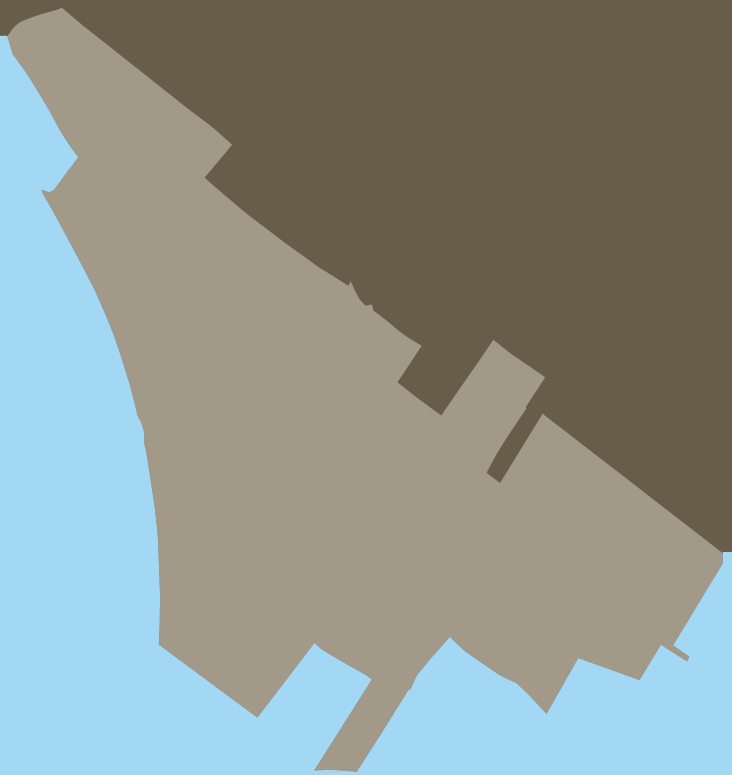

NORTH WEST cambridge

Environmental Statement Non-Technical Summary

March 2012

Alconbury
Little Stukeley
Great Stukeley
Kings Ripton
Oldhurst
Woodhurst
Colne
Earith
Bluntisham
Hill Row Doles
Haddenham
North Hill
Wilburton
Aldreth
Little Thetford
Stretham
Barway
Broad Hill
Isleham Fen
Isleham
Isleham Marina
Thistley Green
West Row
Mildenhall
Worlington
Barton Mills
HUNTINGDON
Houghton
Hartford
Hemingford Abbots
Hemingford Grey
ST IVES
Needingworth
Holywell
Over
Willingham
Smithey Fen
Soham
Soham Mere
Wicken
Fordham
Chippenham
Freckenham
Red Lodge
Tuddenham
Herringswell
Brampton
GODMANCHESTER
Buckden
Grafham
Fenstanton
Fen Drayton
Swavesey
Longstanton
Rampton
Cottenham
Chittering
North Fen
Denney Abbey
River Bank
Adventurers Fen
Upware
Landwade
Burwell
Kennett
East Perry
Diddington
Offord Cluny
Offord D'Arcy
Hilton
Huntingdon Services
Conington
Cambridge Services
Boxworth
Oakington
Westwick
Landbeach
Waterbeach
Clayhithe
Reach
Exning
Newmarket Services
Moulton
Gazeley
Southoe
Papworth St Agnes
Graveley
Papworth Everard
Elsworth
Lolworth
Knapwell
Bar Hill
Histon
Impington
Milton
Horningsea
Anglesey Abbey
Lode
Swaffham Prior
Swaffham Bulbeck
Commercial End
Newmarket Heath
NEWMARKET
Ashley
Dalham
Denham Castle
Little Paxton
Great Paxton
Toseland
Yelling
Dry Drayton
Girton
Chesterton
Fen Ditton
Stow cum Quy
Bottisham
Cheveley
Broad Green
Saxon Street
Ousden
Weston
ST NEOTS
Duloe
Eaton Socon
Eynesbury
Caxton Gibbet
Croxton
Eltisley
Caxton
Cambourne
Highfields
Hardwick
Madingley
Coton
CAMBRIDGE
Teversham
Little Wilbraham
Great Wilbraham
Stetchworth
Dullingham
Woodditton
Ditton Green
Lidgate
Upend
Kirtling
Kirtling Green
Abbotsley
Little Barford
Great Gransden
Little Gransden
Longstowe
Bourn
Caldecote
Toft
Comberton
Barton
Grantchester
Cherry Hinton
Fulbourn
Six Mile Bottom
Westley Waterless
Burrough Green
Brinkley
Thorns
Wickhambrook
Cowlinge
Waresley
Tempsford
Gamlingay
Hatley St George
Kingston
Great Eversden
Little Eversden
Radio Astronomy Observatory
Haslingfield
Harlton
Harston
Hauxton
Trumpington
Gog Magog Hills
Wandlebury
Great Shelford
Stapleford
Little Shelford
Lark Hall
West Wratting
Weston Colville
Carlton
Weston Green
Great Bradley
Little Bradley
Little Thurlow
Great Thurlow
SANDY
Everton
Potton
Cockayne Hatley
East Hatley
Wimpole Hall
Arrington
Croydon
Wimpole
Orwell
Barrington
Shepreth
Newton
Foxton
Babraham
Sawston
Little Abington
Great Abington
Pampisford
Whittlesford
Hildersham
Linton
Balsham
West Wickham
Withersfield
Great Wratting
Little Wratting
Horseheath
Haverhill
Kedington
Hanchet End
Barnardiston
Hundon
Hatch
Beeston
Upper Caldecote
Sutton
Wrestlingworth
Eyeworth
Tadlow
Wendy
Whaddon
Shingay
Meldreth
Dyer's Green
Kneesworth
Melbourn
Thriplow
Fowlmere
Duxford
Chapel
Hinxton
Ickleton
Stump Cross
Great Chesterford
Little Chesterford
Bartlow
Shudy Camps
Castle Camps
Hadstock
Steventon End
Camps End
Church End
Ashdon
Little Walden
Helions Bumpstead
Steeple Bumpstead
Sturmer
Stoke by Clare
Baythorne End
BIGGLESWADE
Guilden Morden
Dunton
Abington Pigotts
Bassingbourn
Litlington
Steeple Morden
Edworth
Hinxworth
Ashwell
Langford
Broom
ROYSTON
Chrishall Grange
Flint Cross
Heydon
Great Chishill
Little Chishill
Chrishall
Elmdon
Strethall
Littlebury
Audley End
SAFFRON WALDEN
Sewards End
Radwinter
Red Oaks Hill
Hempstead
Cornish Hall End
Birdbrook
Ridgewell
Stambourne Green
Stambourne
Toppesfield
Robinhood End
Clifton
Henlow
Astwick
Church End
Arlesey
Stotfold
Radwell
Newnham
Bygrave
Caldecote
Baldock Services
Therfield
Barley
Newsells
Shaftenhoe End
Reed
Barkway
Nuthampstead
Kelshall
Sandon
Pond Street
Duddenhoe End
Langley
Bridge Green
Littlebury Green
Wendens Ambo
Wimbish
Wimbish Green
Great Sampford
Carver Barracks
LETCHWORTH
BALDOCK
Newport
Lower Green
Arkesden
Icknield Way
ROMAN ROAD
A1
A14
A141
A1123
A1198
A428
A1303
A603
A1134
A1301
A10
A11
A505
A1307
A1017
A143
A1092
A142
A1065
A1304
A507
M11
B1040
B1050
B1049
B1102
B1104
B1085
B1506
B1063
B1061
B1046
B1042
B1368
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B1383
B184
B661
B1043
B658
B659

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Pegasus Planning Group

UNIVERSITY OF CAMBRIDGE

Ref: U.0104.63
Date: September 2011

Introduction

The University of Cambridge (the "Applicant") is seeking to obtain planning permission for a mixed use development (the "Proposed Development") on land to the north-west of Cambridge, Cambridgeshire (the "Application Site").

The Application Site is situated astride the administrative boundary of South Cambridgeshire District Council (SCDC) and Cambridge City Council (CCC). The location of the Application Site is shown on Figure 1 and the extent of the Application Site is shown on Figure 2.

This document provides a non-technical summary (NTS) of the Environmental Statement (ES). The ES presents the findings of the Environmental Impact Assessment (EIA) which has been undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (the "EIA Regulations") and in conjunction with the design process for the Proposed Development and various supporting studies, which have informed the design.

The full findings of these studies and of the overall ES are presented in a comprehensive set of documents that can be viewed at the offices of SCDC and CCC. Additional copies of the NTS (no charge), ES Volume 1 (£50 plus postage), ES Volume 2 Figures (£50 plus postage), and ES Volume 3 the Technical Appendices (£150 plus postage), are available from:

Pegasus Planning Group,

Pegasus House,

Querns Business Centre,

Whitworth Road,

Cirencester,

Gloucestershire,

GL7 1RT.

Telephone: 01285 641717

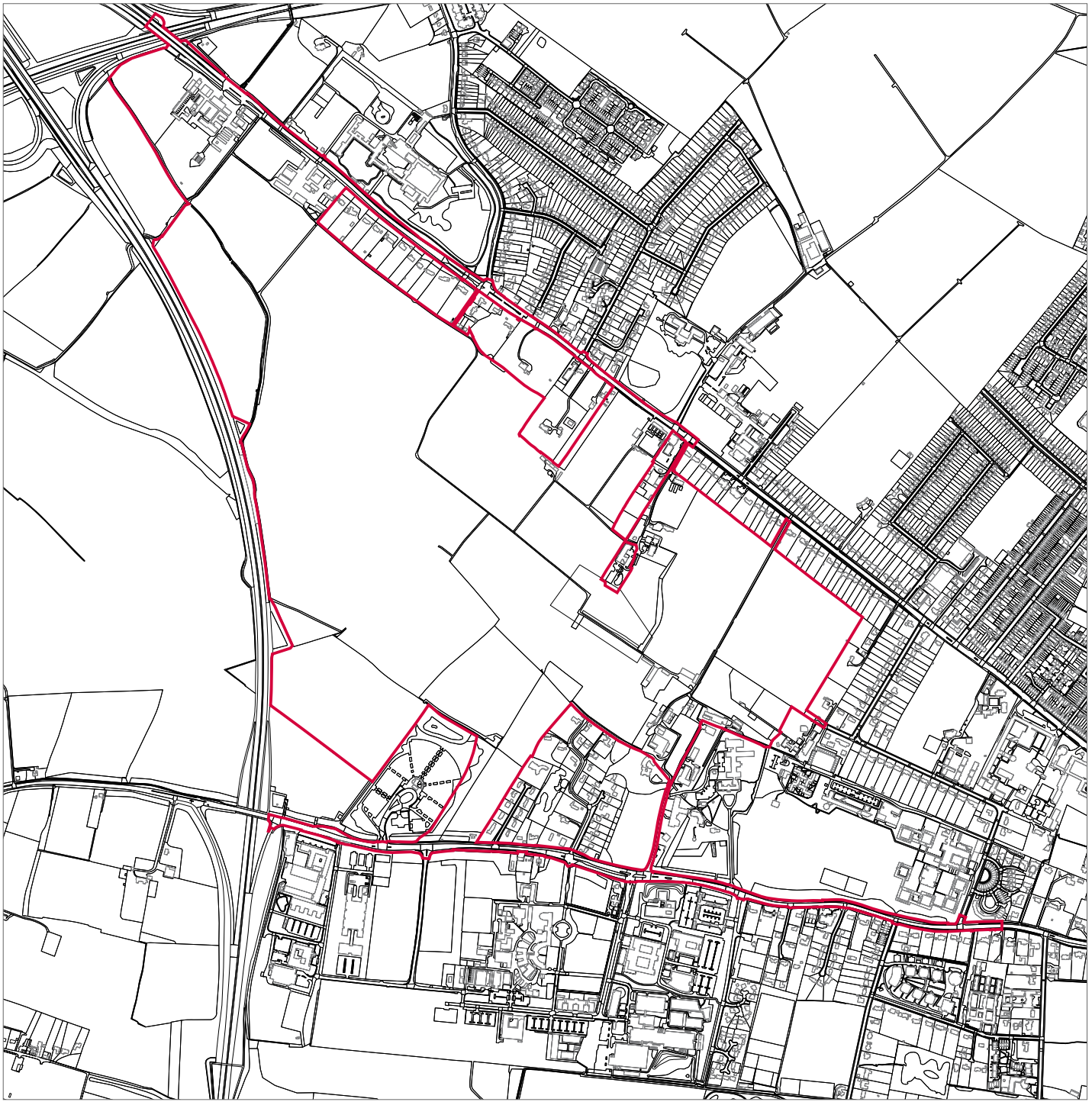
The complete ES can also be obtained in CD format for £15 from the same address. Copies of all documents are available to view electronically at:

http://www.nwcambridge.co.uk/

KEY

Application Site

Figure 1. Application Site Context



KEY

For Approval:

- Application site boundary

Figure 2.

All information other than that identified as being for approval is shown for contextual purposes only.

North West Cambridge

NWC/OPA/APP/01 - Plan for Approval: Application Site Boundary

September 2011

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0 10 50 100m

Scale 1:5000@A1

Assessment Approach

EIA Methodology

EIA is a process for identifying the environmental effects (positive and negative) of a proposed development before planning permission is granted. The aim of the EIA is to prevent, reduce or offset the significant adverse environmental effects of development proposals and enhance positive ones. This ES has identified and assessed the likely significant environmental effects of the Proposed Development. This enables the importance of predicted effects to be evaluated by the Local Planning Authority (in this case CCC and SCDC) before a decision is made about the planning application. The prediction of effects in the ES relates to both the construction and the completed phases of the Proposed Development assuming the first occupation of the Proposed Development occurs in 2014 and the Proposed Development is completed in 2026.

The ES identifies and assesses any environmental effects resulting from the Proposed Development which are likely to be of significance and provides a description of the measures proposed in order to avoid, reduce or manage, if possible, any significant adverse effects and to deliver significant beneficial effects.

Scope

The following environmental issues associated with the Proposed Development are within the ES:

- Socio-Economic;
- Landscape and Visual;
- Ecology and Nature Conservation;
- Geological Resource (SSSI);
- Archaeology;
- Cultural Heritage;
- Agricultural Circumstances;
- Traffic and Transport;
- Noise Environment;
- Air Quality;
- Hydrology, Drainage and Flood Risk;
- Geotechnical Issues and Contaminated Land;
- Utilities and Services; and
- Sustainability Considerations.
- Cumulative effects and effect interactions.

Significance Criteria

Significance reflects the relationship between two factors:

The magnitude or severity of an effect (i.e. the actual change taking place to the environment); and

The sensitivity, importance or value of the resource or receptor.

Within the ES, the following matrix (see Table 1) has generally been used to define the level of significance of effects.

Effects are also described as:

- **Adverse** - detrimental or negative effects on an environmental resource or receptor;
- **Beneficial** - advantageous or positive effect on an environmental resource or receptor; or
- **Negligible** - a neutral effect on an environmental resource or receptor.

Hence, for example, within the ES and as summarised in this document, a low level effect or change (e.g. low level of noise increase) on a low sensitivity receptor (e.g warehouses) might be described as having a **minor adverse** effect.

Mitigation and enhancement

Measures to avoid, minimise or manage any significant adverse environmental effects, or to ensure realisation of significant beneficial effects, are assumed to have been incorporated into the design of the Proposed Development and the methods of its construction from the outset. Where measures are not set out in the Description of the Development or the Parameter Plans these will be the subject of appropriate planning conditions or obligations. The assessment is of the Proposed Development incorporating these measures. Where nevertheless, the assessment of the Proposed Development has identified potential for significant adverse environmental effects, the scope for mitigation of those effects, for example by way of compensatory measures, has been considered.

Cumulative and Interactive Effects

Both Cumulative and Interactive effects have been considered.

