

# NW Bicester

An application for the exemplar phase of the  
NW Bicester Eco Development proposals submitted by  
P3Eco (Bicester) Limited and the A2Dominion Group

---

## Environmental Statement Addendum, April 2011

---



P3Eco Ltd

a2dominion 



# CONTENTS

1	Introduction .....	1
1.1	Project Background .....	1
1.2	Purpose of this Addendum .....	2
1.3	Structure of this Addendum .....	2
2	Air Quality Modelling Validation.....	4
2.1	Diffusion Tube Monitoring.....	4
2.2	Model Verification .....	6
2.3	Operation - Road Vehicle Exhaust Emission Assessment.....	8
2.4	Summary .....	10
3	Assessment of Design Changes .....	12
3.1	Description of Design Changes .....	12
3.2	Landscape and Visual Impact.....	15
3.3	Ecology.....	17
3.4	Flood Risk and Hydrology.....	24
3.5	Air Quality .....	27
3.6	Noise .....	27
3.7	Built Heritage and Archaeology .....	28
3.8	Contaminated Land .....	28
3.9	Agriculture and Land Use .....	28
3.10	Human Health.....	29
3.11	Socio-Economics and Community.....	29
3.12	Waste .....	29
3.13	Transport.....	30
3.14	Interrelationships and Cumulative Effects.....	30

## List of Revised Environmental Statement Drawings

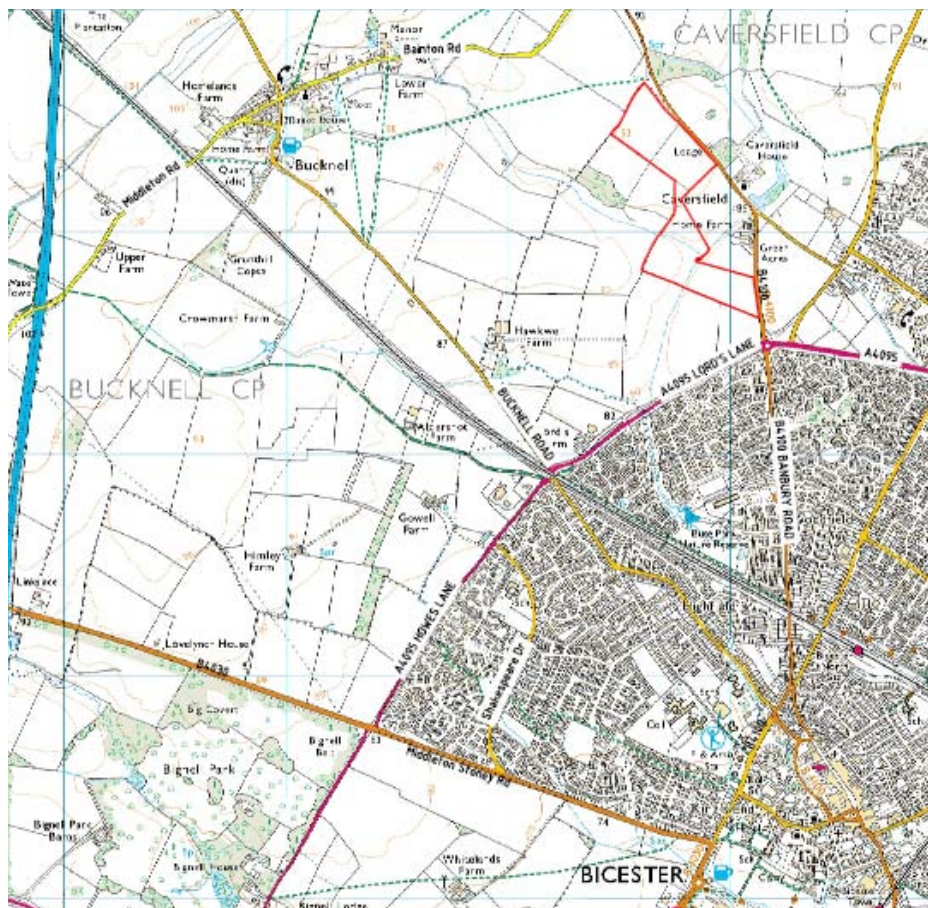
3-1	Exemplar Layout (Revised)
3-2	Landscape Framework Plan (Revised)
3-3	Exemplar Site Drainage Strategy (Revised)
6-8 – 6-17	Revised Viewpoint Photomontages

# 1 Introduction

## 1.1 Project Background

In July 2009, the Department for Communities and Local Government published 'Planning Policy Statement (PPS): eco-towns' as a supplement to PPS1 Delivering Sustainable Development. The PPS1 supplement includes requirements on sustainability, affordable housing, low and zero carbon technologies and public transport. Within the PPS1 supplement, eco-towns are defined as sustainable developments of at least 5,000 homes.

Four 'first wave' locations were identified with the potential to have an Eco-town; one of which was on land to the north-west of Bicester in Cherwell District. The North-West Bicester (NW Bicester) Eco Development lies to the north-west of Bicester, approximately 1.5km from the town centre, and comprises an area of approximately 416 hectares. The Eco Development is intended to provide a new form of sustainable community within Cherwell District, and to extend the benefits of this community to the existing town of Bicester.



**Figure 1-1 : Exemplar Development Location (Site boundary shown in RED)**

In November 2010, a planning application was submitted by P3 Eco (Bicester) Ltd and A2dominion Group for the Exemplar Development, the red line planning boundary of which is shown on Figure 1-1 above. The Exemplar Development is being brought forward as the first element of the project, and is expected to be constructed in phases between 2011 and 2026. The Exemplar Development is proposed for the north-eastern edge of the Eco Development area, covering 21.1 hectares.

The Exemplar Development will create a sustainable community, in accordance with PPS1: eco-town principles. The development proposals include provision for 394 residential units, an

energy centre, a primary school and a nursery school. There will be an Eco Business Centre, as well as office accommodation, retail units and social and community facilities. All these will be supported by associated means of access. Service infrastructure, lighting and car parking will also be installed. As well as the buildings, the development will incorporate amenity space and landscaping.

The Exemplar Development planning application was submitted as a hybrid application comprising:

- Full planning permission will be sought for the residential development, energy centre, means of access thereto, and associated car parking, landscape, amenity space and service infrastructure.
- Outline application for all non-residential uses, with consent being sought for access to those blocks.

The planning application for the Exemplar Development was accompanied by an Environmental Statement and Non Technical Summary, which was published in accordance with the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (Circular 02/99), which implement EC Directive 85/337/EEC and subsequent amendments. The Environmental Statement presented in detail the findings of the Environmental Impact Assessment for the Exemplar Development.

## 1.2 Purpose of this Addendum

The purpose of this Addendum is to provide supplementary information to the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01) that was submitted with the November 2010 Planning Application. Supplementary information is provided for two reasons:

- a** Full air quality monitoring results were not available at the time of the November 2010 Environmental Statement. These results are now available and can therefore be used to validate the model that the assessment of air quality effects was based on.
- b** A number of design changes have arisen as a result of consultation on the November 2010 Planning Application, and the environmental effects of these need to be considered. It is necessary to review whether the design changes result in consequent changes in the environmental effects that were identified in the November 2010 Environmental Statement. This Addendum details the findings of this review.

## 1.3 Structure of this Addendum

This ES Addendum should be read alongside the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01). The Addendum is structured as follows:

- Chapter 1 (this chapter) explains the background and purpose of the Addendum
- Chapter 2 details the air quality model validation work and findings
- Chapter 3 details the design changes that have arisen, and for each topic from the November 2010 Exemplar Site Environmental Statement it describes whether there are any consequent changes in the environmental effects identified in the November 2010 Environmental Statement.

Updated drawings are provided in this Addendum where there have been fundamental changes, such as the scheme description drawings and photomontages. The updated drawings retain the original numbering from the November 2010 Exemplar Site Environmental Statement. Drawings showing environmental baseline conditions and constraints have not been updated as

## 2 Air Quality Modelling Validation

In order to establish baseline air quality conditions in the vicinity of the proposed development, a six month nitrogen dioxide (NO<sub>2</sub>) diffusion tube survey has been undertaken in agreement with the Environmental Protection Officer (EPO) at Cherwell District Council. The monitoring locations are indicated on Drawing 9-2 of the November 2010 Environmental Statement. The survey has been undertaken to establish existing concentrations in the area and to provide a suitable dataset for verification of the assessment undertaken in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 HA 207/07 methodology included within the Environmental Statement for operational phase road vehicle exhaust emissions.

