

15 SUMMARY AND RESIDUAL EFFECTS

Introduction

15.1 This chapter summarises the mitigation measures and residual effects identified in each of the technical assessments included in the ES, which has been prepared to accompany an outline planning application for the development of up to 530 residential dwellings, open space, landscaping and associated infrastructure on land to the north west of Bicester in Oxfordshire.

Mitigation Measures

15.2 The Development has been subject to an iterative design process. As this process progressed measures have been incorporated into the development parameters in order to avoid, reduce or offset significant environmental effects. The measures incorporated into the Development parameters are set out in Chapter 3 of this ES and include:

- Provision of landscape buffers on the western boundary of the Site;
- Inclusion of a viewing corridor to protect views to the Grade II* Listed church of St Laurence; and
- Inclusion of large areas of open space for recreation and drainage provision.

15.3 Where this has not been possible, further mitigation measures have been proposed and are set out in Table 15.1 along with the requisite mechanism for securing the proposed mitigation.

Table 15.1: Schedule of Mitigation

Effect	Mitigation	Mechanism for securing Mitigation
Transport and Access		
<i>Construction Phase</i>		
Severance	Implementation of CEMP/CTMP and Travel Plan	CEMP and CTMP secured through planning Conditions
Driver Delay		
Pedestrian/Cyclist Delay & Amenity		
Fear & Intimidation		
Accidents and Road Safety		
<i>Completed Development</i>		
Driver Delay	Signalised junction provided at Charlotte Avenue in the future	Provided through other planning applications
Air Quality		
<i>Construction Phase</i>		

Effect	Mitigation	Mechanism for securing Mitigation
Earthworks	Implementation of CEMP	CEMP secured through planning Condition
Construction	Implementation of CEMP	
Trackout	Implementation of CEMP	
<i>Completed Development</i>		
No additional mitigation required.		
Noise and Vibration		
<i>Construction Phase</i>		
Construction Noise	Implementation of CEMP	CEMP secured through planning Condition
Construction Vibration	Implementation of CEMP	CEMP secured through planning Condition
<i>Completed Development</i>		
Noise Intrusion for Site Suitability	A suitable glazing and ventilation strategy and consideration of internal and external layout	Secured at the detailed design stage through planning conditions
Landscape and Views		
<i>Construction Phase</i>		
Construction scoped out of assessment		
<i>Completed Development</i>		
No additional mitigation over and above mitigation embedded in the Development Parameters.		
Biodiversity		
<i>Construction Phase</i>		
Bure Park LNR	<ul style="list-style-type: none"> • Pollution prevention measures • Pollution prevention and dust management measures • Routing of construction traffic away from sensitive areas • Pollution prevention and dust management measures • Routing of construction traffic away from sensitive areas • Tree protection in line with arboriculturist best practice • Pollution prevention and dust management measures • Routing of construction traffic away from sensitive areas • Tree protection in line with arboriculturist best practice • Sensitive positioning of temporary lighting • Pre-construction badger survey • Construction safeguards • Sensitive timing of construction works • Systematic search and supervised displacement exercise by a suitable qualified and experience ecologist with relocation of reptiles/amphibians to suitable retained on-site habitat 	Secured through planning conditions
Semi-improved Grassland		
Hedgerows, Treelines and Woodland		
Scattered Trees		
Off-site Watercourses		
Roosting Bats (Trees)		
Badger		
Breeding Birds		
Reptiles		
Common Amphibians		
<i>Completed Development</i>		
Semi-improved grassland	• Long-term management through a Landscape and Ecology Management Plan	Secured through
Hedgerows, Treelines and		

Effect	Mitigation	Mechanism for securing Mitigation
Woodland		
Roosting Bats (Trees)	<ul style="list-style-type: none"> • Sensitive lighting scheme • Provision of bat boxes and integrated root units • Long-term management 	planning conditions
Commuting and Foraging Bats	<ul style="list-style-type: none"> • Sensitive lighting scheme • Long-term management 	
Badger		
Other Mammals	<ul style="list-style-type: none"> • Sensitive lighting scheme • Provision of hedgehog domes and hedgehog highways/fence gaps as enhancements • Long-term management 	
Breeding Birds	<ul style="list-style-type: none"> • Provision of new bird boxes and integrated birdboxes • Sensitive timing of works • Long-term management • Sensitive lighting scheme 	
Reptiles	<ul style="list-style-type: none"> • Long-term management 	
Common Amphibians	<ul style="list-style-type: none"> • Provision of hibernacula and log piles 	
Brown Hairstreak	<ul style="list-style-type: none"> • New planting to comprise high proportion of Blackthorn and some Ash • Long term management to comprise rotational cutting of sections • Provision of invertebrate hotels and butterfly bank 	
Built Heritage		
<i>Construction Phase</i>		
Construction scoped out of assessment		
<i>Completed Development</i>		
No additional mitigation required over and above the measures included in the Development Parameters.		
Population and Human Health		
<i>Construction Phase</i>		
Wider Human Health	Effects would be localised and temporary and controlled using measures set out in the CEMP.	Planning conditions
<i>Completed Development</i>		
No additional mitigation required		
Water Resources and Flood Risk		
<i>Construction Phase</i>		
Flood Risk	CEMP	Secured through planning conditions
Surface Water Drainage	CEMP/Oxfordshire County Council Standards	
Surface Water Quality	CEMP/CIRIA Sustainable Drainage Manual	
Groundwater Quality	CEMP/CIRIA Sustainable Drainage Manual	
Wastewater Generation	CEMP	
Potable Water (Demand & Supply)	CEMP	
<i>Completed Development</i>		
Surface Water Drainage	Sustainable Drainage Measures	Planning conditions and reserved matters
Surface Water Quality		
Groundwater Quality		
Wastewater Generation	Network reinforcement	Provided by external water authority.
Potable Water (Demand & Supply)	Rainwater harvesting taps etc Network reinforcement	Planning conditions and reserved matters
Climate Change		
<i>Construction Phase</i>		