Interactive or In combination effects are those which would be likely to arise from interactions between different elements of the Proposed Development to give rise to additional or greater or smaller effects; and of any interaction between effects on different environmental media to give rise to any further, additional, fewer or smaller effects.

Cumulative effects are those which would be likely to arise from the combination of likely significant effects from the Proposed Development and those from other proposed or permitted schemes in the vicinity acting together during either or both the construction and operational phases.

The schemes considered in the cumulative assessment have been identified through consultation with CCC and SCDC and include:

- West Cambridge
- Northstowe
- National Institute of Agricultural Botany 1 (NIAB1)
- National Institute of Agricultural Botany 2 (NIAB2)
- Orchard / Arbury Park.

These sites are shown on Figure 3.

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

Table 1: Degrees of Significance and their criteria

KEY

- Application Site Boundary
- NORTHSTOWE – To the NW of Cambridge to the E of Longstanton & to the N of Oakington includes former Oakington Land 10km (by road) Barracks, Oakington Airfield, Brookfields Farm & Cambridge Golf Club & Road Corridors leading NE along the A14 between Hattons Rd & Dry Drayton Rd Junctions In the Parishes of OAKINGTON & Longstanton Cambridgeshire (otherwise known as Former Oakington Barracks Site!)
- NIAB1 – Land between Huntingdon Road and Histon Road, Cambridge, Cambridgeshire, CB3 0LE.
- NIAB 2 – Land at North West Cambridge, Huntingdon Road to Histon Road.
- ORCHARD/ARBURY PARK - Kings Hedges Road Cambridge In the Parish of Orchard Park
- West Cambridge

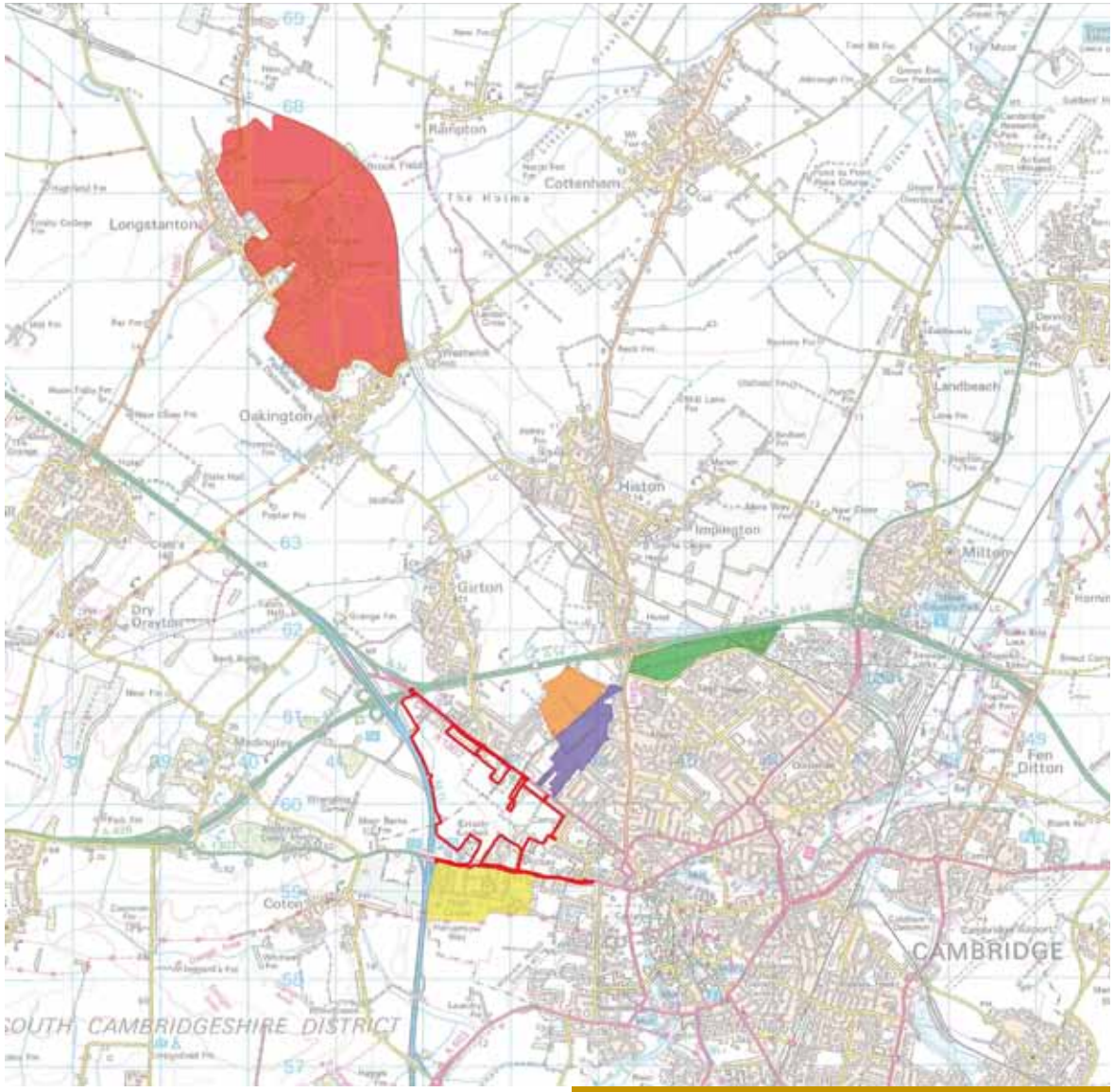

Figure 3. Cumulative Schemes

Application Site Description

The Application Site is located approximately 2km to the north-west of the centre of Cambridge in Cambridgeshire on the edge of the urban area. It lies within an approximately triangular area of land bounded by three highways. To the north the Application Site incorporates Huntingdon Road, beyond which lies residential development and agricultural fields. To the west the Application Site is bound by the M11 motorway, beyond which lies land in agricultural use, while to the south the Application Site incorporates the A1303 (Madingley Road), and is bound by residential properties and the Park and Ride car park. Agricultural fields and residential properties bound the Application Site to the east.

Topographically the Application Site is gently undulating and has few distinctive features although it rises slightly in a north easterly direction across the Application Site. On the western margins adjacent to the M11, is a very shallow valley occupied by the Wash Pit Brook which flows in a northerly direction eventually joining the River Cam off site. Beyond the M11 is largely open agricultural land.

The built form of Cambridge closely abuts the Application Site. The south eastern margins extend to the suburban edge of the City served off Storeys Way, a residential thoroughfare which comprises mainly two storey dwellings and the edge of Churchill College campus. This suburban edge also extends along the north eastern boundary of the Application Site. On the south side of Huntingdon Road is a ribbon of detached dwellings fronting the highway. The northern side of Huntingdon Road abuts the south western edge of the settlement of Girton.

On the southern margin of the Application Site there are groups of University buildings accessed from Madingley Road via an existing roadway. Further to the west along Madingley Road is another area of residential development served by Lansdowne Road and Conduit Head Road; further west again lies the Madingley Road Park & Ride site on the southern margins of the site. On the south side of Madingley Road is the West Cambridge Campus comprising University faculty and other buildings.

The Application Site as comprises approximately 150ha of land predominantly in agricultural use.

The Application Site functions as part of the University farm. It is subdivided into a number of fields most of which are given over to arable production it also includes parts of Huntingdon Road and Madingley Road. The fields are generally separated by fences and low hedgerows with occasional small groups of trees typical of the scenery in this part of Cambridgeshire.

Proposed Development

The Proposed Development comprises an application for planning permission for the following:

- Up to 3,000 dwellings; (Class C3 and C4)
- Up to 2,000 student bedspaces; 98,000 sq.m.
- (Class C2)
- Up to 100,000 sq.m. new employment
- floorspace, of which:
  - Up to 40,000 sq.m. commercial employment floorspace (Class B1(b) and sui generis research uses)
  - At least 60,000 sq.m. academic employment floorspace (Class D1)
- Up to 5,300 sq.m. gross retail floorspace (Use Class A1/A2/A3/A4/A5) (of which the supermarket is not more than 2,000 sq.m. net floorspace)
- Senior living; up to 6,500sq.m. (Class C2)
- Community centre; up to 500 sq.m. (Class D1)
- Indoor sports provision, up to 450 sq.m. (Class D1)
- Police; up to 200 sq.m. (Class B1)
- Primary Health Care; up to 700 sq.m. (Class D1)
- School; up to 3,750 sq.m. (Class D1)
- Nurseries; up to 2,000 sq.m. (Class D1)
- Community Residential; up to 500 sq.m. (Class C3)
- Hotel (130 rooms); up to 7,000 sq.m. (Class C1)
- Access roads
- Pedestrian, cycle and vehicle routes
- Parking
- Energy Centre; up to 1,250 sq.m.
- Provision and/or upgrade of services and related service media and apparatus including pumping stations, substations and pressure regulators
- Drainage works (including sustainable ground and surface water attenuation and control)
- Open space and landscaping (including parks, play areas, playing fields, allotments, water features, formal/informal open space, maintenance sheds, pavilions and support facilities)
- Works to Washpit Brook (including enlarged channel, storage area and flow control structure)
- Earthworks to provide revised ground contours
- Demolition of existing buildings and structures

Huntingdon Road - Highway and Utility Works

- Construction of a new three arm and a new four arm signal controlled junctions, including pedestrian and cycle crossings, to provide access to the Proposed Development from Huntingdon Road
- Installation of a toucan crossing across Huntingdon Road
- Construction of sections of unsegregated footway/cycleway and provision of sections of on-carriageway cycleway on the southern side of Huntingdon Road
- Diversion and/or replacement and/or protection of existing utilities affected by the proposed highway works
- Provision of new telecommunications infrastructure and connection to existing utility infrastructure situated along Huntingdon Road
- Related landscaping, accommodation works, street furniture, drainage, telemetry and utilities

Madingley Road - Highway and Utility Works

- Junction improvement works at the High Cross/ Madingley Road junction to alter it from a three arm priority junction to a four arm signal controlled junction, including pedestrian and cycle crossings, to provide access to the Proposed Development
- Installation of a toucan crossing across Madingley Road
- Diversion and/or replacement and/or protection of existing utilities affected by the proposed highway works
- Installation of a retaining wall along Madingley Road
- Construction of sections of unsegragated footway/ cycleway and provision of sections of on-carriageway cycleway on the northern side of Madingley Road.
- Provision of a new pumped foul water rising main, including chamber connection, and new telecommunications, electricity and gas infrastructure and the associated connection to existing utility infrastructure situated along Madingley Road
- Related landscaping, accommodation works, street furniture, drainage, telemetry and utilities

In addition to the above works, the ES considers a proposed potable water main link.

Cambridge Water Company has indicated that it will be necessary to reinforce the existing potable water supply network to allow the Proposed Development to be supplied in 2014 as the northern arm of the ring main system around Cambridge is currently close to capacity. The proposed reinforcement works would include the provision of a new 450mm diameter ring main that would extend over a length of 3.2km from the 18" main located 1.5km to the south of the Application Site to the existing water mains situated near the Histon junction of the A14 trunk road.

Links to the new water ring main are not included within the application since they would fall to be provided by Anglian Water following a requisition under the Water Industry Act 1991. Nevertheless, in recognition of the importance of this connection to the Proposed Development, the likely significant environmental effects of provision of this connection have been considered and reported alongside utility connections required in connection with the Proposed Development.

There are two connection routes for the proposed water main connection. These are described further below in relation to Utilities and Services.

Development Parameters

A set of Development Parameters and the associated statements define the limit of the Proposed Development, as illustrated on Figures 4 to 8. The Parameter Plans set out the Applicant's intentions for the layout of the Proposed Development within the limits set out by the Development Parameters which are explained below.

Built development will be divided between the three development areas as shown on Figure 4. Each development area is subject to the overriding maxima in terms of total floorspace (or dwellings) for the Proposed Development and total floorspace (or dwellings) within particular categories of development. The hatched area on Figure 4 indicates zones in which land use flexibility may be achieved through extension of adjacent land uses into these zones.

The boundaries between buildings and their curtilage, movement routes and open land will be determined by approval of reserved matters.

Figure 5 defines the maximum heights of buildings as measured to the apex of the roof (excluding any lightening conductors, weather vanes, rooftop plant, telecommunications equipment and aerials).

The Application Site has been divided into a series of building zones as identified on Figure 6. which are tied to maximum and minimum dimensions of the buildings within each building zone of the development.

KEY

Contextual Information:

- Existing and retained buildings
- Indicative primary and secondary routes (reference NWC/OPA/PAR/02)
- Open land (reference NWC/OPA/PAR/03)
- Open land within school site (reference NWC/OPA/PAR/03)
- Potential reserved Energy Centre site: sui generis (B2)

For Approval:

- Application site boundary
- Development areas
- Residential: C3, C4
- Collegiate Housing: C2
- Academic/Research: D1, B1(b), sui generis
- Residential and complementary mixed uses: A1, A2, A3, A4, A5, C1, C2, C3, C4, D1, D2, sui generis (B2, Energy Centre)
- Residential and complementary mixed uses: C3, C4, D1, A1, A2, A3, A4, A5
- School
- Land use flexibility zone
- Western Edge land use flexibility zone

Figure 4.

All information other than that identified as being for approval is shown for contextual purposes only.

North West Cambridge

NWC/OPA/PAR/04/A - Land Use (Built Development and Ancillary Space) Parameter Plan: Zone B

February 2012

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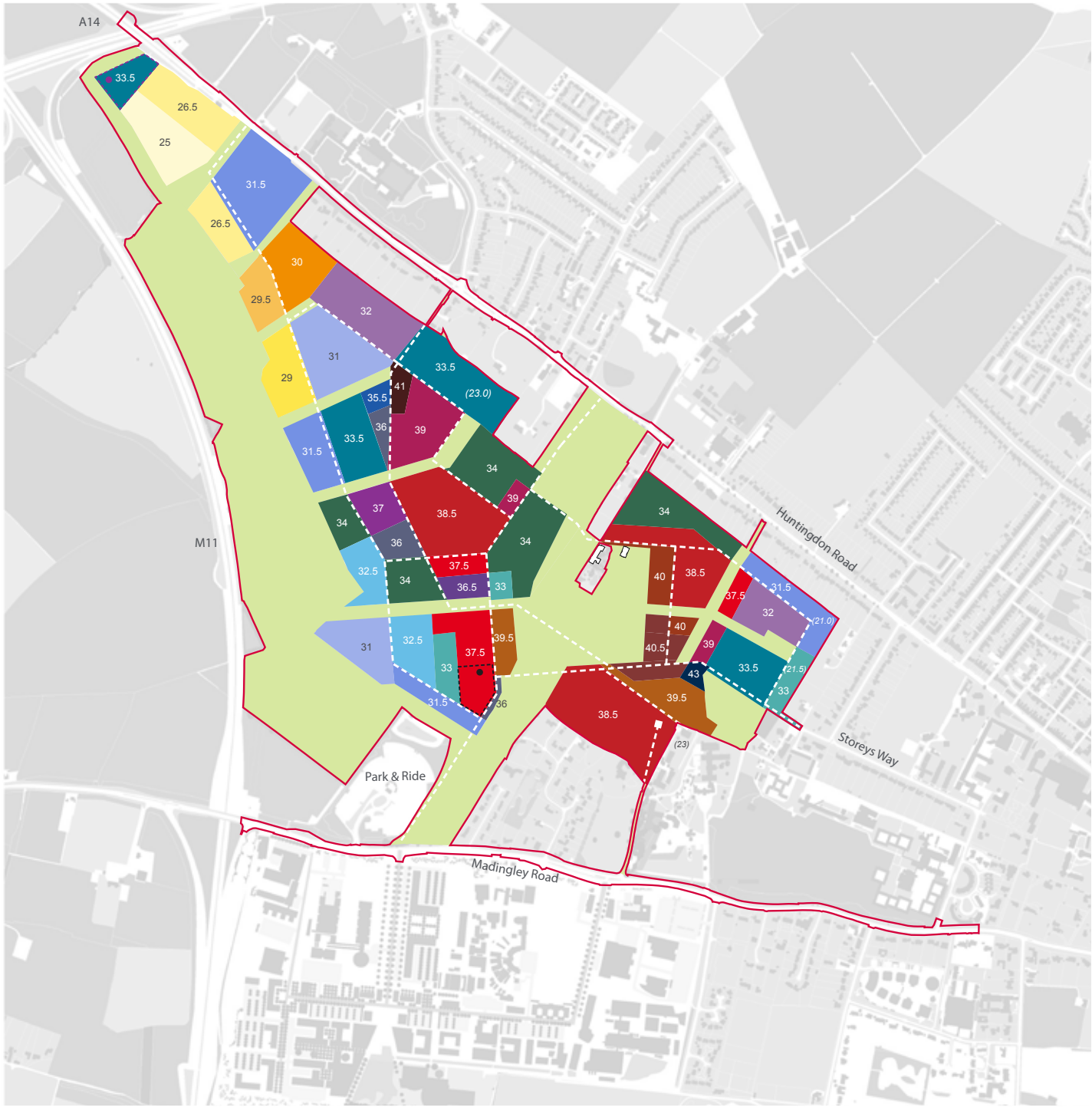
0 10 50 100m
Scale 1:5000@A1