At the time of the planning application submission in November 2010 only two months of monitoring data had been collected. As such it was proposed to produce an Environmental Statement Addendum following completion of the survey to detail the full monitoring results and provide verification of assessment predictions. This is detailed in the following sections.

### 2.1 Diffusion Tube Monitoring

Passive monitoring of NO<sub>2</sub> concentrations has been undertaken at 15 locations in the vicinity of the proposed development as indicated on Drawing 9-2 of the November 2010 Environmental Statement. The survey has been undertaken over six months between August 2010 and January 2011 and consisted of monthly exposure periods. Monitoring locations were chosen in accordance with the methodology provided in 'Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance' produced by AEA Technology on behalf of the Department for Environment, Food and Rural Affairs (DEFRA). Raw monthly monitoring results are shown in Table 2-1.

**Table 2-1 Nitrogen Dioxide Diffusion Tube Monthly Data and Period Mean**

Location*	Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )						
	August 2010	Sept 2010	Oct 2010	Nov 2010	Dec 2010	Jan 2011	Period Mean
B1	15.7	-	27.6	29.0	-	-	24.1
B2	16.1	21.8	26.6	30.7	30.8	35.1	26.9
B3	-	20.5	24.8	30.8	27.9	30.3	26.9
B4	18.5	24.0	29.1	35.3	38.1	31.1	29.4
B5	19.9	23.7	30.6	29.7	39.2	36.2	29.9
B6	22.5	29.2	30.5	36.4	32.5	35.8	31.2
B7	18.1	19.7	23.4	29.8	32.6	29.1	25.5
B8	-	16.9	23.9	23.1	39.5	26.1	25.9
B9	27.0	30.6	35.3	-	-	36.4	32.3
B10	36.1	37.0	48.9	37.9	49.7	58.9	44.8
B11	23.4	32.8	35.9	38.3	41.6	38.4	35.1
B12	-	-	-	-	36.6	51.4	44.0
B13	23.6	27.2	36.3	40.4	35.5	37.0	33.3
B14	21.3	29.3	33.9	35.2	39.0	39.6	33.1



Location*	Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )						
	August 2010	Sept 2010	Oct 2010	Nov 2010	Dec 2010	Jan 2011	Period Mean
B15	17.8	22.7	27.8	35.3	38.2	33.5	29.2

Note: Data gaps marked with '-' are due to missing diffusion tubes.

\* See Drawing 9-2 of the November 2010 Environmental Statement

Due to the inherent bias associated with passive NO<sub>2</sub> diffusion tubes it is necessary to utilise an adjustment factor which can be applied to the monitoring dataset in order to calculate a true ambient concentration. A factor of 0.91 was obtained from the National Diffusion Tube Bias Adjustment spreadsheet (version 3/11) available from DEFRA for the analytical laboratory used for the study, Staffordshire Scientific Services, and used for the bias adjustment of the raw monitoring data.

In addition to bias adjustment, the NO<sub>2</sub> concentrations presented in Table 2-1 are in essence a period mean. However, period means are not directly comparable with annual mean Air Quality Limit Values (AQLVs) and therefore all monitoring results have been adjusted based upon the methodology contained within Local Air Quality Management Guidance LAQM.TG(09). The approach is based on the principle that patterns in pollutant concentrations are usually consistent across broad regions and therefore considers the relationship between period means and annual means at monitoring stations in the same region as the site of interest.

Table 2-2 presents 'urban background' monitoring locations within the vicinity of the site and the relationship between period and annual mean NO<sub>2</sub> concentrations. Urban background monitoring sites are characterised as urban locations distanced from sources and broadly representative of city-wide background concentrations. Data from these sites is considered by Local Air Quality Management Guidance LAQM.TG(09) to be suitable for the adjustment of short-term diffusion tube monitoring survey results to annual mean concentrations.

**Table 2-2 Period to Annual Mean NO<sub>2</sub> Concentration Factors**

Monitoring Site	NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )		
	2010 Annual Mean	Period Mean	Ratio Annual: Period
Oxford St Ebbes	22.3	23.8	0.94
Reading New Town	25.0	30.5	0.82
Northampton	20.6	24.0	0.86
Leamington Spa	28.4	30.0	0.95
<b>Mean Value</b>			0.89

Applying the calculated factor of 0.89 to the bias adjusted monitoring results provides an estimation of the 2010 annual mean NO<sub>2</sub> concentration, as shown in Table 2-3.

**Table 2-3 Adjusted Period to Annual Mean NO<sub>2</sub> Concentrations**

Location*	NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )		
	Period Mean	Bias Adjusted Period Mean	2010 Annual Mean
B1	24.1	21.9	19.5
B2	26.9	24.4	21.8
B3	26.9	24.4	21.8
B4	29.4	26.7	23.8
B5	29.9	27.2	24.2
B6	31.2	28.3	25.2
B7	25.5	23.2	20.6
B8	25.9	23.6	21.0
B9	32.3	29.4	26.2
B10	44.8	40.7	36.3
B11	35.1	31.9	28.4
B12	44.0	40.0	35.6
B13	33.3	30.3	27.0
B14	33.1	30.1	26.8
B15	29.2	26.6	23.7

\* See Drawing 9-2 of the November 2010 Environmental Statement

As indicated in Table 2-3, the annual mean NO<sub>2</sub> concentration at all diffusion tube monitoring locations was below the relevant AQLV of 40µg/m<sup>3</sup>.

## 2.2 Model Verification

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Overall model limitations; and,
- Uncertainties associated with monitoring data, including locations.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

For the purpose of this assessment model verification was undertaken for 2010, using traffic and monitoring results from this year.

The DMRB model was run with the traffic input data previously detailed for 2010 within the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01, section 9.3.2) to predict total oxides of nitrogen (NO<sub>x</sub>) concentrations at the diffusion tube

monitoring locations in the vicinity of the local road network. It should be noted that monitoring sites that were distant from the kerbside, or where traffic data was not available for the closest road links, were not included in the verification process.

The road traffic exhaust contribution to monitored NO<sub>x</sub> concentrations at each selected location was calculated from the monitored NO<sub>2</sub> concentrations for use in the verification calculation following the methodology contained within Local Air Quality Management Guidance LAQM.TG(09). The results of this process, in addition to the predicted road NO<sub>x</sub> contribution predicted from the DMRB model, are shown in Table 2-4.

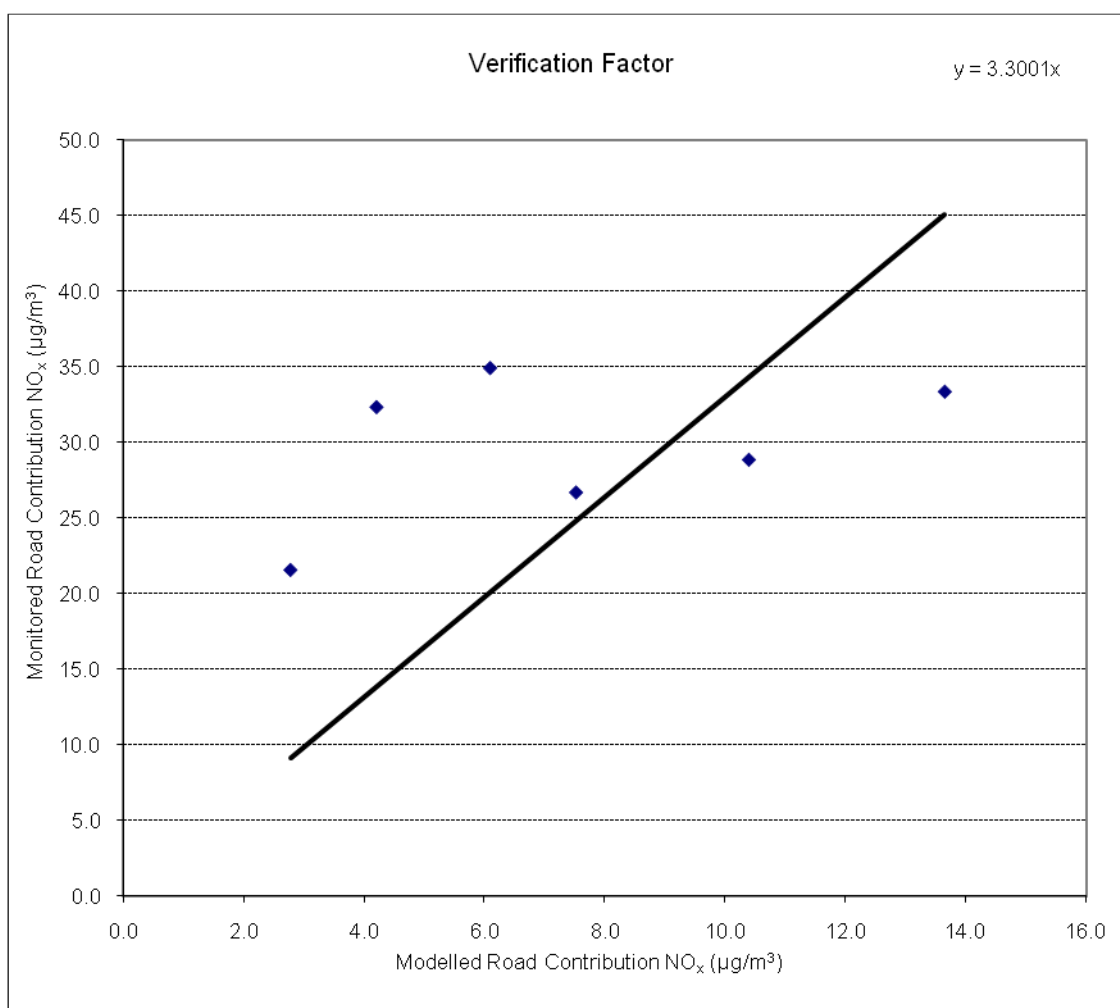
**Table 2-4 Monitored NO<sub>2</sub> and NO<sub>x</sub> Concentrations and Modelled NO<sub>x</sub> Concentrations**

