical level of Importance of Issue					Impact	Duration	Significance of residual effects
		I	N	R	D	L			
	– Early Years								
B12 Socio Economic	Demand on Education provision – Primary Schools				D	L	Beneficial	Lt	Major
	Demand on Education provision – Secondary Schools				D	L	Adverse	St	Major
	Provision of and Demand on Community Facilities				D	L	Beneficial	Lt	Minor
	Current provision and demand on open space				D	L	Beneficial	Lt	Minor
	Contribution to National Regional and Local Planning Objectives		N	R	D	L	Beneficial	Lt	Major
	Cumulative Impact – Demand on services/facilities					L	Adverse	St	Minor
B13 Sustainability and Climate Change	Meeting National Targets for sustainability				D	L	Beneficial	Lt, IR	Moderate

KEY

I = International
N = National
R = Regional
D = District
L = Local
U= Unknown

St = Short term
Lt = Long term
Rv = Reversible
IR = Irreversible