KEY

Contextual Information:

- Existing and retained buildings
- Indicative primary and secondary routes (reference Access Parameter Plan NWC/OPA/PAR/02)
- Open land (reference NWC/OPA/PAR/03)
- Open land within school site (reference NWC/OPA/PAR/03)
- Indicative location of Energy Centre flue
- Indicative potential reserved location of Energy Centre flue
- (x.x) Existing ground level metres AOD
- Reserved Zone for Potential Energy Centre flue of 1.5m diameter and 53.5m AOD

For Approval:

- Application dite boundary

Maximum building heights

- 25.0 metres AOD
- 26.5 metres AOD
- 29.0 metres AOD
- 29.5 metres AOD
- 30.0 metres AOD
- 31.0 metres AOD
- 31.5 metres AOD
- 32.0 metres AOD
- 32.5 metres AOD
- 33.0 metres AOD
- 33.5 metres AOD
- 34.0 metres AOD
- 35.5 metres AOD
- 36.0 metres AOD
- 36.5 metres AOD
- 37.0 metres AOD
- 37.5 metres AOD
- 38.5 metres AOD
- 39.0 metres AOD
- 39.5 metres AOD
- 40.0 metres AOD
- 40.5 metres AOD
- 41.0 metres AOD
- 43.0 metres AOD

- Zone for Energy Centre flue of 0.6m diameter and 42.5m AOD

Figure 5.

North West Cambridge

NWC/OPA/PAR/06/A - Building Heights Parameter Plan: Zone B

February 2012

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0 10 50 100m

Scale 1:5000@A1

KEY

Contextual Information:

- Indicative primary and secondary routes (reference NWC/OPA/PAR/02)
- Open land (reference NWC/OPA/PAR/03)
- Open land within school site (reference NWC/OPA/PAR/03)

For Approval:

- Application site boundary
- Building zones

Figure 6.

All information other than that identified as being for approval is shown for contextual purposes only.

North West Cambridge

NWC/OPA/PAR/05/A - Development Building Zones Parameter Plan: Zone B

February 2012

UNIVERSITY OF CAMBRIDGE

0 10 50 100m
Scale 1:5000@A1

KEY

Contextual Information:

- Existing and retained buildings
- Open land (reference NWC/OPA/PAR/03)
- Open land within school site (reference NWC/OPA/PAR/03)
- Primary street
- Secondary street
- Primary pedestrian/cycle route
- Secondary pedestrian/cycle route

For Approval:

- Application site boundary
- Primary street zone*
- Secondary street zone *
- Primary pedestrian/cycle route zone *
- Secondary pedestrian/cycle route zone *
- Restricted Access Zone
- Market Square pedestrianised Zone

* Zones may overlap

Figure 7.

All information other than that identified as being for approval is shown for contextual purposes only.

North West Cambridge

NWC/OPA/PAR/02/A - Access Parameter Plan: Zone B

February 2012

UNIVERSITY OF CAMBRIDGE

0 10 50 100m
Scale 1:5000@A1

Movement Corridors

Figure 7 identifies movement corridors within which primary vehicle routes, secondary vehicular routes, primary pedestrian/cycle routes and secondary pedestrian/cycle routes are to be constructed. These routes are in turn subject to parameters e.g. the total carriageway width for any two-way primary carriageway along any Primary Vehicular Route shall not exceed 7.3m and the width of any one way Primary Vehicular Route shall not exceed 4.5m excluding any turning head, verge, footways, central reservations, visibility splays, passing places and pull-ins for bus stops, and the market square pedestrianised area.

Access Points

There are to be no more than four general use permanent vehicular access ways into the Proposed Development once completed. The principal points between which access may be gained to the Proposed Development are indicated on Figure 7, A-B, C-D, E-F and G-H.

Restricted Access Zone

A restricted access zone will be created in the vicinity of the local centre within the zone indicated on Figure 7. Access to this zone will be limited to pedestrians, cyclists, public transport, services and emergency vehicles.

Market Square Pedestrianised Zone

Within the local centre a market square will be closed to vehicular access, excepting service and emergency vehicles except for access to designated car parking areas, where vehicular access will be permitted.

KEY

Contextual Information:

- AAP Development Footprint / Green Belt Boundary
- Existing and retained buildings
- Indicative primary and secondary routes (reference NWC/OPA/PAR/02)
- SSSI boundary
- SSSI 10m buffer
- Washpit Brook
- Areas of existing open land, woodland & treecover to be retained
- Secondary open land

For Approval:

- Application site boundary
- Primary open land (1-5)
- Primary open land boundary
- Open land within school site
- Secondary open land zone
- Zone for works to Washpit Brook
- Zone for location of flow control structure

Figure 8.

All information other than that identified as being for approval is shown for contextual purposes only.

North West Cambridge

NWC/OPA/PAR/03/A - Open Land and Landscape Areas Parameter Plan: Zone B

February 2012

UNIVERSITY OF CAMBRIDGE

0 10 50 100m
Scale 1:5000@A1

Landscaping and Open Land

The zones within which open land may be provided are identified on Figure 8. The exact location and configuration of each space, including recreation provision and size, will be defined at the reserved matters stage.

Development of any buildings or structures within Open Land are to be restricted to buildings and structures consistent with the use of the land as open land, including plant and equipment storage, bridges, pavilions, cafes, changing rooms, public toilets, information centres and buildings for housing utility undertaker's apparatus. Development and/use within Open Land for the following purposes is (unless otherwise indicated) acceptable: open land, formal and informal recreation and outdoor entertainment; landscaping; surface water balancing and other water features; sustainable drainage systems; nature conservation; allotments; woodland; vehicular pedestrian and cycle routes within movement corridors and utility and maintenance corridors for predominantly underground utility apparatus.

The Primary Open Land is divided into five areas shown on Figure 8:

- Primary Open Land 1 may be additionally used for school playing fields;
- Primary Open Land 2 will not include flood lighting;
- Primary Open Land 3 includes formal playing pitches and will not include floodlighting;
- Primary Open Land 4 may include flood lighting in connection with sports pitches; and
- Primary Open Land 5 will provide land for formal and informal recreational use and will not include floodlighting. A new flow control structure will be provided.

The zones within which Secondary Open Land is to be located are identified on Figure 8 shaded in light green. The minimum width of any area of Secondary Open Land (measured between its two longest boundaries) shall not be less than 20m.

Tertiary open land may be located within any of the building zones shown on Figure 8.

Phasing and Implementation

The Proposed Development is intended to meet the Applicant's requirements over an extended period. It is to be constructed over a period of approximately 15 years with completion occurring in 2025-2026. Assuming consent is granted in 2012 the first phase, where the basic structure of the development and the construction of the central physical and social infrastructure of the new community, will be undertaken will be completed by the end of 2014. Thereafter in the period to 2025/2026 the Proposed Development has been split into a further 3 phases (Phases 2 - 4) covering 3 - 4 year periods.

Alternatives

The EIA Regulations require that the Applicant provides an outline of the main alternatives they have considered.

A number of alternative forms of development have been extensively explored prior to and since the publication and adoption of the AAP. The Applicant and consultants have undertaken a number of masterplanning and public consultation exercises which, after taking into account environmental considerations, have led to refinements as to the location and form of the built development, as opposed to the actual extent of the application site identified by the adopted AAP.

The area around North West Cambridge has been subject to consideration initially at strategic level (Cambridgeshire and Peterborough Structure Plan) then at local level through the Local Plan process where the sustainability credentials have been considered in comparison with other potential sites. Subsequently the area has been considered again at the regional and sub regional level through the RSS process for the East of England Plan and then more recently still it has been considered in site specific terms during the preparation of an Area Action Plan specifically covering the North West Cambridge area. Both of these latter processes were accompanied by Sustainability Appraisals during the course of preparation which identified the benefits of this site/area over other alternatives. In October 2007 prior to the formulation of the adopted Area Action Plan five potential site footprints were assessed by way of the Site Footprint Assessment Document. Following this a series of design iterations have been considered during a series of masterplanning workshops and consultation exercises.

Planning Policy

So far as the potential alternatives for the distribution of uses within the Application Site a 2007/2008 masterplan underpinned the University's representations to the Area Action Plan Public Examination.

The North West Cambridge Area Action Plan, adopted in October 2009, identified a new boundary for development which expanded the development footprint and provided a series of detailed sustainability and energy standards for the scheme.

Since the AAP boundary was fixed by the adoption of the AAP in October 2009, further design development and refinement of the masterplan have led to land use proposals, including residential, academic and commercial research space, community facilities and landscaping proposals. In particular, detailed capacity and 3-dimensional studies have informed a comprehensive understanding of land use distribution and potential character.

The Applicant held a series of Stakeholder Workshops, Public Exhibitions and a Public Workshop during 2009 and 2010. The first round of consultation was held in November 2009 and the second round of consultation in July 2010. The consultation responses received and the outputs from the workshop events and public exhibitions took into account various environmental effects and the need to minimise them have informed both the masterplan evolution and the development parameters prior to the submission of this application.

In June 2010 the Cambridgeshire Quality Panel held a review of the North West Cambridge site. The Panel concluded that there has been some dedicated, robust work behind the development of the plans to date and the aspiration to create a world class place to live and the desire to link the city with the Proposed Development is highly commended by the panel. Further, in July 2010 a CABE Review of the North West Cambridge scheme was conducted. The CABE reviewers commented that the design team had presented a logical masterplan strategy for the Application Site which placed a clear emphasis on connectivity, landscape character and environmental sustainability. The reviewers felt that the mix and planning of uses has the potential to create a richness and vibrancy across the development.

Both of the design reviews informed the later development stages of the Proposed Development set out in the Design, Access and Landscape Statement

Planning policy relevant to the Proposed Development is contained in the National Planning Policy Framework, the statutory Development Plan Policy incorporating the adopted East of England Plan 2008 which is the Regional Strategy for the East of England region), the Cambridge City Local Plan (adopted in 2006), the South Cambridgeshire District Council Core Strategy (2007) and the North West Cambridge Area Action Plan DPD (adopted October 2009) (the "AAP").

The AAP is directed at, and supports the Proposed Development. It is highly relevant to the Application an .contains a large number of policies and advice as to how the development of North West Cambridge should proceed.

A wide variety of other planning policies have been considered throughout the ES. There is wide ranging policy support and compliance.

Socio-Economic Assessment

The Proposed Development will have a range of socio-economic effects, some temporary, some longer-term.

Scope

The analysis in the ES has considered:

- Construction employment;
- Permanent changes in employment brought about by the development;
- The provision of new homes (market and key worker) relating to population increase; and
- The effect of increased residential population on the requirement for local services and facilities

Assessment

Employment Effect

Upon completion, the Proposed Development will make significant contributions to the local, regional and national economies through creation of approximately 5,875 permanent jobs, principally through the academic and commercial research floorspace. These jobs will largely serve residents of the Application Site and the surrounding area, enabling positive effects on sustainable travel and local employment. This is assessed as **moderate beneficial (positive)** at local level, for both 2014 and 2026

In addition to the permanent employment associated with the completion of the research floorspace, the capital invested in the infrastructure and construction phase of the Proposed Development will generate a range of further local employment opportunities, it is estimated that the Proposed Development will create around 74-191 FTE (full time equivalent) construction jobs to 2014 and 858 FTE construction jobs to 2026, therefore creating a **moderate beneficial** effect .

In relation to cumulative effects no employment displacement is expected and the Proposed Development has the potential to provide local employment opportunities for residents of the NIAB 1 and NIAB 2 developments as well. In cumulative terms the effect is, therefore, also expected to be **major beneficial**.

Local Services and Facilities

The social and community demands of the anticipated 8,590 person residential population will be met through a range of facilities, including a primary school, early years provision (in three locations), a community centre, primary care facility, police facility, and the full range of formal and informal recreation provision. Secondary school and library provision will be met off-site, and a contribution will be made to swimming pool provision.

The effects of the Proposed Development on social and community demands range from:

- **Negligible** in relation to the effect on health services, early years and primary and secondary education capacity, community and library space, open land (at 2014) and the effect of retail provision on town centre vitality and viability
- **Minor Beneficial** in relation to the effect on police/ emergency services; and
- **Moderate Beneficial** in relation to the effect on open land in 2026.

When looked at cumulatively with NIAB 1 and NIAB 2 the effects on social and community demands are:

- **Negligible** in relation to the effect on health services, early years and primary school capacity as local provision will be located on both the Proposed Development and NIAB developments.
- **Negligible** in relation to sixth-form capacity as education authorities have advised that there is excess capacity in existing sixth form provision beyond that required to meet the needs of the Proposed Development, NIAB and NIAB 2.
- The population growth in relation to secondary school provision is considered **minor beneficial (positive)** as it will fully provide for the secondary school aged pupils expected to come forward from the Proposed Development, NIAB1 and NIAB2. The new school located at NIAB2 will also create additional secondary school capacity for the immediate hinterland of the developments due to its greater catchment area and geographical coverage.
- **Negligible** in respect of community facilities and library. Community provision is being met through facilities at both the Proposed Development and NIAB 1, and library provision is being made at NIAB 1 to meet the needs of the populations of the Proposed Development, NIAB 1 and NIAB 2.
- **Negligible** in respect of demand on police services as the size of the police facility at the Proposed Development has been developed specifically to meet the cumulative need generated by the Proposed Development and both NIAB developments.
- A **Moderate Beneficial** effect on open space provision as the requirements are being met locally, on-site, across the individual developments and the Proposed Development will provide open land for formal and informal recreation in excess of that required to meet the needs of the Proposed Development itself.

Landscape and Visual Assessment

Within the ES an assessment of the likely significant effects of the Proposed Development on landscape character and visual amenity and the likely significant effects of night time artificial lighting has been undertaken.

Effects on Landscape Character associated with a development relate to changes to the fabric, character and quality of the landscape resource and how it is experienced. There are changes to the landscape from the physical form of the proposed development, and its construction, including built phases and the final finished form.

Effects on Visual Amenity concern changes in views and people's response to changes in visual amenity.

Effects of Artificial Lighting concern the effects on residential properties adjacent to the Application Site, wildlife / habitat on and around the Application Site and two local observatories.

Landscape and visual effects are interrelated but assessed separately. Both landscape and visual effects can be positive (beneficial) or negative (adverse). A development may have no significant visual effects but result in an adverse effect on the landscape character; conversely, a development may have significant visual effects, but insignificant landscape effect.

Landscape Principles

Consideration of the range of likely landscape and visual effects was taken into account throughout the design development of the Proposed Development. .