Location*	Concentration (µg/m <sup>3</sup> )		
	Monitored Annual Mean NO <sub>2</sub>	Monitored Road Contribution NO <sub>x</sub>	Modelled Road Contribution NO <sub>x</sub>
B4	23.8	28.9	10.4
B6	25.2	33.4	13.7
B7	20.6	21.6	2.8
B13	27.0	34.9	6.1
B14	26.8	32.3	4.2
B15	23.7	26.7	7.5

\* See Drawing 9-2 of the November 2010 Environmental Statement

The monitored and modelled NO<sub>x</sub> road contribution concentrations were graphed and the equation of the trendline based on linear progression through zero calculated. This indicated that a verification factor of 3.3001 was required to be applied to all modelling results, as shown in Figure 2-1.





**Figure 2-1 DMRB Calculation Verification Factor**

## 2.3 Operation - Road Vehicle Exhaust Emission Assessment

Operational phase traffic emissions, including the cumulative developments detailed within the November 2010 Exemplar Site Environmental Statement, have been assessed using the DMRB calculation spreadsheet and verified using the factor detailed in Figure 2-1. Reference should be made to the November 2010 Exemplar Site Environmental Statement Chapter 9 for details of the data inputs used, assessment methodology and significance criteria.

Predicted annual mean NO<sub>2</sub> concentrations and associated impact magnitude are shown in Table 2-5.

**Table 2-5 Predicted Annual Mean NO<sub>2</sub> Concentrations with and without Development and Associated Impact Magnitude**

Receptor Number*	Predicted Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )		Impact Magnitude
	Without Development	With Development	
R1	12.3	12.3	Imperceptible

Receptor Number*	Predicted Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )		Impact Magnitude
	Without Development	With Development	
R2	14.5	14.5	Imperceptible
R3	16.3	17.5	Small
R4	17.8	19.2	Small
R5	18.3	19.5	Small
R6	19.1	20.5	Small
R7	16.8	17.3	Small
R8	16.0	16.5	Small
R9	19.1	20.0	Small
R10	20.0	20.9	Small
R11	26.9	29.6	Medium
R12	26.0	28.6	Medium
R13	22.2	24.3	Medium
R14	19.4	21.2	Small
R15	23.3	25.4	Medium
R16	29.4	29.4	Imperceptible
R17	30.1	30.2	Imperceptible
R18	11.9	11.9	Imperceptible

\* See Drawing 9-2 of the November 2010 Environmental Statement

As indicated in Table 2-5, predicted NO<sub>2</sub> concentrations are below the annual mean AQLV of 40µg/m<sup>3</sup> at all sensitive receptor locations both with and without the development. The predicted impact magnitude ranges from **imperceptible** to **medium**. Based on the magnitude of change, concentrations with the development and the significance criteria outlined in the Environmental Statement, impacts on annual mean NO<sub>2</sub> concentrations as a result of operational road traffic exhaust emissions are predicted to be **neutral** at receptors R1, R2, R16, R17 and R18 and **negligible** at all other receptor locations.

Predicted annual mean PM<sub>10</sub> concentrations and associated impact magnitude are shown in Table 2-6.

**Table 2-6 Predicted Annual Mean PM<sub>10</sub> Concentrations with and without Development and Associated Impact Magnitude**

Receptor Number*	Predicted Annual Mean PM <sub>10</sub> Concentration (µg/m <sup>3</sup> )		Impact Magnitude
	Without Development	With Development	
R1	16.2	16.2	Imperceptible
R2	16.5	16.5	Imperceptible

Receptor Number*	Predicted Annual Mean PM <sub>10</sub> Concentration (µg/m <sup>3</sup> )		Impact Magnitude
	Without Development	With Development	
R3	16.4	16.6	Imperceptible
R4	16.4	16.7	Imperceptible
R5	17.3	17.5	Imperceptible
R6	17.4	17.6	Imperceptible
R7	16.3	16.4	Imperceptible
R8	16.2	16.3	Imperceptible
R9	16.9	17.1	Imperceptible
R10	17.1	17.3	Imperceptible
R11	18.2	18.7	Small
R12	18.1	18.6	Small
R13	17.4	17.8	Imperceptible
R14	17.0	17.3	Imperceptible
R15	17.2	17.6	Imperceptible
R16	18.3	18.3	Imperceptible
R17	16.2	16.2	Imperceptible
R18	16.5	16.5	Imperceptible

\* See Drawing 9-2 of the November 2010 Environmental Statement

As indicated in Table 2-6, predicted PM<sub>10</sub> concentrations are below the annual mean AQLV of 40µg/m<sup>3</sup> at all sensitive receptor locations both with and without the development. The predicted impact magnitude ranges from **imperceptible** to **small**. Based on the magnitude of change, concentrations with the development and the significance criteria outlined in the Environmental Statement, impacts on annual mean PM<sub>10</sub> concentrations as a result of operational road traffic exhaust emissions are predicted to be **neutral** at receptors R1 to R10 and R13 to R18 and **negligible** at receptors R11 and R12.

## 2.4 Summary

This Addendum to the air quality chapter of the Exemplar Environmental Statement has been produced in order to detail the site specific NO<sub>2</sub> diffusion tube monitoring survey undertaken to define baseline conditions in the vicinity of the development, verify predicted concentrations included within the Environmental Statement and re-assess potential impacts as a result of operational phase road vehicle exhaust emissions.

The results of the NO<sub>2</sub> diffusion tube survey indicated that baseline concentrations in the vicinity of the site were generally low, with no monitored exceedences of the annual mean AQLV.

Results from the site specific monitoring have been utilised to verify the DMRB modelling results in accordance with the methodology outlined within Local Air Quality Management guidance LAQM.TG(09). The verification factor was subsequently used to adjust pollutant concentrations predicted as a result of operational phase road vehicle exhaust emissions.

Following results verification, predicted annual mean NO<sub>2</sub> and PM<sub>10</sub> impacts were predicted to range between **neutral** and **negligible** at discrete receptor locations. Exceedences of the relevant AQLVs were not predicted at any assessment location.

## 3 Assessment of Design Changes

### 3.1 Description of Design Changes

#### Objectives of the Design Changes

Revisions to the Exemplar layout have been undertaken to achieve the following improvements:

A: Providing a stronger relationship between the landscape and housing development;

- creation of green spaces within the north fields housing area
- improved relation of the north fields layout to the natural topography and slopes
- increased use of swales for Sustainable Urban Drainage Systems (SUDs)
- creation of a more varied landscape edge to the perimeter landscape.

B: Ensuring that the Exemplar Development links positively to the future phases;

- creation of a stronger hierarchy of connecting routes between phases
- incorporating potential for green spaces to link between phases
- relocation of housing types to provide appropriate frontage to future links.

C: Increasing benefits of the river corridor landscape for biodiversity gains;

- housing development set further back from the stream to provide wider landscape corridor
- refined bridge height and width, optimising biodiversity with minimum visual intrusion
- contoured bridge approaches into the landscape, allowing connectivity and visual links
- relocation of Pub to the east of the bridge, reducing impact on the landscape corridor, providing improved natural surveillance of neighbourhood play and enabling shared facilities with other commercial uses.