The landscape principles are outlined below and illustrated on Figure. The intention of the landscape principles is to create a scheme that is functional and that builds on the existing richness and diversity of Cambridge, creating a setting that is in keeping with the character of Cambridge and its surrounding undulating topography and farmed landscape.

The landscape strategy for the Proposed Development proposes four typical local character areas. These are based on Figure 8 Open Land and Landscape Areas, and defined for the purpose of this assessment as follows:

- Western Edge
- Parkland (the area of the Western Edge adjacent to the built form)
- Landscape Fingers
- Girton Gap, Central Open Space and Ridge & Furrow

The Western Edge comprises the western boundary of the Application Site directly adjacent to the motorway. Landforms that seek to balance the cut and fill from across the site will modify the existing topography and in some locations the topography will tilt upwards from the M11 towards the Parkland and the built edge.

The intention is to restore the use of the Western Edge to uses compatible with the landscape character, including drainage, formal and informal recreation and allotments, thus contributing to the existing open arable character of other adjacent areas along the motorway.

The Parkland is a valley that runs north to south as a narrow band adjacent to the Western Edge. At a lower level to the Western Edge, the Parkland is sheltered and has the function of collecting and distributing the water run-off from the landscape fingers and other immediately adjacent areas. The character of this area is comparable to the 'Fens' in Cambridge, with its extensive grasslands and isolated willows and poplars sitting next to the waterways. A stretch of land towards the eastern boundary of the Parkland will be dedicated to allotment gardens.

The Landscape Fingers run from Huntingdon Road towards the M11, perpendicular to the Parkland, and through the Proposed Development. These 'fingers' connect the development to the Parkland through a series of footpaths and public spaces. Their character is diverse and is directly associated with the building typologies, ranging from neighbourhood pocket parks, to local play areas, and will also include drainage functions.

The Girton Gap, Central Open Space and Ridge & Furrow area comprises a series of existing features including the Traveller's Pit Site of Special Scientific Interest (the "SSSI") and the distinctive open area to the south of the site. Proposals for this area include the sports fields adjacent to Huntingdon Road and immediately east of the local centre, the SSSI, which will become publicly accessible open space, and the ridge and furrow fields.

Within Primary Open Land, buildings and structures consistent with the use of the land as open space, including plant and equipment storage, bridges, pavilions, cafes, changing rooms, public toilets and information centres and buildings for housing utility undertakers' apparatus may come forward subject to compliance with conditions.

Assessment Approach

Landscape and Visual

The landscape and visual assessment identifies and categorises the significance of effects that may arise as result of the Proposed Development at three distinct points in time: 2014; Development Completion (2026) and during the Summer months 15 years after Development Completion (2041).

The assessment identifies twelve viewpoints which were agreed with both CCC and SCDC. These reflect the most important locations likely to be affected by views to the Proposed Development, including footpaths and public rights of way, roads, and viewpoints along the M11 motorway. The assessment also considers landscape designations and relevant landscape and townscape effects, including those from the Western Claylands character area (identified in the Cambridgeshire Landscape Guidelines and the Cambridge Green Belt Study), within which the Application Site lies, and relevant townscape character areas adjacent to (and falling partially within) the Application Site, such as West Cambridge, part of the wider Bespoke Houses and Colleges type.

The Application Site contains a section of the Green Belt, and the Landscape Principles (see above) address this relationship by enhancing the connectivity and permeability between the green spaces and the built form. The Proposed Development provides an opportunity to enhance the use and access to the Green Belt by making the area more accessible for leisure and recreational purposes, it will also redefine the urban edge of Cambridge while enhancing the interface between the urban and rural character.

The process of change that is proposed on the Application Site will lead to both temporary and permanent effects as to how the Application Site is seen and experienced by people who live, work, visit and travel through the surrounding landscape and townscape. The Proposed Development will extend the existing urban character of Cambridge outward but will integrate it with the existing open area on the western part of the Application Site which will be retained. In most long distance views, the Proposed Development will be seen as an extension of Cambridge's urban edge. It will not result in adverse disruption to the existing views nor will it become a focus.

Artificial Lighting

The effects of artificial lighting are addressed in the same way as the Landscape, Townscape and Visual Environment effects are assessed, namely by identifying a baseline lighting condition; identifying and assessing the sensitivity of receptors; identifying the required lighting provisions for the Proposed Development; and assessing the cumulative lighting condition change, during the Construction phase and at 2014 and 2026.

Landscape Character Effects

As at 2014, the Proposed Development is likely to result in **minor to moderate** adverse effects on the more local Western Claylands character area. The likely effect on other character areas around the Application Site are classified as **negligible**.

At 2026 (Development Completion), **moderate adverse** effects are likely to occur on a localised part of the Western Claylands Character Area. Whilst this effect will be significant, it is limited to the more eastern urban/rural interface of this character area and is unlikely to affect the wider integrity of this character area. Indeed the Western Claylands could arguably be redefined with the new urban edge of the Application Site providing the new boundary to this character area.

Likely significant effects of the Proposed Development on the surrounding landscape designations (Green Belt, Madingley Park, American Cemetery and Coton Countryside Reserve) are assessed are likely to be **negligible** both at 2014 and 2026.

Visual Effects

When viewed from each of the twelve viewpoints assessed, taking account of construction and operational effects associated with the Proposed Development, the Proposed Development is considered likely to have only **negligible to minor adverse** effects as at 2014.

After Development Completion at 2026, two of the twelve viewpoints are assessed as to be subject to **major adverse** effects due to their proximity to the Application Site and the focus which the development will newly have in their immediate views. These comprise Viewpoint 9 (Howe Farm from Washpit Brook) and Viewpoint 10 (Howe Farm from footpath at Huntingdon Road). View 8: M11 Motorway looking east/southeast will be subject to **moderate/major adverse** effect. It should be noted, however, that these viewpoints represent users of footpaths and drivers along the M11, who are transitory in their use thereby limiting the duration of the adverse visual effects experienced. The remaining viewpoints would be subject to **minor adverse to moderate adverse** effects.

The Proposed Development lies in close proximity to the West Cambridge and NIAB1 and NIAB2 developments. However, it is unlikely that the three developments would be viewed in combination due to the intervening urban form. Given its location and existing localised screening, the Proposed Development is not expected to result in cumulative landscape or visual effects.

Overall the Proposed Development and its inherent Landscape Principles will enable the Proposed Development to be effectively integrated into the north western urban edge of Cambridge, with the wider landscape character and visual amenity remaining unaffected.

Night time Lighting

The analysis indicates the likely significant effects from new lighting for the Proposed Development on the majority of wildlife and habitat receptors would be **moderate adverse**. This effect will only occur where habitat and movement corridors are located and would not apply to the full Application Site. Relocation of habitat to areas unaffected by development and avoidance of lighting along verified commuting corridors may further reduce the relative effect of the Application Site to **minor adverse**.

The analysis indicates the likely significant effects from new lighting for the Proposed Development on the local observatories would be **moderate to minor adverse**. In the context of the potential effect to the optical telescopes used by the observatories, which could be affected by any lighting within a 30-40 mile radius these are currently affected by existing lighting conditions. Consequently the relative effect is expected to be **negligible**.

The analysis indicates the cumulative effect of the required lighting provisions for the Proposed Development is **minor - moderate adverse** and is immediate to the Application Site.

Sky glow would have the most variable potential effect.

The overall effects from new lighting for the Proposed Development will satisfy technical and environmental good practice guidance and are assessed as **minor - moderate adverse**.

Ecology and Nature Conservation

The ES includes an assessment of the likely significant effects of the Proposed Development on ecology and nature conservation. As with the other technical sections in the ES this assessment identified the effects of the Proposed Development against the baseline conditions on the Application Site.

Ecology and Nature Conservation Baseline

The Application Site is not subject to any statutory or non-statutory ecological designations. The Application Site currently comprises intensively managed farmland, two-thirds of which is in arable production and a third comprises grazing pasture, the remainder is occupied by University buildings or existing road infrastructure.

A number of small woodlands are present as well as a former orchard. The fields in the western part of the Application Site are divided by hedgerows, some of which are species-rich. The majority of the field boundaries in the remainder of the Application Site comprise fences, or no longer exist. Mature trees are associated with some of the field boundaries and a proportion of the trees on the Application Site have been shown to support a valuable terrestrial invertebrate assemblage. The Traveller's Rest Pit in the central part of the Application Site is not farmed, and is designated as a geological SSSI. A number of farm buildings are also present.

The Washpit Brook flows through the western part of the Application Site. Surveys in 2004 and 2009 confirmed that the Washpit Brook supports a small population of water voles although no evidence of water voles was recorded in 2011. Occasional ponds are present which support breeding amphibians. Important populations of great crested newts are present associated with off-site ponds (and the Bird Sanctuary ponds and potentially the Park and Ride pond to the south of the Application Site). Common toads occur in the pond at the World Conservation Monitoring Centre in the centre of the Application Site, and the Park and Ride pond (off-site).

The farmland supports breeding birds, a population of brown hares, and is used by foraging bats and badgers. A brown long-eared bat roost and small pipistrelle bat roost is present in one of the farm buildings and numerous badger setts have been recorded across the Application Site.

The Biodiversity Strategy of the Proposed Development

The creation of new habitats within the area of open land along the western edge of the Application Site will incorporate the Washpit Brook. In addition, the new balancing ponds and attenuation features will increase the wetland resource available to invertebrates, water voles and otters. Ponds supporting great crested newts and large populations of common toads will be protected, as will the terrestrial habitat used by these species. Measures to improve the conservation status of the local great crested newt population are a key feature of the design of the Western Edge. Badger setts will also be retained as part of the Proposed Development as far as possible.

The large area of habitat creation along the western edge of the Application Site, along with the creation of other areas of open land, will also create green infrastructure, linking areas of farmland to the north and west of the Application Site. This will allow the creation of an ecological network on the north-western edge of Cambridge. These areas of open land will have a diverse range of functions, particularly the area along the western edge of the Application Site, which will deliver a number of ecological benefits, including improvements to water quality, filtering air and noise pollution, as well as providing a recreational facility, and contributing towards food production.

This area of open land will also provide an ideal opportunity to re-connect people to nature, by providing and encouraging access to the countryside; this will be supported by delivering nature-related education and encouraging voluntary participation in nature conservation activities.

Where the Proposed Development is likely to result in the loss of species, or assemblage of species, from the Application Site (as is the case for brown hares and farmland birds), off-site mitigation has been secured.

Assessment of Effects

Washpit Brook

Given that the Washpit Brook is to be retained and the implementation of measures described above, it is likely that there would be a beneficial effect upon this receptor and its associated species, which would be considered to be minor beneficial effect by 2026. Although some minor beneficial effects would be expected by 2014, these would be considered to be **negligible**;

No other development is assessed as being likely to have significant cumulative effects on the Washpit Brook,

Coton Nature Reserve

Residential properties and employment areas associated with the Proposed Development will be located within approximately 1.5km of the Coton Countryside Reserve, and therefore within the 3 mile radius in which the majority of its visitors live and work. Given the amount of Open Land being created within the Application Site, and the distance of the reserve from the Application Site visitor pressure on the reserve is unlikely to increase significantly. This would therefore not be considered to represent a significant adverse effect, and would be **negligible**.

Given the likely increases in visitor numbers at the reserve that would be expected to arise as a result of the NIAB and West Cambridge developments, a significant cumulative effect would not be anticipated.

Veteran Oak

The veteran oak tree will be retained within the Proposed Development and new tree planting is proposed within the linear parkland. No significant effects are expected on this ecological receptor and so this would be considered to be an effect of **negligible** significance.

The NIAB and West Cambridge developments were not predicted to result in significant adverse effects on mature, veteran or specimen trees.

Hedgerow

Overall the Proposed Development will be expected to deliver an increase in the length of hedgerow present on the Application Site, as well as an enhancement through the replacement of species-poor hedgerows with species-rich planting, and the management of retained hedgerows to maximize their biodiversity value. This beneficial effect is likely to be realised in the long-term (more than 30 years beyond 2026). In the short-term there will be a loss of hedgerow habitat which would be considered to be significant at the local level, therefore, having a **minor adverse** effect at 2014 and at 2026. In the long-term (by 2056) a beneficial effect of local significance is predicted which is an effect of **minor beneficial** significance.

The NIAB development will result in losses of short sections of hedgerow; the West Cambridge development will provide improved wildlife corridors and, therefore, have a potentially beneficial effect on hedgerows. Significant cumulative effects on hedgerows would not be likely.

Invertebrate habitat

Given the retention of the most valuable habitat features for terrestrial invertebrates, significant adverse effects are not predicted at the County level. However, in the short-term (2014 to 2026) there would be a loss of habitat until new planting matures, and off-site measures deliver a measurable benefit. This would be expected to be significant at the Local level and, therefore, an effect of **minor adverse** significance at 2014. In the medium-term (by 2026) a beneficial effect could be realized for some of the species associated with the assemblage, which would be considered to be significant at the Local level and, therefore, a **minor beneficial** effect at 2026.

The West Cambridge and NIAB developments are not assessed as likely to cause significant cumulative effects on invertebrate habitat.

Amphibians

Overall the Proposed Development will be expected to increase the quality of foraging habitat available for the great crested newt population associated with the off-site ponds, as well as increasing the availability of breeding habitat, in the long-term. This is likely to deliver a significant beneficial effect for the local great crested newt population, both in terms of size and extent, which would be realised in the long-term (20-30 years), and would be significant at the District/Borough level. In the short-term, the loss of terrestrial habitat would be expected to give rise to a significant adverse effect at the District/Borough level. The short-term adverse effect would be reduced to not significant by 2026. The effects on great crested newts has, therefore, been assessed to be of **minor adverse** significance in the short-term (up to 2026), **negligible** in the medium-term (2026-2036), and **minor beneficial** in the long-term (post-2036).

Overall the Proposed Development would be expected to deliver a beneficial effect for common toads in the medium-term (likely to be realized by 2026) of local significance. Significant short-term adverse effects are not predicted and, therefore, the effects on common toads would be considered to be of negligible significance in the short-term (up to 2026) and **minor beneficial** in the medium-term (post-2026).

Cumulative effects with the NIAB and West Cambridge developments on the local amphibian populations (newt and common toad) have been assessed as not likely to be significant.

Badgers

Given the apparently fragmented nature of badger populations in the area, and their use of the Application Site, it is considered likely that the resident group of badgers would be able to survive the reduction in area of foraging habitat associated with the development proposals, and would be expected to remain as a viable social group post-development. Significant direct effects on setts are also not anticipated and an artificial sett will provide alternative shelter in a part of the site where it will be fenced off from public interference. It is therefore considered that the Proposed Development will not have a significant effect upon badgers and the effects on badgers at both 2014 and at 2026 would be considered to be of **negligible** significance.

Cumulative effects with the NIAB and West Cambridge developments on badgers have been assessed as not likely to be significant.

Farmland Birds and brown hare

Although specialist farmland bird species and brown hare will be lost from the Application Site as a result of the Proposed Development, after allowing for off-site measures to 'enhance' the habitat on areas of farmland to improve their value for these species, the effects would be **negligible**. In the long-term (by 2026); the Proposed Development will give rise to beneficial effects for other bird species, particularly garden species, of local significance and the effects on breeding birds (not including specialist farmland species) would be considered to be of **minor beneficial** significance in the long-term (by 2026).

Significant cumulative effects with the NIAB and West Cambridge developments in excess of those likely in connection with the Proposed Development itself are therefore not considered likely.

Bats

Overall, significant adverse effects on bats are not predicted; some **minor beneficial** effects may occur, although these are unlikely to be significant and, therefore, the effects on bats would therefore be considered to be of **negligible** significance

In respect of significant effects on bats cumulatively with the NIAB and West Cambridge developments, no adverse effects are likely to arise and beneficial effects may be realized, although these are considered unlikely to be significant.