D: Maximum use of solar gains through revisions to house orientation and layout;

- orientational of windows to be south east or west facing where possible, optimising passive solar gains
- south facing slopes to use a mix of linear and gable roofs.

E: Improving appearance of housing development on site frontage and perimeters;

- spacing and alignment of housing becoming more varied in addition to housing types and orientation also being changed.

F: Improving the efficiency of the housing layouts to reduce hard paved areas.

- North field plots redesigned to improve road hierarchy in addition to more green areas improving connectivity on desire lines between housing areas and village centre
- Increasing efficiency of rear court parking areas and garages to conceal the majority of cars
- Provision of limited on street parking creating a variety of choice and capability to reduce size of rear courts.

G: Creation of distinctive character areas within the housing development;

- clear spatial framework creating legible patterns of streets and spaces
- mixture of narrow streets with close frontages of terraces and wider green open spaces
- mixture of terrace and detached houses within the same areas
- housing types have been grouped to create harmonious elevations
- increasing number of specials to create visual focus and enhance corners and gables.

## General Layout

The updated exemplar layout is shown in revised Drawing 3-1. The revisions to the exemplar layout retain the same site area, housing numbers, mix, and designs as the original application and the broad distribution of houses within the three areas, north, central and south remain the same as previous layout. The non residential uses are also the same and the location in the south along a village high street with potential future connections to further phases remains the same. The parking provision overall has been reduced from the original application, with the larger dwellings having fewer on plot parking spaces and the smaller dwellings having the flexibility to have one unallocated parking space. The larger houses have therefore been provided with additional ground floor home working or storage space within the original attached garage space. The unattached garages in the parking courts have been increased in size and have all been provided with green roofs.

### North fields

In the November application the north fields housing layout was designed with a rectangular grid of plots and roads which followed the existing field boundaries which were aligned at approximately 45 degrees from north south. The north fields housing layout has been redesigned and the grid has been substituted with a looser framework which takes account of: the west east slope of the land, existing field boundaries and hedgerows and also provides an improved orientation for houses to optimise passive solar gains and roofs slopes to the south.

The revised north fields layout has enabled the foot and cycle paths to realigned to create the most direct connections between through the housing in the north fields directly towards the village centre rather than the previous grid pattern of connections which forced the walking route against natural desire lines.

The revised layout also provides additional large areas of green open space in the centre of the housing. Whereas the original application had two types of residential character: a perimeter hedgerows facing house type and a inner street house type, the new layout creates more distinctive character areas using wider open green spaces with frontage housing within the residential areas to break up the plots and repetition and to enable better orientation for residents. The size of the perimeter blocks has been increased which allows the creation of longer terraces of houses which provides a sense of enclosure fronting the spaces and a more flexible layout to create different areas of rear parking courtyards.

The green spaces are aligned with the contours across the slope in the land which enables the green areas to incorporate swales and significantly reduce the quantity of piped surface water drainage and create a more varied habitat and biodiversity.

The perimeter landscape between the housing and the hedgerows has been revised and the housing perimeter is no longer parallel to the hedgerows which creates a more varied width of buffer to assist the new habitat creation and amenity uses in the landscape.

The hierarchy of access is also revised from the original application so that within the housing area there is less repetition of similar street design and a more gradual hierarchy established from spine road to access lane to perimeter lanes and paths. The layout gradually opens a



sequence of views from the centre towards the perimeter the open landscape. The varied perimeter building line creates varied and glimpsed views of development fragmented within landscape screening. When viewed from surrounding countryside and roads the housing is set back further from the boundary and spaced further apart in key view locations near the Banbury Road and Home farm compared with the original application which was forced closer to the boundaries by the grid layout and had a more repetitive layout.

The connecting route between the north and central fields has been changed from the previous layout which had an all vehicle access road. The revised layout has connections between the north fields and the central area by footpath and cycle and vehicular access only for bus, taxi, emergency and refuse vehicles. This revised layout will significantly shorten the distance travelled to access the village centre, school and shop using alternative modes of transport to the private car.

The revised north fields layout also differs from the previous design by providing a spatial framework which has a potential to link the North fields through to the future development of two fields to the south. Both access and green open spaces are now designed to be extended south creating potential green corridors for biodiversity and connectivity for residential areas.

The bus route has been changed as a one way route picking up passengers in the north fields with the bus route travelling south to the village centre before returning to Banbury Rd. A temporary bus stop has been added in the village centre. An additional bus stop has been located on the Banbury road at the south entrance to allow people to use buses travelling further villages to drop off or pick up.

Parking areas within the north fields have been redesigned to include a mix of car courts, off street and on plot parking, allowing flexibility to mix tenures and house sizes whilst providing a range of street environments including home zones and green streets.

### **Central and southern fields**

The principles of the layout and number and mix of the residential units in the central and southern areas have been retained and the main change to the layout has been a revision of locations of a small number of houses to provide a wider landscape river corridor to benefit biodiversity and to introduce more variety in alignment and materials to reduce the repetition of similar houses on frontages facing Home Farm. The Pub has been relocated from within the housing areas to the east of bridge within the commercial to reduce impact on landscape corridor, provide improved natural surveillance of neighbourhood play, enable shared facilities with other commercial uses.

In the southern area the village centre on the proposed high street and the housing area either side have been retained as the original layout with potential pedestrian links to the future development in fields to the south. There have been revisions to the location of a few houses near the Banbury rd frontage to improve the frontage views and to vary the frontage the houses on the perimeter.

## **Ground levels and contours**

The proposed ground levels would continue to follow existing topography. There have been some minor changes in the proposed localised minor earthworks that would be undertaken include the creation of water features or ponds and mounding as part of the landscaping scheme and at bridge abutments.

## **Development Area**

The development area remains the same.

## Green Infrastructure

The strategic landscape shall be laid out in accordance with the principles set out on updated Drawing 3-2 (Landscape Framework Plan), as described in the Design and Access Statement.

## Surface Water Drainage

The fundamental principles for the surface water drainage remain the same although the arrangement has changed to suit the new development masterplan layout. As shown in the revised Drawing 3-3.

## Services

The approach to utilities, including water supply and foul water drainage is not significantly changed.

## Phasing of Development

The proposed development phasing remains the same

## 3.2 Landscape and Visual Impact

### 3.2.1 Key Design Changes

The layout and use of building materials have changed, and landscape design proposals have been amended as set out in Section 3.1.

### 3.2.2 Methodology

The landscape and visual impact assessment set out in Chapter 6 of the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01) has been reviewed against design changes, with alterations to the assessment of effects set out below. The method for assessment is as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

### 3.2.3 Updated Assessment of Effects

Landscape mitigation measures/principles and the assessment of landscape effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

Drawings 6.8 to 6.17 of the November 2010 Exemplar Site Environmental Statement provided viewpoint photomontages of the proposed development 1 year and 15 years after construction. These have been revised to reflect the updated design, and are provided in this Addendum, with corresponding visual impacts described below.

Viewpoint 1: View north-eastwards from field gate off A4095 Lords Lane: The layout of proposals has changed and the energy centre design has changed, however this would not be perceptible from Viewpoint 1; the assessment of effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

Viewpoint 2: View north-eastwards from junction of Germander Way and A4095 Lords Lane: The layout of proposals has changed, however this would not be perceptible from Viewpoint 2; the assessment of effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

Viewpoint 3: View north-westwards from B4100 Banbury Road south of Home Farm/Caversfield: The layout of the proposals has changed and some stone building facades will now be visible, with additional individual tree planting, however built form will continue to appear in keeping with the local context and set behind hedgerows/trees. As a result the assessment of effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

Viewpoint 4: View westwards from residential properties south of Caversfield: The assessment of effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

Viewpoint 5: Views north-westwards from B4100 Banbury Road at Caversfield: The layout of the proposals has changed and some brick building facades will now be visible, with additional individual tree planting, however built form will continue to appear in keeping with the local context and set behind hedgerows/trees. As a result the assessment of effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

Viewpoints 6 and 7: Views south-westwards and north-westwards at entrance to Home Farm Business Units: The layout of the proposals has changed and some brick building facades will now be visible, with additional individual tree planting, however built form will continue to appear in keeping with the local context and set behind hedgerows/trees. As a result the assessment of effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

Viewpoints 8 and 9: Views southwards from Public Footpath northwest of Caversfield: The layout of the proposals has changed and some brick building facades will now be visible, with additional individual tree planting, however built form will continue to appear in keeping with the local context and set behind hedgerows/trees. As a result the assessment of effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

Viewpoint 10: View southwards from junction of B4100 Banbury Road near Bainton Road: The layout of the proposals has changed and some brick building facades will now be visible, with additional individual tree planting, however built form will continue to appear in keeping with the local context and set behind hedgerows/trees. As a result the assessment of effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

Railway: The assessment of effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

The overall significance of visual effects, taking into account the range of individual visual effects, is considered to be **slight adverse**, as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

### 3.2.4 Summary of Changes

The assessment of landscape effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01). Viewpoint photomontages of the development have changed slightly, however the assessment of visual effects remains as set out in the November 2010 Exemplar Site Environmental Statement (Ref 0505-UA001881-UP31R-01).

## 3.3 Ecology

### 3.3.1 Key Design Changes

The revisions to the layout that have had an effect on the future value of the site for biodiversity are as follows:

- The buffer zones alongside the River Bure and its tributary have been widened so that the water channels are within a 60 metre-wide corridor of retained and enhanced semi-natural vegetation.
- The footpaths and cycle ways within the riparian corridors have been moved further away from the main water channels; these paths will not be lit to avoid disturbance to wildlife.
- The bridges across the watercourses have been redesigned. The culverts have been widened to 6 metres and design amended to include stone clad walls.
- The land adjacent to the bridging points on the watercourses will be remodelled to reduce the visual impact of these structures.
- The landscape plans have been refined to provide further detail with respect to the planting mixes chosen to create the semi-natural habitats on the site.
- The number and diversity of sustainable drainage features that will be created as part of the proposal have been increased to avoid the need for underground storage.
- Additional areas of green space will be created within the northern half of the development area, to provide space for new drainage features.
- The locations of some of the allotments have been moved; notwithstanding this the approach that was taken previously with respect to the Masterplan layout has been followed. Consequently, these features are located alongside hedgerows to provide a buffer between the hedgerows and the built development.

### 3.3.2 Methodology

In addition to the design changes identified above, surveys have been completed for brown hairstreak butterflies and wintering birds subsequent to the completion of the ES. Areas of suitable habitat (Blackthorn scrub and Blackthorn within hedgerows) within the entire NW Bicester) Eco Development site (including the Exemplar Site) were searched by experienced ecologists in February 2011 to confirm the presence/absence of brown hairstreak butterfly eggs. Due to the size of the site, the search focused on the areas of Blackthorn habitat that were most suitable (south facing hedgerows that were less heavily managed). In addition, Butterfly Conservation was consulted with respect to the likelihood that these butterflies and other Biodiversity Action Plan species would be present within the wider Eco development site including the Exemplar Development area. Butterfly Conservation also undertook targeted surveys for brown hairstreak butterflies in habitats adjacent to the Eco development site in March 2011 to update their records for known locations for this particular species.

Wintering bird surveys were undertaken between January and March 2011 for the wider Eco development site, the survey area included the Exemplar Development area. The site was visited each month (each visit took several days to complete in order to survey the site in sufficient detail). Birds were identified by sight and song and the location and number of individuals recorded.

The assessment of effects has been updated (below) to include the results of the further surveys and consultations. The assessment has also been updated to provide further information requested by consultees.

### 3.3.3 Updated Assessment of Effects

#### Ardley Quarry and Cutting Site of Special Scientific Interest

This SSSI is 1.6km from the Exemplar site. As noted in the ES it is not anticipated that development within the Exemplar site would have any direct or indirect effect on this SSSI. Previously the ecology chapter did not mention the results of the air quality modelling. This modelling showed that the energy centre would have no effect on air quality at this distance. In addition, the Highways Agency guidance indicates that it is necessary to model impacts on air quality on sensitive receptors up to a distance of 200m from a road. Given the distance from the Exemplar Site it is not considered that road traffic associated with the development would have any effect on the SSSI. It should also be noted that the modelling has shown that the traffic associated with the redevelopment would have a negligible impact on air quality at the nearest sensitive receptors

#### Conservation Target Areas (CTAs)

As noted in the ES there are two CTAs close to the Exemplar site; these are Tusmore and Shelswell Parks with Stoke Lyne Woodlands CTA and the River Ray CTA. It was not anticipated that the development proposal would have any adverse effects on the CTAs and thus they were scoped out of the detailed assessment. However, there is the potential that the development proposal could have a beneficial effect on these sites through the creation of habitats and landscape proposals in line with the aims and objectives of these CTAs. The measures that have been incorporated within the Masterplan that are in keeping with the Tusmore and Shelswell Parks with Stoke Lyne Woodlands CTA include: a) the creation of mixed deciduous woodland planting and b) the creation of orchards. The measures that are in keeping with the River Ray CTA are: a) the retention and improved management of the hedgerows and watercourses; b) the creation of new ponds; and c) the creation of flower-rich grasslands. The target for the latter CTA is MG4 grassland and plant species associated with this grassland type would be planted within, and close to, ephemeral ditches associated with the sustainable drainage system.

#### Local Wildlife Sites (LWS)

These are non-statutory designated sites that are considered to be of County importance for nature conservation. Those that are within one kilometre of the Exemplar site are located within either the Tusmore and Shelswell Parks with Stoke Lyne Woodlands CTA or form part of Stratton Audley Quarries SSSI. As identified in the ES it is not considered that the development proposal would have any effect on the CTA or SSSI and thus it is not anticipated that there would be any adverse effects on the LWS located within them.

#### Hedgerows

As identified in the ES the hedgerows within the site were species-rich and considered to be of 'District/Borough' Importance. Consequently, it was considered appropriate to retain these features within buffer zones that would be seeded with a diverse grassland species mix comprising native species. Fragmentation of these features has been kept to a minimum. Wherever it is necessary to breach these features the affected sections will be translocated to create new hedgerows linking the retained hedgerows. These buffers are a minimum of 3 metres wide and in most cases the buffer is far greater than this since other 'green' features have been located alongside them. This includes allotments, SuDS features, areas of open space and play areas. These features will be protected during the construction phase in

accordance with a Construction Environmental Management Plan and once the development is built these features would be managed to benefit wildlife and subject to less regular trimming in accordance with Landscape and Ecology Conservation Management Plan. Consequently, the proposal should have a beneficial effect on the species associated with these hedgerows in the longer-term.

Although there are fewer breaches in the hedgerows when compared to the previous Masterplan, there has been a reduction in the area identified in the Green Infrastructure calculation as 'hedgerows and buffers'. It is not considered that this will have any effect on the value of these features for wildlife, since as identified previously all hedgerows have a buffer that is at least 3 metres in width. This alteration in figures simply reflects the fact that other areas of green space such as SuDS features and allotments have moved into the areas of grassland habitat. This has been necessary in order to provide larger areas of green space within the development for the SuDS features and the stream corridors. As indicated below both the SuDS features and the stream corridors support habitats of value to wildlife and thus it is considered beneficial to wildlife to reallocate the green space in this manner.

## The River Bure and its tributary

Following discussion with consultees, the corridor of semi-natural vegetation that would be retained and enhanced to benefit these watercourses has been increased. As part of the redesign there will be a 60 metre-wide corridor of semi-natural vegetation associated with these features. Habitats of value to wildlife will be created and maintained within this corridor of vegetation, as follows:

- The main badger sett will be retained and shrub planting will be used where appropriate to deter interference with the sett.
- An orchard will be created within the river corridor to provide opportunities for gathering food for the local residents and also to provide a seasonal foraging resource for the badgers.
- Areas of species-rich grassland will be created within this area; this will provide nectar sources and basking opportunities for invertebrates, habitat for foraging badgers, maintain open and unshaded sections of the water channel to benefit instream fauna and benefit species associated with long-grass habitats. The grassland will be managed by cutting on an annual basis to ensure that plant species diversity is maintained. The grass cuttings will also provide habitat for wildlife as it is composted or forms habitat piles. Previously, the landscape proposals indicated that wet grassland would be created here, this was an error, given the steepness of the slopes and the free-draining nature of the soils the grassland will largely comprise species associated with dry conditions. The exception to this is the grassland in proximity to the SuDS features. Where these features have been designed to retain water, native wetland plants and/or grassland species associated with damp soils will be planted/sown.
- The existing trees and shrubs on the bank of the Bure will be retained and new native tree and shrub planting at the confluence of the two watercourses will add to the existing woodland vegetation. These new plantings will be managed to encourage strong well-balanced growth in the short-term. The longer-term aim will be to create dense woodland, with a more open glade.
- Water features associated with the SuDS will be located within the stream corridors; these features will be sufficiently distant that they will not flood on a regular basis. They will be created and maintained to provide habitat of value to wildlife.