Soils and Geology

The Soils and Geology chapter of the ES provides an assessment of the likely significant effects associated with the Proposed Development:

- arising from any existing contamination of soil or groundwater or the presence of ground-gas;
- on the area within the Application Site which is designated a Mineral Safeguarding Area in the Cambridgeshire and Peterborough Minerals and Waste Plan and
- on the area within the Application Site which is designated as a Site of Special Scientific Interest (SSSI); the Traveller's Rest Pit.

Contamination of Soil or Groundwater or The Presence of Ground-Gas

The Application Site is underlain in part by gravels. These overlie the Chalk Marl and clay. A formation called the Lower Greensand is present beneath the clay at depth. The Chalk Marl is present on the eastern part of the Application Site.

The eastern corner of the Application Site lies on a highly sensitive aquifer. This relates to the Chalk Marl. A significant proportion of the northern and eastern parts of the Application Site are classified by the Environment Agency as a moderately sensitive aquifer although this relates to the overlying gravels, much of which has been extracted.

The remaining areas of the Application Site have a low groundwater sensitivity and this relates to the clay Bedrock.

The deep Lower Greensand Formation is also a highly sensitive aquifer, but due to the high clay content over it there would be protection from any contaminant movement to the deep groundwater.

There are no active groundwater abstractions present within 500m of the Application Site.

The closest surface water feature of note is the Washpit Brook (a tributary of the River Great Ouse), which flows north across the western part of the Application Site from a small area of woodland named Pheasant Plantation. There are no surface water abstractions present within 500m of the Application Site.

Historically the Application Site was predominantly used for agricultural purposes. The gravel pit that has since become known as the Traveller's Rest Pit was indicated on the eastern part of the Application Site by 1927 and continued to expand up until 1960.

Coprolite was historically mined at the Application Site and in the immediate surrounds. Coprolite diggings were a major industry in the Cambridge area during the late 1800's being used for agriculture, and briefly by the explosives industry. Previous studies report coprolite workings are present across the east of the Application Site. Former gravel extraction has resulted in limited landfill activity at the Application Site and the University Farm Cambridge landfill is recorded within local Authority records. This reportedly received excavated natural materials between 1984 and 1986.

Investigations have revealed no significantly elevated contaminant concentrations and low ground gas issues within the Application Site.

Since ground gas risk is low and there are no significant areas of contamination present on the Application Site as a result of previous and recent land use in either soil or groundwater it is considered that there are unlikely to be any significant effects from the identified sources either during construction or once the Proposed Development is operational at 2014 or at 2026.

In the case of the off-site Potable water main works these pass adjacent to a current and former petrol station and the potential for these sites to have impacted the soils within the proposed working areas would need to be considered, together with contingency options in the event of contamination being encountered.

Cumulative effects are not anticipated with regards contamination as the ground investigation identified no site derived significant soil, groundwater or ground gas contamination. Hence there are no likely significant effects to add to those of any other. The investigations have also demonstrated that there is no off-site contamination that will affect the Application Site.

Mineral Safeguarding Area ("the MSA")

The MSA covers an area of approximately 15.9 hectares but is of insufficient quantity to classify the MSA as economically viable. Nevertheless, the Proposed Development will sterilise the mineral resource and has therefore been assessed as having a **major adverse** effect. The overriding need for the Proposed Development and the allocation of the Application Site for development in adopted local development plans, however, removes any restriction on the Proposed Development that the MSA designation might impose.

To reduce the adverse effect the Applicant will aim to re-use on-site any resource excavated as a consequence of the Proposed Development within the MSA. It is estimated the likely volume of sands and gravels (Head Gravel and Observatory Gravels) that might be excavated and be available for reuse on the Application Site during the construction may be of the order of 4,000 to 5,000m^3.

Traveller's Rest Pit

Within the Application Site a disused gravel quarry known as the Traveller's Rest Pit is an area designated as a Site of Special Scientific Interest (SSSI). This area has been notified as an SSSI due to the presence of a nationally important sequence of fossiliferous gravels, known as the Observatory Gravels.

The Traveller's Rest Pit SSSI is located in the south-eastern part of the Application Site, immediately south of the World Conservation Monitoring Centre. The SSSI covers an area of disused gravel pit and an area of adjacent undisturbed ground to the southwest and west of the gravel pit.

The Traveller's Rest Pit site will be left as primary open land. Some or all of the following changes to the Traveller's Rest Pit may be anticipated:

- Creation of an unlit footpath.
- Creation of access down the steep disused quarry slopes, in association with the footpath.
- Planting of shallow rooting plants.
- Installation of information points adjacent to the SSSI.

Appropriate measures have been incorporated into the Proposed Development to ensure that the integrity of the SSSI is maintained and to enhance beneficial effects, this includes the preparation of a Geological Site Management Plan which has been drawn up in consultation with Natural England. These measures are included as part of the scheme that has been assessed.

With the measures described above there will be a **negligible** effect in 2014.

The assessment of overall significant effects in the 2026 year of assessment indicates that the Proposed Development is likely to have **negligible to minor beneficial** effect on the Traveller's Rest Pit site.

The Traveller's Rest Pit is situated towards the centre of the Proposed Development and will not be affected by any of the other developments in the vicinity of the Application Site either at 2014 or at 2026. There would not therefore be any effects from other developments on the SSSI, with which to accumulate those of the Proposed Development.

Archaeology

An assessment has been undertaken to identify the effects of the Proposed Development on archaeological and within the Application Site.

Twelve distinct archaeological areas (Sites I - XII), have been identified during the assessment, principally sites identified during the fieldwork programme . The earliest activity to be identified is Palaeolithic in date, a minimum of five distinct Iron Age settlements have been identified (Sites II, IV-VI & XII). Five Romano-British settlements have also been identified. Only one archaeological feature yielded Anglo-Saxon material, a pit at Site V on the ridge gravels opposite the cemetery site of that date excavated within the grounds of Girton College.

Evidence of the Howes Close medieval settlement (known from documentary records; Site IX) was found, as was evidence related to Cambridge's Medieval West Fields in the form of traces of ridge-and-furrow agriculture and a track way (Site VIII). Upon the gravel ridge, features relating to a similar medieval route way and a hedged paddock were found (Sites II & III).

No statutory or locally designated (archaeological) heritage assets lie within the Application Site. Based on current evidence it is unlikely that surviving buried archaeological remains (or associated artefacts) will be of such importance to warrant statutory designation and as a result thus be worthy of preservation on site.

Consideration of significant effects on the identified archaeological resource has nevertheless been undertaken.

The Proposed Development will have a **negligible to major Adverse** effect on buried archaeological remains within the Application Site. The effects range from Major Adverse for sites IV and V, to Moderate Adverse for sites I, II, X and XII, Minor Adverse for sites III and XI and Negligible for sites VI to IX inclusive. However, the Proposed Development would not conflict with national or local policy regarding the safeguarding of heritage assets and none of the identified effects are of such significance that they should preclude the Proposed Development.

In respect of cumulative effects, the proposed development of the Application Site, and both the NIAB and West Cambridge developments, will result in development above and around similar types of archaeological sites within the north western quadrant of Cambridge. Whilst some archaeological sites will be developed as part of this process, it is anticipated that schemes of archaeological works will be enacted in advance of and during construction operations for all of the strategic sites and the developments will adhere to industry standards and guidance so that the cumulative effect of the Proposed Development and the other strategic sites listed will be **negligible**. The excavation of Iron Age/Roman settlements at West Cambridge, the excavation of the two main NIAB sites of the same date, the excavation of North West Cambridge's main site complexes (Sites II, IV & V) will greatly increase understanding of the periods' settlement systems within this area of Cambridge's hinterland. This will provide much better understanding, an appreciation of late prehistoric/Roman land-use and the local historic landscape sequence and must therefore count as a positive heritage benefit.

Cultural Heritage

The historic landscape and pattern of development in and around the Application Site has been considered and analysed in relation to its importance to the city of Cambridge. The contribution made by the Application Site to the historic landscape has been assessed.

A number of designated and non-designated heritage assets stand in proximity to the Application Site. The significance of these heritage assets and their settings (as listed below) has been assessed:

- three Grade II* listed buildings;
- 22 Grade II listed buildings;
- three existing conservation areas;
- one proposed new conservation area;
- 33 locally listed buildings; and
- undesignated farm buildings within the Application Site.

Approach

This assessment examines the contribution the Application Site makes to the significance of each of these heritage assets and setting. In making these assessments, full regard has been paid to the relevant policy framework in relation to the historic environment.

Analysis, informed by historical background research, has been used to inform the assessment, coupled with site visits in the summer and winter months to every heritage asset within the study area. Professional judgement used to assess the magnitude of effect on each of these assets.

The significance of effects has been assessed by taking into account the sensitivity of the heritage assets and the extent to which they would be affected by the construction and operation phases of the Proposed Development. The sensitivity of the heritage assets is dependent on factors such as the heritage value of the asset. Magnitude of effect is a function of the nature, scale and type of disturbance, or damage, to the heritage asset.

Assessment

The effects of construction activity on listed buildings and their settings and on conservation areas and locally listed buildings will be indirect and temporary. There will be no direct physical effects on any of these built heritage assets but indirect and temporary effects on them and their settings may arise from construction noise and dust.

Similarly, there is also potential for construction activity to have an effect on views to and from listed and locally listed buildings and conservation areas - views may be affected by the presence of construction equipment (such as cranes and other machinery) in the short to medium term. There will be similar temporary effects relating to the proposed highway and utility works on Huntingdon Road and Madingley Road and to the provision of a 450mm diameter potable water main extension.

It is considered that during the constructional phase of the Proposed Development, the likely effects on physical features of the historic landscape of the Application Site and the wider historic landscape will range from **minor adverse to minor/moderate adverse**, while the effects on the settings of listed buildings, existing and proposed conservation areas and locally listed buildings will range from **negligible to minor/moderate averse**. The **minor/ moderate** effects will be to the Ascension Burial Ground Chapel within the Storey's Way Conservation Area and Clements End and Conduit Rise within the Conduit Head Road Conservation Area. These effects will be indirect and temporary. Permanent effects arising from this phase relate to the demolition of a small number of non-designated farm buildings of low significance within the Application Site, resulting in a **moderate adverse** effect.

During the operational phases (at years 2014 and 2026) the effects are likely to range from **negligible to a minor/ moderate adverse** effect on the Ascension Burial Ground Chapel within the Storey's Way Conservation Area, arising from on-going construction activity at the 2014 stage. There will continue to be construction activity on the Application Site in 2014 and this has been taken into account in the analysis of effects. A **minor adverse** effect on the wider historic landscape is also identified, arising from the introduction of development on agricultural land and the creation of a new 'urban edge'.

During the operational phases (at years 2014 and 2026) the effects are likely to range from **negligible** to **minor/moderate adverse** and influenced by mitigation incorporated within the design of the Proposed Development.

No significant cumulative effects with other developments are likely. The development at Northstowe is simply too far away to contribute to any cumulative effect on heritage assets in the vicinity of the Proposed Development. Likewise, the Orchard Park site has no direct relationship with the heritage assets assessed here. In relation to NIAB1 and West Cambridge, it is unlikely that they will be seen in combination with the Proposed Development. While these three developments in combination with NIAB2 will cumulatively increase the density of development on the north-west side of Cambridge, this will not have any significant cumulative effect on the heritage assets assessed, which already lie within a built-up area defined by the A14, M11 and Huntingdon Road.

Agricultural Circumstances

The ES includes an assessment of the effects of the Proposed Development on agricultural interests.

The Application Site extends to approximately 150ha. The majority of the land (125ha) is in agricultural production for arable crops and grassland, and there are two sets of farm buildings located at either end of the Application Site. A detailed field survey to determine the agricultural land classification of the Application Site has been carried out, along with interviews of the University farm business manager.

A detailed soil survey has been carried out using the DEFRA Agricultural Land Classification which subdivides soils into 5 grades (1-5). Grades 1-3 are regarded as "best and most versatile". The survey has identified that the majority of the land within the Application Site is classified as best and most versatile agricultural land in Grade 2 (6ha) and Subgrade 3a (107ha), with 12ha classified as lower quality Subgrade 3b.

A single agricultural business would be affected by the Proposed Development. The University of Cambridge Farm manages over 1,000ha in the locality, with four separate farmsteads. The majority of the land within the Application Site farmed is planted with arable crops, but there are also sizeable livestock enterprises including a 200-cow dairy herd (expected to rise to 250 cows) and a 220-ewe sheep flock.

By 2026 the Proposed Development would result in the permanent loss of 125ha of land from agricultural production, with a further 32ha remaining as open space. This land includes 79ha of land classified as best and most versatile in Grade 2 (6ha) and Subgrade 3a (73ha). Whilst the loss of this land is a **major adverse** effect of the Proposed Development, its loss has nevertheless already been weighed in the balance by the local planning authorities and the Planning Inspectors further to the allocation of the Application Site for redevelopment in the Area Action Plan (AAP). Similarly, although the Proposed Development would be phased, by 2014 some 46ha of land classified as best and most versatile would already have been affected and such loss is assessed as **major adverse**, but again subject to the allocation under the AAP.

The University of Cambridge Farm will, over the phased lifetime of the Proposed Development, lose the use of 125ha of agricultural land. This represents 12% of the total area farmed by the University and would normally be expected to have a marked effect on the profitability of a farm. In this instance the University has already purchased replacement land at Lolworth, and obtained replacement land near Maddingley; investment in new farm buildings will be made shortly, and further investment is forecast. Taking this into account, the effect on the farming business in 2014 is assessed as **minor adverse** reducing to **negligible** by 2026.

Other major developments will result in the loss of best and most versatile agricultural land (which are identified in Chapter 1 of this ES), but all such developments are discrete and the loss of such land has been (or will be) considered individually when planning permission is granted.

The ES for the Northstowe development identified the loss of 221ha of best and most versatile land, which was considered to be an effect of major adverse significance. That for the NIAB identified the loss of nearly 40ha of best and most versatile land, which was considered to be an adverse effect of moderate significance. In overall terms when all committed developments are completed as at 2014 and 2026 there will be a significant net loss of best and most versatile agricultural land (of approximately 340ha) but this has been considered already through the forward planning process in which each of these sites has been allocated for major development.

Traffic and Transport

In the ES, the effect of the Proposed Development on the transport network, of itself and cumulatively with other developments in the area has been considered. The ES considers the environmental effects of traffic associated with the Proposed Development.

Traffic and transportation issues in terms of number of vehicles likely to be on the road network and the effects of those numbers in terms of traffic flows and congestion are considered in a separate Transport Assessment and summarised in the Non-Technical Summary to that Assessment.

For ease of reference, the structure of this section of the NTS is as follows:

- Scope of assessment
- Proposed Development
- Traffic Associated with the Proposed Development
- 2014 Pre-opening
- 2014 Post-opening
- 2026
- Assessment of effects
- Severance, pedestrian amenity, fear and intimidation and highway safety
- Pedestrian and driver delay

Scope

In accordance with practice guidance from the IEMA, the ES considers the following potential environmental effects an the degree to which the Proposed Development would be likely to give rise to them :

- severance - i.e. the perceived division that can occur within a community when it becomes separated by a major traffic artery.
- pedestrian amenity - broadly defined as the relative pleasantness of a journey;
- fear and intimidation - the effect of which is dependent upon the volume of traffic, its HGV composition, its proximity to people or the lack of protection caused by such factors as narrow pavement widths. Receptors are assessed as being pedestrians and cyclists;
- accidents and safety;
- hazardous loads; and
- pedestrian and driver delay.

The ES considers whether they would be likely to arise within two 2014 scenarios (before an after opening of the local centre) and in 2026, when the Proposed Development would be complete. It reviews effects associated with construction traffic and operational traffic associated with the Proposed Development. It also looks at those matters cumulatively with the NIAB and West Cambridge Developments.

Proposed Development

A number of measures have been proposed in connection with the Proposed Development in order to avoid, reduce or manage traffic generation and to create a safe secure environment for cyclists and pedestrians during both the construction and operational phases, These are outlined below and are assumed to be integral to the Proposed Development for the purpose of the assessment has been carried out.

CEMP

During the construction phase, a Construction Environment Management Plan is proposed. This would impose controls on construction traffic as follows:

- control of routes into the Development – to ensure the delivery vehicles avoid sensitive areas in Cambridge
- control of the hours of delivery – whilst only a very limited number of car and HGV construction movements typically occur during the peak hours, construction movements will be controlled during these hours
- design and routeing of services and drainage to take account of the potential for construction work to cause congestion of local highways
- co-ordinating the Development works – for example, installing more than one utility company's apparatus simultaneously in a section to avoid having to re-install traffic management at any one location
- co-ordination of these development-related works with works elsewhere on the network being undertaken by other developers and organisations, to prevent two parallel routes being affected simultaneously
- consideration of working anti-social hours where the number of sensitive receptors is limited (such as to the west of the proposed Site Accesses adjacent the motorway), to reduce the overall duration of the works
- possible means of removing construction-related traffic management during the peak hours, to re-open the road and minimise the effects upon the surrounding highway network;
- installing intelligent traffic light controllers or using manually controlled light controllers to minimise any inefficient use of green time.

Transport Strategy

- In relation to operation of the Proposed Development the Transport Strategy provides for the following:
- measures to reduce vehicle trips across the strategic and local highway network
- measures to preserve / enhance capacity on the network
- measures to improve public transport service to the Application Site
- trip demand management measures
- enhancements to pedestrian and cyclist infrastructure

A Development Travel Plan is integral to the Transport Strategy, This will: promote alternative means of travel to the car and will establish proposals which the University will apply to occupiers of the Proposed Development. Measures in the Framework Travel Plan will include the promotion of car sharing, the Development public transport service, a wide range of measures to improve walking and cycling, and measures to increase the numbers of residents working from home.

Improvements directed at improved connectivity and safety for pedestrians and cyclists

The Application includes, as part of the Proposed Development (in addition to pedestrian and cycle provision within Zone B of the Application Site):

- extensions to the existing footpaths and cycleways along Huntingdon Road and Madingley Road to link to the accesses to the Development
- improved cycle road signs and markings along the existing footpaths and cycleways along Huntingdon Road into the City
- better pedestrian crossing and cycle facilities through the Huntingdon Road / Victoria Road / Castle Street junction
- new cycling and pedestrian crossings at all entrances into the development along Huntingdon and Madingley Roads as well as an additional cycle crossing linking to Whitehouse Lane.

Traffic associated with the Proposed Development and operation of nearby roads and junctions as at 2014 and 2026

2014 Pre-opening

During the 2014 Pre-opening scenario, in addition to Phase 1 of the Proposed Development being under development, highways and utility works on Huntingdon Road and Madingley Road associated with the Proposed Development would be underway and construction works associated with the West Cambridge and NIAB developments would also be underway. Elements of development at the West Cambridge and NIAB developments would be occupied. Construction access to Zone B of the Proposed Development would be taken from Madingley Road.

The greatest peak construction traffic effect would be on Madingley Road between the Park and Ride entrance and the M11, with daily flows increasing by 3%, and Heavy Goods Vehicle (HGVs) increasing by 60% (4% and 64% in the cumulative assessment).

There would also be construction effects on traffic flows on Huntingdon Road and Madingley Road as a consequence of construction of highway and infrastructure works on those roads.

2014 Post-opening

Under the 2014 Post-opening scenario, improvements in the form of new signalised junctions, pedestrian and cycle crossings and improved pedestrian and cycle facilities on Huntingdon Road and Madingley Road will have been completed. Phase 1 of the Proposed Development including up to 600 dwellings and a local centre including food store would be occupied. The NIAB 1 development would be partially built and occupied as would West Cambridge. Construction vehicle access to the Proposed Development would still be via Madingley Road. Highways an utility works to Huntingdon Road and Madingley Road would have been completed.

The assessment of 2014 Post-Opening traffic conditions identifies that:

- the highest traffic flow percentage increases on the surrounding network as a consequence of the Phase 1 Development would occur on Huntingdon Road, between the A14 and the Site Access. Increases of 16% would be expected.
- the maximum effect of the peak Construction traffic effect is again on Madingley Road between the Park and Ride entrance and the M11, with daily flows increasing by 14%, and HGVs increasing by 68% with a further 318 2-way HGV movements.
- taking into account the construction activity at NIAB and West Cambridge, the greatest effect would again be on Madingley Road between the Park and Ride entrance and the M11, with cumulative daily flows increasing by 14% and HGVs increasing by 79%.
- on all other routes in the area, the increase in traffic / HGVs resulting from the construction activity would be negligible

2026

As at 2026, all construction on the Proposed Development, NIAB and West Cambridge would have been completed and each would be fully operational. In common with the 2014 Post Opening Scenario, improvements to Huntingdon Road and Madingley Road and to pedestrian, equestrian and cyclist facilities would have been completed.

The majority of the changes in flows as a consequence of the Proposed Development are small single figure percentage increases, many of which are less than 1% - there are indeed a number of links with flow reductions as a result of reassignments from existing roads.

Only four roads or sections of road would have changes in flow higher than 10% - Huntingdon Road West of the Site Access, NIAB (Southern End), Girton Road and Oxford Road/ Windsor Road.

Junction capacity assessments have confirmed that in 2026 junctions along the Huntingdon Road and Madingley Road corridors would operate within their capacity and so would the three new junctions providing access and egress between Huntingdon Road and Madingley Road and the Proposed Development.

Where the Cambridge Sub Regional Model identified that the Proposed Development has an effect in terms of increased delay on other junctions in the vicinity, assessments have been undertaken to these junctions. The results of these junction capacity assessments show that the influence of the Proposed Development is minimal, and that the existing junctions would not experience any significant additional delays.

The effects of NIAB, West Cambridge, Orchard Park and a variety of other "growth area" developments planned in the Cambridge Area are taken into account in the Cambridge Sub Regional Traffic Model as used for assessing traffic effects. Therefore, the effects mentioned above are cumulative as between the Proposed Development and these other developments.

Assessment of Effects

Severance, pedestrian an cyclist amenity, fear and intimidation and Highway Safety

2014 pre opening

The most significant effects are likely to be in relation to Pedestrian Amenity (and possibly Fear and Intimidation) for the short section of Madingley Road between the M11 and the site access, on the basis that HGVs may increase by 64%. Even so, the levels of increase in traffic are well below IEMA guideline thresholds for significance and on Madingley Road between the Site Access and the M11, there are only low sensitivity receptors, and only very few pedestrians and cyclists. Therefore there would be **negligible or (at worst) minor adverse** effects in terms of severance, pedestrian an cyclist amenity and fear an intimidation.

Although the HGV composition along Madingley Road would be higher than existing due to the levels of construction traffic, since this affects road sections with only low numbers of pedestrians and cyclists. For all other roads, effects on traffic composition would be minimal. Therefore the Proposed Development has been assessed as having minimal effect on highway safety.

2014 Post-Opening

For this period, the road most closely affected would be Madingley Road between the M11 an the Site Access. Flows and numbers of HGVs would not be materially different from the 2014 Pre-Opening Scenario. Improvements to both pedestrian an cyclist crossing facilities would be in place on Huntingdon Road and Madingley Road as too would new cycle ways. At worst the effects would be the same **(therefore negligible or (at worst) minor adverse)** taking account the effect of improvements the effects would more likely be **minor to moderate beneficial**.

There is one exception to the above analysis. Fear and Intimidation on the Oxford Road and Windsor Road link has been assessed as **moderate adverse** as a consequence of the traffic modelling suggesting a high increase in the number of vehicles using it - perhaps to avoid increased traffic levels on Huntingdon Road. Measures in the form of traffic calming are proposed by the Applicant along this link to encourage traffic not to use it.

By reason of improved segregated pedestrian an cycle ways and crossings, and signalised junctions there would be a **minor to moderate beneficial** effect on highway safety.

2026

By 2026, the full range of pedestrian an cycle improvement and safety measures and of Travel Plan measures associate with the Proposed Development would have been implemented. On this basis, to be implemented, **minor or moderate beneficial** effects were considered for Severance, Pedestrian Delay, Effect on Pedestrian and Cyclist Amenity, Fear and Intimidation and Highway Safety.

Cumulative assessments

The effects of the NIAB and West Cambridge Developments are inherent in the above analyses, with no change in overall effects.

Pedestrian, Driver, and Cyclist Delay

2014 Pre-Opening

There could be expected to be Driver delay but not necessarily pedestrian or cyclist delay associated with the Proposed Development at this time as a result of congestion resulting from highway and utility construction works on Madingley Road and Huntingdon Road.

2014 Post-Opening

For the Proposed Development in the 2014 post opening scenario, traffic effects would therefore have at worst a **negligible** effect on Driver Delay. The fact of incorporation of pedestrian and cyclist crossing facilities in respect of Huntingdon Road and Madingley Road would result in **minor to moderate beneficial** effects on pedestrian and cyclist delay.

2026

The predicted peak hour journey time along Huntingdon Road would increase by approximately 45 seconds in the AM peak – the two new traffic signalised access junctions would account for much of this increase. Indeed, these signalised junctions will slow traffic moving along Huntingdon Road, helping to enforce the proposed lower speed limit of 40mph, improving the road safety conditions along this section of road

The predicted peak hour journey time along Madingley Road would increase by approximately 50 seconds in the AM peak, although the average journey time increase in both directions in both peaks is around 23 seconds - the revised traffic signalised access junctions would account for part of this increase. The revised signalised junction arrangement will improve conditions along Madingley Road, the slower traffic improving the road safety conditions along this section of road

For the Proposed Development as completed in 2026, traffic effects would therefore have at worst a **negligible** effect on Driver Delay. The fact of incorporation of pedestrian and cyclist crossing facilities in respect of Huntingdon Road and Madingley Road would result in **minor to moderate beneficial** effects on pedestrian and cyclist delay.

Noise Environment

The ES includes an assessment of the likely significant noise and vibration effects associated with the construction, and subsequent operation, of the Proposed Development. The assessment considers the suitability of the site for the proposed uses, construction noise and vibration effects, changes in traffic noise levels on the local road network as a result of the development and operational noise generated by the proposed uses of the Application Site itself.

Suitability of the Site

The noise climate across the Application Site is dominated by road traffic on the M11 motorway, with smaller local contributions from the A14 and other surrounding roads.

For both 2014 and 2026 assessment years, noise level contours across the Application Site have been calculated.

It has been concluded that the Proposed Development, as shown in the Parameter Plans, could be developed within the Development Parameters to provide an acceptable noise climate across the Application Site.

Construction Noise and Vibration Effects

It has been assessed that noise and vibration during all construction works can be effectively managed using precautions set out in the Construction Environment Management Plan proposed in connection with the Proposed Development to result in **negligible** effects to on-site and off-site receptors.

Construction noise associated with works to Huntingdon Road and Madingley Road are mentioned in comments on cumulative effects; as are effects of 2014 post opening operational traffic related noise.

Table 2

Change in Noise Level (dB)	Sensitivity of Receptor			
	High	Medium	Low	Negligible
> 5	Major	Moderate/Major	Moderate	Negligible
3 < 5	Moderate	Minor/Moderate	Minor	Negligible
1 < 3	Minor	Negligible/ Minor	Negligible	Negligible
< 1	Negligible	Negligible	Negligible	Negligible

Changes in Traffic related noise levels

Assessment of traffic related noise has used the thresholds in Table 2 as the basis of levels of significance when measured at the nearest building façade to the relevant road.

Research shows that changes in road traffic noise levels of 1dB(A) or less are imperceptible, and changes of up to 3dB(A) are required to be perceptible.

Hence the following criteria have been used to assess magnitudes of effect for the purpose of Table 3 opposite.

For the purpose of gauging sensitivity of receptors: schools an residential premises have been taken as being of high sensitivity an offices to be of medium sensitivity.

The effect of changes in road traffic noise levels resulting from the Proposed Development has been assessed. Two existing residential streets, namely Oxford Road and Windsor Road will experience increases in noise level of approximately 1.5 dB(A). The significance of this increase is assessed as **minor adverse** for the year 2026. Changes in noise level on all other roads in the locality will be **negligible**.

With respect to residential properties on Huntingdon Road, All Souls Lane and Conduit Head Road which back on to the Application Site, the vast majority of these will experience reductions in noise levels to their rear facades with the development in place. This is as a result of the shielding provided by the development buildings to noise from the M11 motorway. This effect is assessed as **moderate beneficial**.

Change in Noise Level (dB)	Subjective Response	Magnitude of the Effect
< 1	None	Negligible
1 < 3	Perceptible	Minor
3 < 5	Noticeable	Moderate
> 5	Intrusive	Major

Table 3

Four properties to the Huntingdon Road East access will experience increases in noise levels of 1 to 3 dB(A) to some facades resulting from traffic accessing and leaving the Application Site. This is assessed as a **minor adverse** effect. However, if deemed necessary a strip of land can be landscaped to provide a noise barrier to reduce this effect.

Three properties adjacent to the development site access on Madingley Road will experience increases in noise levels of up to 1 dB(A) to some facades resulting from traffic accessing and leaving the Application Site. This is assessed as a **negligible** effect.

Energy Centre, Fixed Plant, Operation of the Supermarket and Retail Units and use of Outdoor Space

An assessment of noise from the Energy Centre and fixed plant associated with the Proposed Development, the operation of the supermarket and retail outlets and the use of the school outdoor area and other open land has been carried out.

The Energy Centre and fixed plant associated with buildings within the Proposed Development will be designed and attenuated such that the significance of noise effects to sensitive receptors in the vicinity (essentially within the Proposed Development itself) will be **negligible**.

Management of HGV deliveries to the supermarket and other retail outlets, stipulating delivery times and procedures (e.g. maximum speeds and not parking up on site with engines idling) would result in the significance of these effects being **negligible**.

Noise breakout from retail outlets, affecting nearby residential units forming part of the Propose Development, will be controlled in a similar way through the effective management of procedures (e.g. control of music levels and door management).

Where residential properties share a party wall or floor with retail / commercial properties, the dividing/separating partitions or structures will provide sufficient attenuation for the intended uses of the commercial properties, to provide the required internal noise levels to residential properties.

Activity in the areas of open land associated with the Local Centre is likely to be fairly limited for most of the time. Other activities involving outdoor entertainment and formal and informal games will require management to minimise noise disturbance to nearby residents.

Noise from the school outdoor area will only occur during limited times of the day during normal school hours. It is unlikely that the school play area will be considered by nearby residents as a significant disturbance.

Activity in the areas of open land to the west of the Application Site is likely to be fairly limited for most of the time, mainly confined to walkers and naturalists. This will not be considered by residents as a significant disturbance. Sports pitches located in this area have the potential to result in a degree of disturbance to the nearest residential properties. As for activities on other areas of open land, management should result in a **negligible** effect.

Cumulative effects

On-site construction works

In respect of cumulative effects of on-site construction works at the developments at Northstowe, Orchard/ Arbury Park and NIAB2 are too distant from the Proposed Development for there to be any significant cumulative effects during the Phase 1 works completed in 2014 or the Phase 2, 3 and 4 works up to 2026.

There is the potential for significant cumulative effects at properties on Madingley Road and Huntingdon Road resulting from on-site construction works at West Cambridge and NIAB, when these works are at their closest approach to the Proposed Development.

The on-site Phase 1 works for the Proposed Development up to 2014 will generally be at considerable distances from these roads and construction noise levels will be negligible. Therefore, any cumulative effect will be negligible. During highways and utilities works on Huntingdon Road and Madingley Road, there is the potential for significant cumulative effects at properties on Madingley Road and Huntingdon Road. However, taking into account the speed at which the utilities works will progress (approx. 20 metres per day), the duration of these significant effects at any particular sensitive receptor will be small.