Most of the stream banks will retain their current profile. However, where it is necessary to undertake earthworks to modify the contours close to the proposed bridge locations, and to create ephemeral pools associated with the SuDS system, care will be taken to protect the



badger sett and reduce the effects of tree loss. As outlined in the ES, standard pollution control measures will be implemented to ensure that water quality is protected. Such measures will form part of the CEMP. The bridge culverts have been widened to 6 metres as part of the redesign (previously they were 4 metres-wide). Thus, there will now be a small area of open bank either side of the water channel for most of the year. As previously, a mammal ledge will be provided to enable badgers and otters to pass under the bridge when water flows are high and bats and birds will be able to pass through the culvert. The wing walls will be clad in stone with niches and ledges provided to create features suitable for crevice dwelling bats, invertebrates and birds. The slopes adjacent to the bridges will be planted to provide habitats of value to wildlife as part of the landscaping proposals for the river corridor.

As indicated in Section 3.3.1 (above), as part of the redesign the cycle paths and footpaths have been moved further away from the water channels to further reduce any impact on the watercourses and their associated wildlife.

The implementation of mitigation measures outlined in the ES will ensure that there are no residual impacts arising from works undertaken during the construction phase. The creation of new habitats within the river corridors will have a beneficial effect on these watercourses and sensitive management of these habitats in accordance with a Landscape and Ecology Conservation Management Plan will ensure that their value to wildlife is maintained in the longer-term.

## Brown Hairstreak Butterflies and other BAP Butterflies

Surveys have revealed that brown hairstreak butterflies are present on the wider Eco development site and within areas of Blackthorn immediately adjacent to it (areas to the east). These surveys have revealed that most of the hedgerows on the Exemplar site are too regularly managed by cutting or browsed by cattle to support this species. The southern aspect of the hedgerow that forms the southern boundary to the eastern half of the Exemplar site was less regularly managed and thus, has the potential to support this species. Although no confirmatory signs of the presence of this species were recorded in this hedgerow it is nevertheless considered possible that these butterflies would be present. This hedgerow would be retained within the development layout and the southern aspect of this hedgerow is not within the Exemplar Development boundary. It is considered that brown hairstreak butterflies and other invertebrates associated with the hedgerows, including White-letter hairstreak butterflies and other BAP species, would be able to use the Blackthorn and Elm within the retained hedgerows once the development is completed. Semi-natural habitats that are of benefit to invertebrates, including BAP species, will be created as part of the landscaping proposals for the scheme. These include areas of diverse grassland comprising native species, native tree and shrub planting, orchards and wetland habitats associated with SuDS features. In addition, these newly created habitats and the retained hedgerows and watercourses will be managed in accordance with a Landscape and Ecology Conservation Management Plan which will ensure that they maintain their value for wildlife including invertebrates.

## Wintering Birds

The wintering bird surveys revealed that the Exemplar Development site supported small numbers of bird species associated with farmland habitat. This is in line with the results of the breeding bird survey reported previously in the ES. Thus, the site supports a bird population of 'Parish/Neighbourhood' nature conservation value. Species of conservation concern that have been recorded on site are listed in **Table 3-7** (below) with an indication of the numbers of individuals recorded on site during each visit.

**Table 3-7 Bird Species of Conservation Concern Recorded on the Exemplar Site during the Wintering Bird Surveys**

Bird species	Conservation status	January 2011	February 2011	March 2011
Bullfinch	Amber list	3		
Dunnock	Amber list			1
Fieldfare	Red list		150	
Herring gull	Red list	2	100	30
Redwing	Red list	1	30	1
Starling	Red list		10	
Yellowhammer	Red list	1		30

Of the bird species listed in **Table 3-7** (above) it is considered that bullfinch and dunnock would continue to forage within the hedgerows and scrub on the site. Fieldfare, redwing and yellowhammer are more sensitive to disturbance, and thus would be expected to forage within the hedgerows that are on the edge of the site that are located adjacent to retained farmland. The starling and herring gull are foraging within the open fields and therefore would be displaced to retained areas of farmland when the site is developed; that said they are likely to use the larger blocks of open grassland habitats such as the school playing fields.

## New areas of green space

To reduce reliance on underground storage tanks more features will be created as part of the sustainable drainage system. This had lead to the creation of two large areas of open space within the northern half of the development. These areas of green space will link to areas of open space in the wider Eco development site to the south. These drainage features will incorporate habitats of value to biodiversity similar to those that will be created elsewhere in the site. It is proposed to create a range of SuDS features including swales, ponds, dry basins and scrapes that support native plants. These features would be managed to create habitats of benefit to wildlife.

## Net Gain in Biodiversity

The landscape proposals include the creation of significant areas of semi-natural habitats as illustrated on the Landscape Framework Plan (Drawing 3-2). In addition, it is proposed to install boxes to provide artificial nest and roost sites for bats, birds and invertebrates. The green streets and 'home zones' form part of the design which will also provide habitats for wildlife. A change in ecological value has been calculated following BREEAM guidance and this has revealed that there will be a positive change in species value of 0.98 species hectares. See **Table 3-8 to Table 3-10** (below) for more details with respect to this calculation. It should be noted that the Masterplan has been revised since this calculation was carried out. The final Masterplan includes green and brown roofs which have not been included in the calculation, and the area identified as SuDS features is greater than indicated in this calculation. It is also likely that the habitats identified as domestic gardens, allotments and 'other areas of open space' which includes areas within the school grounds, would support more species than identified in Table 3-9. Consequently, the calculation provided below represents the minimum positive change in species value that would occur as a result of the development.

**Table 3-8 Species present on site prior to development**

<b>Habitat type</b>	<b>Area m<sup>2</sup></b>	<b>Number of species</b>	<b>species x area of plot type</b>
Grassland	90779	16	1452464
Arable land	94123	1	94123
Hedgerows	16933	27	457191
Plantation	4588	4	18352
River Bure	4823	8	38534
Total site area	211246		
Total species x area			2060714
<b>Species value before development</b>			<b>9.76</b>

**Table 3-9 Species present on site after development**

<b>Habitat type</b>	<b>area m<sup>2</sup></b>	<b>Number of species</b>	<b>species x area of plot type</b>
Existing hedgerows	15456	27	417312
River Bure not including the orchard etc	3814	8	30512
Biodiverse grassland	27043	25	676075
Amenity grassland/play area	9832	24	235968
SuDS planting	3042	38	115596
SuDS ponds	186	11	2046
Native woodland planting	5949	15	89235
New hedgerows	1097	14	15358
Trees	16667	7	116669
Orchard planting	700	3	2100
Translocated hedgerows	1477	27	39879
Allotments	5068	10	50680
Domestic gardens	19650	15	294750
LEAP trees	345	7	2415
LEAP grassland	1426	24	34224
Other areas of open space not included	9635	15	144525

elsewhere			
Built land	89859	0	0
Total site area	211246	27	
Total species x area			2267344
<b>Species value after development</b>			<b>10.73</b>

**Table 3-10 Change in species value**

<b>Species value before development</b>	<b>Species value after development</b>	<b>Change in species value</b>
9.76	10.73	0.98

## Biodiversity Strategy

The biodiversity strategy was submitted as an Appendix to the ES. The redesign of the Masterplan is in accordance with the biodiversity strategy, the main focus of which was to retain and create features of value to wildlife and identify the need for management and monitoring.

### 3.3.4 Summary of Changes

The redesign of the Masterplan has lead to the following amendments with respect to design in comparison with the previous scheme:

- The belts of semi-natural vegetation alongside the River Bure and its tributary have been widened to provide a 60 metre-wide corridor of green space that will buffer the watercourses and associated wildlife from development and provide corridors for the movement of wildlife. The error on the landscape plans associated with the identification of wet grassland habitat in this area has been rectified.
- Footpaths and cycleways have been moved further from the main water channels, reducing the effect of lighting and noise disturbance to wildlife.
- The bridge design has been altered to provide a wider culvert and the walls incorporate nesting and roosting sites for wildlife.
- Further details have been provided with respect to the planting proposals for the site.
- The SuDS proposals have been amended to include more above ground features. This has provided the opportunity to create more areas of habitat of value to wildlife comprising swales, ponds, dry basins and scrapes that support native plants.
- Further information has been provided in this document in support of the assessment of impacts outlined in the Ecology chapter of the ES.
- The BREEAM calculation that illustrates that there would be a net gain to biodiversity has been amended to reflect the changes to the Masterplan layout.

## 3.4 Flood Risk and Hydrology

### 3.4.1 Key Design Changes

The development is designed as an exemplar eco development and the changes to the masterplan since the previous ES submission have improved the built response to the water environment. There have been several changes to the masterplan since the last ES submission that altered the response of the development to the flood risk and hydrology elements. The development layout has been revised which has led to changes to the surface water drainage layout. There are also alterations to the river corridor that will change the landform, enhance the landscape and remove minor obstructions on the watercourse itself.

The fundamental principles for the surface water drainage remain the same although the arrangement has changed to suit the new development masterplan layout. SuDS techniques (as described in the Flood Risk Assessment) form the basis of the surface water drainage approach, therefore any impacts to surface water will be mitigated. All baseline, construction and operation elements remain unchanged.

The approach to water supply and foul water drainage is unchanged.

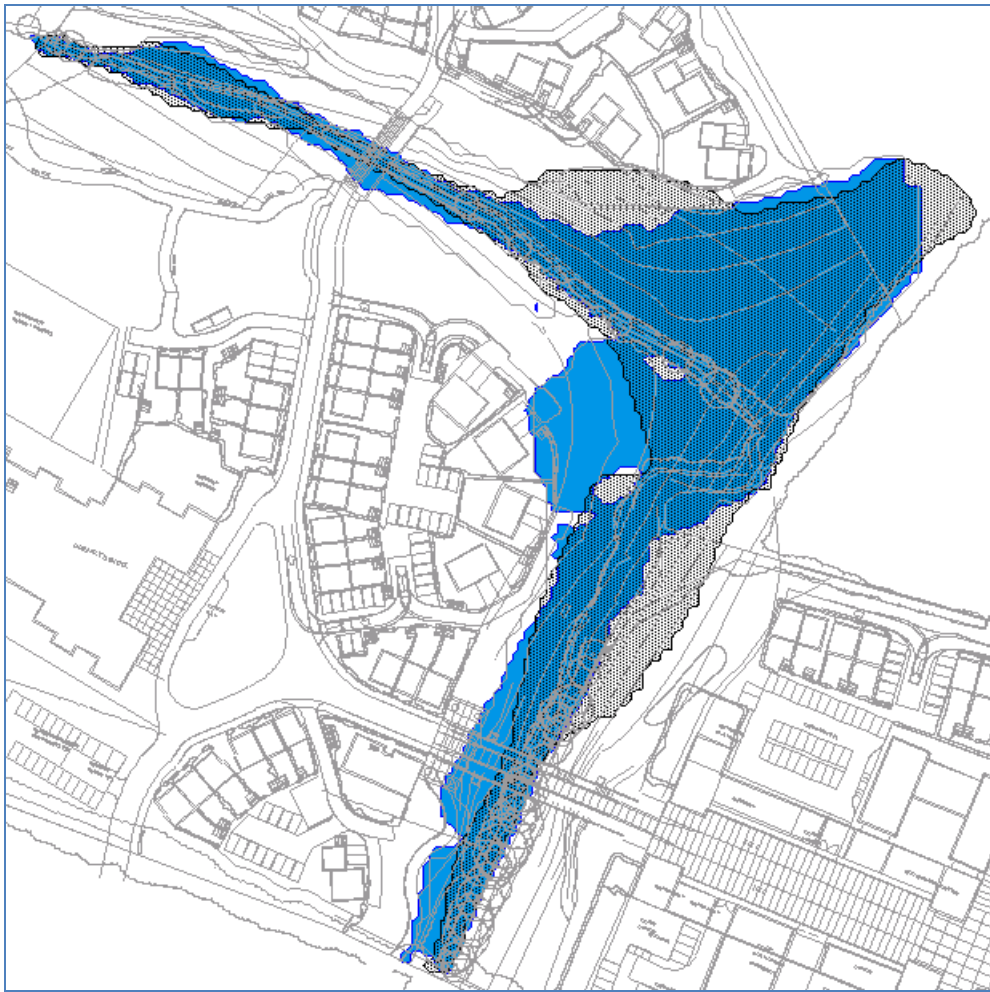
### 3.4.2 Methodology

Additional flood modelling has been undertaken to assess the post-development arrangement, looking particularly at the impact of the proposed bridges over the watercourses and the revised landform of the river corridor. Revised baseline flood extents have also been produced as a result of increasing the number of cross sections for better interpretation of flood levels at critical locations.

### 3.4.3 Updated Assessment of Effects

#### Flood Risk

Figure 3-2 shows the change in flood extent caused by the proposed development for the 1000-year flood event (i.e. Flood Zone 2), where the revised baseline is shown in blue and the post-development extent in black.



**Figure 3-2 Post-development extent comparison**

This shows that around the proposed bridge on the tributary, the contouring and bridge structure have little impact on the modelled flood extents. Downstream of this area, the re-contouring causes additional flooding on the open space on the left bank, but this does not threaten the proposed development. At the confluence with the River Bure, the re-contouring has significantly reduced the flood extent on the western side of the confluence, removing the area of flooding that impacts the gardens and roads from the revised development masterplan. Downstream of this area, the landscaping associated with the second bridge has decreased the flood extent at the bridge location downstream, but increased the flood extent upstream of the bridge on the left bank of the River Bure. This also does not threaten the proposed development.

A comparison of modelled flood levels through the development site has shown that modelled water levels through the reach are generally lower, with moderate increases of 50 mm to 110 mm immediately upstream of the downstream bridge. This indicates that this bridge in conjunction with the narrowing of the channel at this point is causing a slight obstruction to flow in this area.

A comparison of modelled velocities through the development reach has shown increases in velocities in the reaches around both proposed bridges.

Figure 3-3 shows the areas of increased velocity on the proposed development plan.





**Figure 3-3 Reaches showing increased velocity**

Some of the increases in velocity shown are potentially significant, with velocities at the downstream bridge increasing by approximately 40-60%. This has the potential to cause scour in the areas around the bridges, which may be a particular problem at the downstream bridge due to larger velocities and the presence of a narrow channel with steep banks. Scour protection such as willow spiling and coir plants will be incorporated in these areas as part of the landscape strategy.

The proposed development causes no significant change in flood extents, levels or velocities downstream of the development site.

The proposed adjustments to floodplain contours across the development site ensure that the development has been placed entirely within Flood Zone 1, as is required for an Eco-Town under PPS1. All proposed development has been located within the areas of Low risk, and therefore the development is considered to be at **low** risk of flooding from fluvial sources. Therefore the baseline, construction and operational effects assessment remains unchanged.

## Water Quality

As there is no change to the surface water management approach the water quality impacts and therefore the statement of effects remain unchanged.

## Water Supply

As there is no change to the water supply approach therefore the statement of effects remain unchanged.

## Foul Water

As there is no change to the water supply approach therefore the statement of effects remain unchanged.

### 3.4.4 Summary of Changes

Overall the impacts are considered to be unchanged from the original Exemplar Environmental Statement

## 3.5 Air Quality

The November 2010 Environmental Statement reported the potential for air quality impacts through construction and operational (traffic and energy generation) activities on the development. The assessment identified a slight adverse impact from construction dust during the construction phase for the development. No permanent residual impacts associated with traffic were reported, as the overall rating for the impact of traffic emissions was highlighted as being negligible.

Following results verification, presented within Chapter 2 of this Addendum, predicted annual mean NO<sub>2</sub> and PM<sub>10</sub> impacts were reported to range between neutral and negligible at discrete receptor locations. Exceedances of the relevant AQLVs were not predicted at any assessment location. Potential energy centre impacts remain as reported within the original ES; probable, long-term, local, continuous, and reversible in nature.

Whilst the internal layout of the Exemplar Development has been altered, the quantum of the development remains identical to the design assessed within the November 2010 ES. The impacts reported within Chapter 2 of this Addendum confirm that design alterations arising from consultation on the 2010 Planning Application result in no consequential changes in the significance of Air Quality impacts as identified within the November 2010 Environmental Statement.

## 3.6 Noise

The noise and vibration assessment presented within the November 2010 ES was carried out to identify and assess the suitability of the ambient noise and vibration levels across the proposed development for residential use and also assess the impact upon road traffic noise levels and the effects of construction noise at existing receptors within the local area.

Within the November 2010 ES, assumptions were made regarding the construction plant that would typically be used for developments such as the Exemplar site. The construction noise impacts are dependent on proximity of the construction works to receptors, the nature or intensity of the construction, the type of plant being used and the time of day. Construction noise impacts were reported as generally being of fairly short duration, with scope for suitably implementing mitigation. Changes to the design will not impact on construction traffic volumes or any of the assumptions included within the original assessment and therefore construction impacts remain as assessed within the ES.