Taking into account the fact that noise from the West Cambridge and NIAB developments will affect the front facades of properties on Huntingdon Road and Madingley Road, whereas noise from the Proposed Development will affect rear facades, and the **negligible** effects of construction noise from the Proposed Development in 2026, the cumulative effect is likely to be **negligible** in Phases 2, 3 and 4 of the construction works.

Combined construction traffic

Employing the results provided in the traffic and access chapter, the increases in noise levels to receptors fronting Madingley Road and Huntingdon Road resulting from the combined construction traffic for the Application Site, West Cambridge and NIAB, have been calculated.

For the pre-2014 works, receptors fronting Madingley Road will experience noise increases of 0.5 dB(A) as a result of the additional construction traffic. Receptors fronting Huntingdon Road will experience noise increases of 0.3 dB(A) as a result of the additional construction traffic. The significance of these noise increases is assessed as **negligible**.

For the post-2014 works, receptors fronting Madingley Road will experience noise increases of 0.6 dB(A) as a result of the additional construction traffic. The significance of this noise increase is assessed as **negligible**. Receptors fronting Huntingdon Road will experience no increase in noise levels as there will be no construction traffic on this road.

Incorporating the additional traffic on Madingley Road due to the operation of the proposed development post-2014, the increase in noise levels to receptors fronting Madingley Road is 1.0 dB(A). The significance of this noise change is assessed as **negligible/minor adverse**.

Hence, the significance of the cumulative effects of construction traffic for the Application Site, West Cambridge and NIAB, and operational development traffic post-2014, is assessed as **negligible**.

Combined operational traffic

The transportation modelling, undertaken as part of the Transport Assessment, has estimated the cumulative effect for operation of all the Schemes considered in the cumulative traffic assessment.

The developments at Northstowe, Orchard/Arbury Park, West Cambridge, NIAB and NIAB2 are too distant from the Proposed Development for there to be any significant cumulative effects resulting from on-site operational noise for both 2014 and 2026.

Overall the cumulative effect of the Proposed Development and the other schemes in the Cambridgeshire Growth Areas is assessed as **negligible** in 2014 and in 2026.

Air Quality

An assessment has been undertaken in the ES of the likely significant effects on local air quality associated with the construction, and subsequent operation, of the Proposed Development.

During construction there is the potential for construction and site clearance works to generate airborne particulate matter in the form of dust and finer particulate matter that could adversely affect amenity and health at properties near to the works. The effectiveness of good working practices as a means of preventing particulate matter from construction works causing such adverse effects has been considered and found that the required standard of protection is readily achievable. The Construction Environmental Management Plan would provide the means of preventing limiting or managing any adverse effects so far as practicable.

During each phase of the works, if dust generating activities are subject to the dust suppression measures proposed in the Construction Environmental Management Plan, then the effects on residential receptors would be **negligible**. Residential properties within 50m of the site boundary may experience an occasional increase in local dust-soiling rates during times when activities are carried out close by in extremely dry and windy weather. Any such effects would be restricted to short-term episodes affecting a small number of properties and would be of **minor adverse** significance. These effects are not expected to carry a risk to health.

Approach

With regard to road traffic emissions, the baseline and with development effects of road traffic exhaust emission at locations close to the local road network have been modelled in detail and the predicted changes in pollutant concentrations assessed.

The principal assessment criteria are whether or not the local authorities' air quality objective values for the following pollutants would be met. A microgram is equivalent to one millionth of a gram or one thousandth of a milligram:

- Annual mean nitrogen dioxide (NO2) concentration of 40 micrograms per cubic metre of air
- Annual mean particulate matter (PM10) concentration of 40 micrograms per cubic metre of air
- Annual mean fine particulate matter (PM2.5) concentrations of 25 micrograms per cubic metre of air
- 24-hour mean PM10 concentration of 50 micrograms per cubic metre of air not to be exceeded on more than 35 days per year

The achievement of local authority goals for local air quality management are directly linked to the achievement of the air quality objective values described above and as such this assessment focuses on the likelihood of future achievement of the air quality objective values.

In addition, consideration is given to the potential for effects to interfere with, prevent or support the successful implementation of measures listed within the Air Quality Action Plan for the Cambridgeshire Growth Areas.

2014 Pre-opening

During the early construction phases of the Proposed Development while highways and utility works to Huntingon Road and/or Madingley Road and construction works on the main elements of the Proposed Development will be underway (2014 Pre-opening), the majority of construction traffic would use junction 13 of the M11 and egress the site from the access point on Madingley Road. Between this site entrance point and junction 13 of the M11 motorway there are very few sensitive receptors, and those present are all set well back from the highway. As such, any effects on air quality associated with the additional construction related vehicle movements of the Proposed Development on Madingley Road and Huntingdon Road would be **negligible**.

Works to Madingley Road and to Huntingdon Road and works for utilities will affect the normal operation of Madingley Road and Huntingdon Road for the duration of the works. The phasing of works will be agreed with the local transport authority to ensure that effects on the network as a whole are managed and this in turn will manage the scale of any additional road traffic emissions of air pollutants.

2014 Post-opening

In the later phases (2014 Post-opening) after works on Maingley Road and Huntingdon Road are complete the local centre at the Proposed Development has opened and dwellings have begun to be occupied an the school to be used but construction works on the main elements of the Proposed Development would be continuing, , there would be no vehicle movements associated with the construction of this development on Huntingdon Road. Instead, all construction traffic would use the site egress on Madingley Road via junction 13 of the M11 motorway. Again, any effects on air quality associated with additional construction related vehicle movements at the sensitive areas on this route would be **negligible**.

In relation to effects of traffic associated with the operation of the Proposed Development, the Proposed Development has been designed to locate buildings away from the boundary with the M11 and hence limit potential receptors within buildings being exposed to any road traffic emissions from this source.

In relation to the change in pollutant concentrations in the 2014 post opening scenario, the magnitude of the effects of the additional road traffic exhaust emissions associated with the operation of Phase 1 of the Proposed Development and construction traffic for Phase 2 are unlikely to be large enough to be capable of causing a perceptible change in particulate matter concentrations.

The corresponding effects on annual mean concentrations of nitrogen dioxide are likely to be small to imperceptible at receptors along Madingley Road, along Huntingdon Road (save for a single receptor outside the Proposed Development), along Histon Road and at a number of locations towards the city centre . A medium magnitude of change in annual mean concentrations of nitrogen dioxide is predicted to occur at a single receptor outside the Proposed Development on Huntingdon Road (Hollies Nurseries) and also at two locations within the middle of the Proposed Development. None of these effects are likely to raise baseline concentrations to a level (> 36 micrograms/m^3) where the objective could be considered to be at risk of being exceeded unless they were already above this value. The effect of changes of this magnitude on air quality sensitive receptors would therefore, be **negligible** at the majority of receptors although where the baseline concentrations are already elevated a **minor adverse** effect is predicted.

2026

The baseline air pollutant concentrations in 2026 are very likely to be well below the respective objective values at all existing and proposed receptors. The effects of the additional road traffic exhaust emissions would be small to imperceptible in magnitude. Effects of this magnitude would have a **negligible** effect at the air quality sensitive receptors within the study area.

In 2026 no exceedances of the annual mean objective values for nitrogen dioxide, PM10 or PM2.5 are likely to occur with or without the Proposed Development, at any receptor in the study area. No exceedances of the 24 hour mean objective for PM10 are likely to occur with or without the Proposed Development, at any receptor in the study area.

The magnitude of the effects from road traffic exhaust emissions, on particulate matter concentrations would be imperceptible at all receptors apart from two locations within the proposed development (the far north-west corner of the Application Site and a site opposite the Western Edge). The corresponding effects on annual mean concentrations of nitrogen dioxide would also be imperceptible at receptors along Madingley Road and along the majority of Huntingdon Road). A small magnitude of change in annual mean concentrations of nitrogen dioxide is predicted to occur adjacent to the site access on Huntingdon Road, at the southern end of Histon Road and at three locations within the central part of the proposed development.

Adverse effects on annual mean concentrations of nitrogen dioxide would be low to imperceptible in magnitude at some receptors, but none of these effects would raise baseline concentrations to a level (> 36 micrograms/m3) where the objective could be considered to be at risk of being exceeded. These low to imperceptible effects are most likely to occur at properties facing onto Histon Road, on Huntingdon Road nearest the junction with the new site link road . The completed Proposed Development in 2026 would contribute to small to imperceptible increases in annual mean concentrations of nitrogen dioxide at properties on Histon Road and Huntingdon Road close to the junction with the ring road.

Overall conclusions

The overall conclusions of the assessment are that future year baseline air quality is very likely to improve relative to current baseline conditions and that in 2014 and 2026, the effect of the completed scheme on local air quality would be **negligible**.

The Proposed Development would include plant to provide electricity and hot water by burning gas. The combined effects of emissions from the energy plant and the emissions from road traffic has be en considered in this assessment and the magnitude of the combined effects assessed.

The overall conclusions of the assessment are that future year baseline air quality is very likely to improve relative to current baseline conditions and that in 2014 and 2026, the effect of the completed scheme on local air quality would be **negligible**.

Cumulative effects

In respect of Cumulative effects construction works only have the potential to cause significant adverse effects at receptors located within a few hundred metres and with measures, such as those required by South Cambridgeshire District Council or Cambridge City Council, the zone within which significant effects might occur reduces to less than fifty metres. The developments at Northstowe, West Cambridge, Orchard/Ardbury Park or NIAB2 are too distant from each other for there to be any potential of on-site works resulting in significant cumulative effects.

On-site construction works

On-site works for the Proposed Development and the NIAB scheme both have the potential to affect rates of dust deposition at a small number of properties on Huntingdon Road. As the Proposed Development and the NIAB scheme are located on different sides of Huntingdon Road, it is highly unlikely that combined effects would occur simultaneously. Works associated with highways and utility works on Huntingdon Road have the potential for **minor adverse** cumulative effects but there are opportunities to reduce the potential duration and magnitude of such effects by co-ordinated scheduling of off-site works for the schemes.

On-site works for the Proposed Development and the West Cambridge scheme both have the potential to affect rates of dust deposition at a small number of properties on Madingley Road. As the Proposed Development and the West Cambridge Development are located on different sides of Madingley Road, it is highly unlikely that combined effects would occur simultaneously. Off-site works associated with infrastructure and utility works have the potential for **minor adverse** cumulative effects but there are opportunities to reduce the potential duration and magnitude of such effects by co-ordinated scheduling of off-site works for the schemes.

Construction vehicle movements

Traffic information confirms that the majority of construction vehicle movements associated with the Proposed Development would use the stretch of Madingley Road between the site access and junction 13 of the M11. The majority of construction vehicle movements associated with other developments at the same time would be on Huntingdon Road. As such, the cumulative effects of construction traffic on air quality sensitive receptors would be **negligible**.

Operational movements

The transportation modelling, undertaken as part of the Transport Assessment, has estimated the cumulative effects of all the strategic schemes on traffic flows on the local network of roads. Therefore the effects of operational traffic associated with other developments would be integral with those of assessments of operational traffic associate with the Proposed Development. Overall the cumulative effect of operational traffic deriving from the Proposed Development and the other schemes in the Cambridgeshire Growth Areas would be **negligible** in 2014 and in 2026.

Hydrology, Drainage and Flood Risk

The ES includes an assessment of the likely effects of the Proposed Development on flood risk and water resources.

The Proposed Development is located within the headwaters of the Washpit Brook (a tributary of the Cottenham Lode / Beck Brook catchment). The Washpit Brook flows in a northwest direction through the southern area of the Application Site and then along the western boundary; it has a number of small field rains crossing the Site discharging into it. Downstream of the Application Site it becomes designated as Main River.

The Environment Agency's on line flood maps indicate that the Application Site is located within Flood Zone 1 and therefore unlikely to be subject to flooding even once in a 1000 years. However, further hydraulic modelling has been undertaken on the Washpit Brook as part of the Site Specific Flood Risk Assessment has identified areas of the Site adjoining the watercourse that appear to be in Flood Zones 2 and 3. These flood risk zones are associated with the predicted flooding extent from the Washpit Brook during a flooding event with a return period of 1 in 100 years (Flood Zone 3) and a flooding event with a return period of 1 in 100 to 1 in 1000 years (Flood Zone 2). There is a known flood risk to existing development at Girton and further downstream and it is therefore critical that this risk is not increased as a result of the Proposed Development.

The geology underlying the site is variable, broadly consisting of Head Deposits (mainly clays) in the south western half of the Application Site and Head Gravels in the central northern to north eastern areas of the Application Site overlying the Gault Clay Formation (which forms the slopes to the Washpit Brook). In the eastern part of the Application Site, reworked Chalk Marl is locally present in a historic landfill area.

The Application Site is generally rural in nature and does not benefit to any great extent from existing water supply or wastewater infrastructure except to serve the local research and farm facilities belonging to the University. Consideration has been given to the impact of providing new sustainable water services infrastructure to the development as part of this assessment.

Managing construction to protect watercourses

A Construction Environmental Management plan (CEMP) has been produced to confirm best practice policy proposed by the Environment Agency within Pollution Prevention Guidelines. Hazardous substances will be stored within impermeable, bunded areas to remove the risk of migration to groundwater or a nearby watercourse, The measures defined within the CEMP will assist in avoiding or minimising the potential for contaminants and suspended solids to migrate to surface and groundwater, reduce localised flood risk, and protect water quality and the ecosystems the water resources support.

Managing Flood risk

It is a development assumption that development, involving the construction of buildings and raising of ground levels, will only be permitted within the 1 in 100 year floodplain (including climate change) if flood compensation storage is provided to ensure that floodwater is not displaced downstream. Culverts along the route of the existing Washpit Brook will be retained or provided, to ensure that flood risk is not increased downstream and potentially that any flood risk downstream is decreased.

Protecting water quality

A surface water management system will be provided, which will incorporate a system of Sustainable Drainage System (SuDS) and landform elements features to manage any surface water run-off to rates equivalent to those applying before development takes place. These long term storage features will ensure that the volume of water and peak flow rates discharged to the Washpit Brook will not increase. The proposed surface water management system will ensure, firstly, that the development will not increase flood risk; and secondly, that runoff from paved areas at risk from contamination from hydrocarbons will be subject to two levels of treatment. Therefore water quality will not be affected.

Potable water demand

The Proposed Development will comply with Levels 5 and 6 of the Code for Sustainable Homes. Rainwater harvesting and greywater recycling devices will be used in combination with water efficiency measures to permit

the potable water demand to be halved when compared to current annual potable water demand consumption figures.

Wastewater treatment

Anglian Water will make improvements to the Cambridge Waste water Treatment Works (WwTW), as and when required by the Environment Agency. This will involve using investment obtained though its regulatory review process to ensure that the quality of effluent discharged to the River Cam will be maintained.

Overall Assessment

Construction

Potentially adverse effects during the construction phase will be avoided as attenuation ponds within each sub-catchment will be constructed in advance of the associated development to control the discharge rates of surface runoff. Temporary pollution control structures will also be introduced upstream of the ponds to ensure that elevated levels of suspended solids will not be conveyed to local surface water bodies. Haul roads will be constructed to accommodate the movement of vehicles and heavy plant during the construction phase in order to minimise the potential for soil underneath to be compacted leading to increased runoff rate. Rainfall runoff from haul roads will be directed to appropriate temporary pollution control structures before being conveyed to balancing ponds where the discharge to the watercourse will be controlled to greenfield runoff rates.

Operation

Potentially adverse effects during the operational phase of the Proposed Development will be avoided through the provision of a new 3.2km long 450mm diameter reinforcement to the water supply ring main and new booster station. These will improve capacity and water pressure within the local area.

Applications of herbicides to landscaped areas within the Proposed Development will be undertaken during dry periods, in accordance with EA guidelines, to reduce the likelihood of nutrients being conveyed to surface water bodies.