Operational traffic noise impacts were shown to be negligible when assessed against the criteria in DMRB and the requirement for mitigation measures for road traffic noise was identified as not being necessary. Although the layout of roads within the development has been changed, noise levels of traffic during the development's operation will remain as assessed within the original ES. This assessment remains unchanged as a result of the proposed design changes. Operational noise will arise from fixed plant and similar installations to be constructed onsite.

The proposed design changes have no direct impact on predicted assessed noise from fixed installations and therefore impacts remain as assessed within the November 2010 ES.

Despite a number of design changes arising as a result of consultation on the November 2010 Planning Application, these alterations will have no effect on the noise impacts associated with the development as assessed within the November 2010 ES.

## 3.7 Built Heritage and Archaeology

The investigations carried out as part of the November 2010 assessment determined that there was little to no potential for archaeological remains to be present within the proposed Exemplar Site development. Additionally, the November 2010 ES identified the absence of buildings of historic value within the proposed Exemplar Development itself and concluded that the development will have no direct physical impacts upon any built heritage assets. The extent and location of the development following design changes remains unchanged from the initial assessment, with the line of the development's field boundaries being retained as per the November 2010 Exemplar Development design.

The retention of the originally proposed site boundary furnishes no change to the original historic landscape, built heritage or archaeological assessments presented within the November 2010 ES.

## 3.8 Contaminated Land

The November 2010 ES highlighted that in those areas of the site covered by the intrusive ground investigation, no contaminated soil or groundwater was discovered. In those unexplored areas of the site, it was considered that mitigation measures would significantly reduce or completely mitigate any potential impacts of contaminated land.

The contamination risks associated with the redesigned Exemplar site are considered to remain as presented within the November 2010 ES; very low, though the risks from naturally occurring radon gas require basic radon protection measures to be incorporated in the construction of new dwellings and extensions. No changes to construction or operational impacts are expected to arise as a result of the amended design development.

The site boundary of the amended Bicester Exemplar Development remains unchanged resulting in no requirement to undertake work in ground not previously assessed within the November 2010 ES. Furthermore, no additional ground break is required as a result of the newly proposed design changes to the Exemplar Development and therefore the impacts associated with contaminated land remain as reported within the November 2010 ES.

## 3.9 Agriculture and Land Use

The site boundary of the development remains as assessed within the November 2010 ES, the minimal area (approx 1ha) of 'Best and Most Versatile' (BMV) land affected remains unchanged. Therefore the impact of the proposals remains of no more than a Slight Adverse impact on agricultural land. The proposal to include areas for local food production, and provide advisory support for residents in relation to soil management, will further mitigate the loss of this land as identified within the November 2010 ES.

The key potential impact identified remains as assessed within the November 2010 assessment; increased disturbance to livestock once the development homes become occupied.

Despite a number of design changes arising as a result of consultation on the November 2010 Planning Application, these alterations will have no effect on the Agriculture and Land Use Impacts associated with the development as assessed within the November 2010 ES.

### 3.10 Human Health

The November 2010 ES assessed the potential effects on human health of the construction and operational phases of the proposed Exemplar Development. A number of mitigation measures were incorporated into the design process to maximise potential health benefits and to minimise the likelihood of adverse health effects occurring.

During the construction phase, health effects were assessed as positive with regard to the potential employment opportunities that will be created and the wider upskilling benefits that may be delivered. The impacts on the following health determinants were assessed as having a neutral effect on health outcomes: safety and security, air quality, noise and vibration, physical environment and urban design, healthy lifestyles, transport and access, waste management and contamination, community and social infrastructure and access to and provision of health facilities and services. The newly proposed development design results in these impacts remaining as assessed within the November 2010 ES.

During operation, the proposed Exemplar Development will generate a number of jobs and could potentially attract a significant amount of new investment within the immediate area as assessed within the November 2010 ES. The commitment within the design to creating a site where walking and cycling are encouraged is retained within the amended design highlighting that the design changes have no effect on the Human Health impacts as identified within the original ES.

### 3.11 Socio-Economics and Community

The socio-economic impact assessment presented within the original ES assessed the potential impact of the proposals on local businesses, industry, housing, existing facilities and services, and identified development and change likely to be facilitated or inhibited by the proposal. The design changes do not impact the findings of the original assessment. Overall, it is considered that with the appropriate mitigation measures, the potential impacts of the proposal on the defined social and economic environment would be positive.

Potential impacts during the operation of the proposal remain dependant on the nature of identified receptors, which have not changed as a result of the proposed design changes. Despite the layout of the Exemplar Development being adjusted, the quantum of the development remains as assessed within the original assessment. The quality and capacity of education facilities and provision of affordable housing, remain unchanged as a result of the redesign.

### 3.12 Waste

The Site Waste Management Plan referenced in the November 2010 Environmental Statement has been updated to account for the latest design. However, despite the design changes, estimated excavation volumes remain unchanged from those assessed within the original ES and SWMP. The alignment, location, level and grading of the development has been designed to minimise excavation volumes and this remains unchanged in the new design. The management of construction waste remains unchanged and mitigation measures including the plan to manage waste through the implementation, monitoring and auditing of the SWMP also remain unaffected.

The Sustainable Waste and Resources Plan (SWRP) previously prepared for the operational phase to set targets for residual waste levels, recycling levels and landfill diversion has also been updated to reflect the latest design. However, effects of waste generated in the operational phase of the Exemplar Development remain as assessed within the original ES. The design changes do not impact the total number or mix of units making up the development and therefore anticipate waste volumes generated from the Exemplar Development will not change.

Overall, the new design proposal does not affect the impact on waste generated from excavation, construction or operation. As such, the potential environmental impacts of waste materials in relation to the proposed development remain as assessed within the original ES.

### 3.13 Transport

The design amendments made to the Exemplar application do not affect transport impacts assessed within the original ES.

Despite design changes including a looser and more varied road pattern within the development site, the location of access points to the public highway remain as assessed within the November 2010 ES. The amended proposed layout of the Exemplar Development continues to incorporate a design facilitating easy movement by foot and cycle. Traffic speed restrictions within the development continue to be proposed, with well lit, high quality walking and cycling routes being provided throughout the site, utilising the network of streets and segregated routes to provide shorter connections between areas.

The original assessment demonstrated that the Exemplar Development traffic will have a negligible impact upon severance, pedestrian delay, pedestrian amenity, fear and intimidation, hazardous loads, and dust and dirt. These impacts remain unchanged as a result of the proposed design changes.

An assessment on driver delay, and accidents and safety was undertaken for the original ES, taking into account the impacts of other committed developments in the area. It was concluded that a negligible impact on receptors in the study area would be experienced, related to driver delay, and accidents and safety. Overall, there will be a negligible effect upon sensitive receptors from traffic and transport during the construction and operational phases of the Exemplar Development. There is no change to this initial assessment.

During construction it is anticipated that virtually all construction traffic for the Exemplar Development will use the A4421 around the eastern side of Bicester (due to weight limit restrictions on the A4095) and the A41 Oxford Road via the M40 Junction 9. This proposal remains as assessed within the November 2010 ES.

### 3.14 Interrelationships and Cumulative Effects

Cumulative effects associated with the Exemplar Development design changes have been considered. In order to fully assess any cumulative impacts, the combined effects of the Exemplar with other developments within the vicinity of the site, the combined effects of the Exemplar with the NW Bicester Eco Development, and the combined effects of different environmental aspects of the Exemplar Development on a particular receptor have all been considered.

The potential cumulative effects with other developments were identified within the original ES as likely to be during the construction phase on traffic and transport, air quality and noise and vibration associated with the combined effect of construction vehicles and operation of

machinery. No changes to these impacts have been realised as a result of the Exemplar design changes and as a result, no cumulative impacts are predicted.

Similarity, as identified within the original ES no likely cumulative effects are anticipated during the operational phase of these other developments.

Within the original Exemplar ES, combined or impact interactions were reported as likely to occur during the construction phase. Each environmental chapter identified mitigation measures to reduce impacts. Following implementation of these mitigation measures, the ES concluded that there may still be combined effects of noise from construction vehicles and road traffic, and dust emissions from construction vehicles and construction activities. As summarised within this Addendum, effects of noise and dust as a result of Exemplar design changes remain as assessed within the original ES. As a result, it remains that no cumulative impacts are predicted.