After allowing for the design features built into the Proposed Development and the construction methods under which it will be carried out, the likely significant effects of the Proposed Development in relation to hydrology, drainage and flood risk are considered generally to be **negligible**.

Cumulative Effects

In respect of Cumulative effects on flood risk, since the Proposed Development is situated at the headwaters of the Washpit Brook; the development of other strategic sites identified will not increase flood risk to the Proposed Development.

The Cambridge Area Phase 1 Water Cycle Study indicates that surface water discharge from all developments within the Beck Brook/Cottenham Lode catchment shall be managed by means of flow attenuation and long term storage. This approach will ensure that flood risk will not be increased as a result of the cumulative effect of the Application Site and the development of other strategic sites listed identified.

Hence, the cumulative effect on flood risk will be **negligible**.

In respect of cumulative effects on water resources, the Proposed Development and the other strategic sites identified will impose an additional demand on existing resources. The Cambridge Water Company Water Resource Management Plan indicates that sufficient potable water is available to accommodate the Proposed Development and the other strategic sites, providing that a new 3.2km long 450mm diameter extension to the existing ring main is provided. The Proposed Development will incorporate water efficiency and recycling measures to minimise potable water demand and the same is expected of the other strategic sites. However, in light of the additional demand, unless and until water demand for the Cambridge area reduces in existing development areas, the cumulative effect on water resources has been assessed as **minor adverse**.

Utilities and Services

The ES includes an assessment of the likely significant effects on the existing utility infrastructure associated with the construction, and subsequent operation, of the Proposed Development.

The Proposed Development will require the provision of electricity, gas, water and communications infrastructure. This will be sourced from existing supplies serving the north western area of Cambridge and a baseline assessment has been undertaken to determine the location and capacity of existing utilities situated in the vicinity of the Application Site.

The assessment considers the effect of the Proposed Development on the following utility networks:-

- Electricity
- Gas
- Telecommunications
- Water Supply
- Foul Water

The surface water drainage requirements of the Proposed Development have been assessed separately within the hydrology, drainage and flood risk assessment in Chapter 15 of the ES.

During the Construction Phase, it will be necessary to install new utilities to supply the Proposed Development. Proposed utility supplies will generally be installed along existing road corridors and will therefore not have any adverse effect on ecological, geological or archaeological receptors. Measures will be employed to ensure that traffic is carefully managed when the utility supplies are installed to avoid significant disruption to the local highway network.

Connections to the electricity, gas and telecommunications network are available in close proximity to the proposed signalised junctions on Madingley Road and Huntingdon Road and they may therefore be installed when the junctions are constructed with negligible effect on the performance of the existing highway network. The works associated with the installation of a foul drainage connection and potable water ring main extension are more extensive and the significance of the effects generated by the works has been assessed as outlined below:-

Foul sewer

The 1200mm diameter trunk sewer that forms the outfall for the foul drainage network is situated to the southeast of the Application Site, at a distance of approximately 1300m from the proposed signalised junction on Madingley Road. In order to minimise the effect of works in Madingley Road, the foul discharge from the Proposed Development will be conveyed to the trunk sewer via a shallow pumped rising main, rather than by a deep gravity sewer.

Potable water main

The potable water ring main extension will extend over a length of approximately 3.2km from the 18" main located 1.5km to the south of the Application Site to the existing water mains situated near the Histon junction of the A14 trunk road. In order to minimise the extent of public highway that will be affected during the construction phase, the ring main extension will be laid through the Application Site.

For the remaining lengths, two alternative routes have been identified for the ring main. The preferred route has been identified by Cambridge Water Company and involves using powers under the Water Industry Act 1991 to extend the ring main extension through the West Cambridge development and fields to the south of the Application Site, and through the NIAB development and fields to the north of the Application Site. The alternative route extends along the existing road network, including Barton Road, Grange Road, Madingley Road, Huntingdon Road, Oxford Road and Histon Road. In the event that the alternative route is utilised, then the ring main will be laid within the verge, wherever possible, in order to minimise the requirement for traffic management to be used to allow the road to be partially closed so that the rising main to be installed below the carriageway.

With the measures outlined above, it has been assessed that these utility works can be undertaken with **minor adverse or negligible** effects.

Demand on utilities networks

During operation, the Proposed Development will generate an additional demand on utility infrastructure surrounding the Application Site. Calculations have been prepared to estimate the demand that the Proposed Development will impose upon the existing electricity, gas, potable water and foul sewer networks during the 2014 and 2026 assessment year. Extensive consultations have been held with the Statutory Undertakers, which have indicated that a suitable electricity, gas, potable water and telecommunications supply can be provided to accommodate the full quantum of development, generally in advance of the 2014 assessment year, and that foul water generated by the Proposed Development may be treated . The Proposed Development is therefore expected to have negligible effect on utility infrastructure during the operational phase.

Cumulative effects

In respect of Cumulative effects the North West Cambridge Area Action Plan has been prepared in consultation with key stakeholders involved in the delivery of North West Cambridge and various partnership working arrangements have been in place for the Proposed Development since 2006, including Cambridgeshire County Council, Cambridgeshire Horizons, the Primary Care Trust, the Environment Agency, and the Highways Agency.

Cambridgeshire Horizons' main focus is on the delivery of the development strategy for the Cambridge area. As such, it is assisting the local authorities with mechanisms to ensure prompt and efficient delivery of the major developments and necessary infrastructure. This approach provides utility suppliers with the opportunity to plan and install strategic reinforcements for the utility network that will be capable of accommodating the cumulative demand of all strategic development sites, rather than providing multiple reinforcements for individual developments.

The Phase 1 and Phase 2 Water Cycle Strategies for the Major Growth Areas in and around Cambridge assess the likely significant cumulative effects associated with flood risk, water resources and supply, foul sewerage, wastewater treatment, water quality and water related ecology by considering the Proposed Development in a strategic manner alongside other proposed major development areas and infill sites. The Phase 1 and Phase 2 Water Cycle Strategies establish the most effective foul drainage and water supply strategy for all development in the Cambridge catchment and the recommendations contained within these studies have been incorporated into the development proposals.

The Water Cycle Strategies also identify requirements for improvements to strategic wastewater infrastructure and thereby provide a mechanism for Anglian Water to seek investment to facilitate these improvements through its regulatory periodic review process for implementation in AMP5 (2010-15) and AMP6 (2015-20) and thereby ensure that the increased discharge from strategic development sites will not cause water quality within the River Cam to deteriorate.

The cumulative effect of the Proposed Development and other strategic sites on existing services will therefore be negligible as other developments will be brought forward in line with improvements to utility infrastructure.

Sustainability Considerations

The North West Cambridge Area Action Plan contains a range of policy drivers relating to sustainability. In addition, current and proposed national and local policy is improving sustainability standards, which the Proposed Development will have to meet. The Applicant has aspirations for meeting these high sustainability standards, and developing an 'exemplar' sustainable development which demonstrates how a development can be viably designed and constructed meeting these high standards.

The Proposed Development is being designed to meet a variety of sustainability standards. These include:

- Achieving Code for Sustainable Homes level 5 for all homes (with the exception of the first 50 homes if built before 2013).
- Achieving BREEAM Excellent for non-domestic buildings which fall within the BREEAM scheme.
- Developing low carbon and renewable energy infrastructure including a gas-fired CHP and district heating scheme, and the inclusion of other renewable energy technologies to achieve a 20% reduction in CO2 emissions from renewable energy across non-domestic buildings.
- Development of high efficiency buildings with consideration of orientation to reduce overheating.
- Healthy buildings which make use of natural ventilation where practicable and have good levels of natural daylighting. Narrow plan non-domestic buildings will be developed to meet these design principles, and single aspect North-facing dwellings will be minimised.
- Low water consumption, targeting 80 litres per person per day for dwellings. This will be achieved using a combination of efficient water fittings, and rain-water and grey-water recycling systems. Planting designed to have low irrigation requirements.
- Provision of allotments, and other food production areas to encourage local sustainable food production.
- Targets for construction waste to increase recycling and reduce waste to landfill.
- Provision of separate recyclables waste storage and collection in dwellings and streets.
- Provision of composting facilities in gardens and a central in-vessel composing unit for waste from public areas.
- Extensive pedestrian and cycle facilities and routes to reduce reliance on cars.
- A Site-Wide Travel Plan the primary aims of which are is to achieve a modal share of no more than 40% of trips to work by car (excluding car passengers) and to increase walking, cycling and public transport use.
- Provision of high quality public transport services with links to local and Cambridge city centre destinations.
- On-site leisure and recreation areas.

Approach

The Sustainability assessment within the ES assesses two important aspects of sustainability which are not addressed elsewhere, namely energy and CO2 emissions, and waste. In order to assess the likely significant environmental effects of the Proposed Development, three scenarios have been considered: two baseline scenarios and one incorporating the Proposed Development. The Proposed Development has been compared with each of the baseline scenarios.

- Baseline Scenario 1 assumes no further development on the Application Site and continuation of existing uses.
- Baseline Scenario 2 ("Do Minimum") assumes development on the Application Site of the scale of the Proposed Development but in accordance with Part L 2006 Building Regulations for domestic development and related measured benchmarks for non-domestic development rather than the most up to date standards which will apply when development commences. This is the baseline for the purpose of analysing the notional reductions in energy use required to be delivered under policy NW24 of the NWC AAP.
- The third ("with development") scenario assumes that the Proposed Development is carried out in accordance with the Development Parameters and in accordance with the Carbon Reduction Strategy outlined above.

Assessment

Energy and CO2 emissions

As a result of energy efficiency, the carbon reduction strategy predicts there to be a 29% reduction in heating fuel demand and a 12% reduction in electricity demand by comparison with Baseline Scenario 2. The combination of these provides an 18% reduction in total CO2 emissions. After the application of low and zero carbon energy technologies, the on-site reduction in CO2 is predicted to be approximately 48% for the development parameters over the 13 year lifecycle.

With the inclusion of carbon offsetting through allowable solutions, required to meet the future Building Regulations Part L, the total effective CO2 reduction is likely to be much higher than 47%. Allowable Solutions are a proposed Local Authority scheme whereby CO2 emissions not able to be managed on-site will be offset through financial investment in off-site carbon reduction schemes. Allowable Solutions are still in development however and until further information is provided by Government on how a scheme may operate, it is not possible to quantify these savings.

The effect of energy consumption and CO2 production at the Proposed Development as assessed by comparing the "with development" scenario with Baseline Scenario 1 is therefore theoretically major adverse at a local level. However in practice, this analogy is not apt since it does not reflect that in this scenario, other development to meet the Applicant's acknowledged need would be likely in the Cambridge Sub-Region in any event. Moreover at a national level, considered to be the minimum zone of influence, the effect would be **negligible**.

If the effect of energy consumption and CO2 production at the Proposed Development is assessed by comparing the " with development" scenario with Baseline Scenario 2 the result would be **minor beneficial** at a local level and at a national level **negligible**.

The effect of energy consumption and CO2 emissions on the zone of influence, at a national scale is considered **negligible** due to a negligible change and a negligible sensitivity.

Energy consumption and CO2 emissions from construction activities will be incurred for the development of a baseline development at the Application Site or elsewhere. These include energy associated with the transportation of goods and services; energy used in the construction process, and embodied energy in construction materials. In general, this energy consumption and associated emissions is small compared with the lifecycle emissions of the buildings.

By comparison with Baseline Scenario 1, the construction effects on energy consumption and CO2 emissions might be termed a major Adverse effect at a local level but negligible if one assumes that the development and therefore construction would take place elsewhere within the Cambridge Sub-Region in any event and Negligible within a national context. The local environment and national environment is deemed to have negligible sensitivity to this change in isolation, resulting in a **negligible** effect.

The cumulative effect of CO2 emissions and energy consumption needs to be considered at both a national scale, and also a local scale. As with the Development Proposals the need for the other sites to be developed in the Cambridge sub-region has been demonstrated and, therefore development would take place elsewhere within the Cambridge Sub-Region in any event .

Other sites to be developed in the vicinity of the Proposed Development include those set out in the table below with the expected Code for Sustainable Homes ratings targeted by the developments.

As Table 4 shows all other development sites in the vicinity of North West Cambridge are expected to meet or exceed the national trajectory for carbon reductions from new homes. With the exception of Northstowe the scale of CO2 emissions and energy consumption for the other sites individually can be expected to be lower than the Application Site during the assessment period given the lower scales of development assumed. In any case given that the zone of influence is national (UK CO2 emissions in 2009 were 481,000 ktonnes) or more, taken together the effects from the Proposed Development and the other permitted schemes will result in a Negligible change in UK emissions.

Whilst the development of the Application Site and the other development sites in the sub-region will have a **negligible** effect both in isolation and cumulatively, the need to mitigate energy consumption and CO2 emissions is required from all sectors if the UK Governments target of 80% reduction from 1990 levels by 2050 is to be achieved.

Climate Change

It is not possible to state exactly the effect that climate change will have on the Application Site. However likely consequences are as follows:

- An increase in peak summer temperatures
- Reduction in annual rainfall
- Increased likelihood of adverse weather conditions.

The resulting effects of these changes to the climate could be long term effects on the ecology of the Application Site, and changes in ground conditions with less rainfall. Climate change will also have consequences for humans including the provision of water, maintaining healthy internal environments in buildings, and designing structures to withstand more adverse weather conditions.

Waste

In respect of waste the Application Site is currently mainly agricultural use and is considered to produce negligible waste. However were the Proposed Development not to take place, a baseline development meeting the needs identified for North West Cambridge would result in approximately 110,000m3 construction waste and approximately 5,500 tonnes per year operation waste, which represents a high magnitude of change. However the effect on the local environment and waste handling systems is in either event considered **negligible**.

A number of measures are proposed which aim to reduce waste generation, and encourage recycling and re-use and where practicable, most BREEAM and Code for Sustainable Homes credits will be targeted.

In relation to Cumulative effects the waste handling facilities at Donarbon have been granted planning permission to handle waste for all of the planned expansion sites in Cambridge and therefore the cumulative effects of waste from each of the planned development sites in the vicinity of North West Cambridge can be considered **negligible**.

Site	Code Targets
Orchard Park	No Code Standard
NIAB1 & 2	Code 3 all homes
Clay Farm	Code 3 private housing
Code 4 affordable housing	
Glebe Farm	Code 3 private housing
Code 4 affordable housing	
Trumpington Meadows	Code 4 affordable Housing
Northstowe	Code 6 all homes

Table 4: Expected code for Sustainable Homes ratings of Cumulative Developments

Cumulative and Interactive Effects

There are four types of cumulative and interactive effects which are described within the following sections namely:

- Cumulative Effects of the Proposed Development with other committed developments
- Cumulative Effects arising from the Construction of the Proposed Development following first Occupation
- Interactive Effects where a measure proposed to avoid significant adverse effects gives rise to an effect elsewhere
- Interactive Effects of Activities/Operations associated with the Proposed Development which affect more than one environmental medium and interactive effects where an effect on an environmental medium has an effect on another environmental medium.

In relation to Cumulative Effects of the Proposed Development with other committed developments a summary of the likely significant effects has been captured under the individual topic headings.

In relation to the cumulative effects of the Proposed Development following first occupation in 2014 again these have been assessed within the relevant topic chapters

In relation to interactive effects the EIA Regulations refer to the need to consider "interactions" relating to effects although there is no guidance as to how interactions between effects should be assessed, how significance is reported or to what extent interactive effects assessment should be undertaken. However, interactive effects between one topic area and another have been identified and considered in this ES, where relevant.

Conclusions

The EIA process demonstrates that there are no significant adverse environmental effects resulting from the Proposed Development and overriding environmental constraints or conflicts with planning policies which are of a magnitude such as to preclude the Proposed Development.

The Proposed Development has taken account of the likely significant environmental effects and where necessary, measures are integrated into the Proposed Development to ensure that the environment is suitably protected.

This comprehensive assessment identifies that in a number of respects the Proposed Development would be likely to give rise to significant beneficial effects.