Effect	Mitigation	Mechanism for securing Mitigation
Scope 1 Emissions (direct emissions from combustion of fuels on site)	Implementation of a CEMP	Secured through planning conditions
Scope 2 Emissions (indirect emissions from purchased electricity)	Implementation of a CEMP	
Scope 3 Emissions (indirect emissions from embodied carbon from purchased materials)	Implementation of a CEMP and site waste management plan	
Disruption to construction programme or to worker health as a result of climate change	Implementation of a CEMP	
<i>Completed Development</i>		
Scope 1 Emissions (direct emissions from transport and gas emissions)	Implementation of a Travel Plan	Secured through planning conditions
Scope 2 Emissions (indirect emissions from purchased electricity)	Energy efficiency measures and renewable/low carbon technology to be confirmed at detailed design	
Scope 3 Emissions (indirect emissions from waste and water management and supply)	Water efficiency measures and provision for recycling	
Heatwaves	Implementation of a Landscape and Ecology Management Plan (LEMP)	
Low Rainfall and Drought	Implementation of a LEMP Water efficiency measures to be confirmed at detailed design	
Heavy Rainfall and Flooding	Sustainable Drainage	

15.4 Following implementation of the mitigation measures the residual effects of the Development are set out in Table 15.2.

Table 15.2: Significance Table

Stage	Effect	Residual Significance
Transport and Access		
Construction	Severance	Negligible Adverse
	Driver Delay	Negligible Adverse
	Pedestrian/Cyclist Delay & Amenity	Negligible Adverse
	Fear & Intimidation	Negligible Adverse
	Accidents and Road Safety	Negligible Adverse
Completed Development	Severance	Negligible Adverse
	Driver Delay	Moderate Adverse
	Pedestrian/Cyclist Delay & Amenity	Negligible Adverse
	Fear & Intimidation	Negligible Adverse
	Accidents and Road Safety	Negligible Adverse
Air Quality		
Construction	Earthworks	Negligible
	Construction	Negligible
	Trackout	Negligible

Stage	Effect	Residual Significance
Completed Development	Effect of NO ₂ emissions generated by road vehicles movements during operational phase	Negligible
	Effect of PM ₁₀ emissions generated by road vehicle movements during operational phase	Negligible
	Effect of PM _{2.5} emissions generated by road vehicle movements during operational phase	Negligible
Completed Development	Effects of NO _x emissions generated by road vehicle movements during the operational phase	Negligible
Noise and Vibration		
Construction	Construction Noise	Minor Adverse
	Construction Vibration	Negligible
Completed Development	Road Traffic Noise	Moderate Adverse (not significant)
	Noise Intrusion for Site Suitability	Negligible
Landscape and Views		
Construction	Scoped out	
Completed Development	Effects on landscape character – within site and immediate surroundings	Moderate-Slight Adverse
	Effects on landscape character – north-west of site up to 0.5km	Slight Adverse
	Effects on landscape character – north-west of site between 0.5 – 1km	Minimal Neutral
	Effects on landscape character elsewhere within the study area	Minimal Neutral
	Effects on Visual Receptor Group 1: Residents and visitors of exemplar phase development to north of the Site	Slight Neutral
	Effects on Receptor Group 2: Residents of Exemplar phase development to the south of the Site	Slight Neutral
	<i>Effects on Wintergreen Fields</i>	<i>Moderate Adverse</i>
Receptor Group 3: Recreational users and motorists within the countryside to the south-east / south / south-west of the Site,	Minimal Neutral	

Stage	Effect	Residual Significance
	between the Site, Calversfield and Bicester	
	Receptor Group 4: Recreational users and motorists within the countryside to the east / north-east of the Site, between the Site, Bucknell and wooded ridge	Slight Adverse
	<i>Effects on PRow 148/7</i>	<i>Moderate Adverse</i>
	Visual effects on key routes: B4100 Banbury Road	Slight Neutral
Biodiversity		
Construction Phase	Bure Park LNR	Negligible
	Ardley Cutting and Quarry SSSI	Negligible
	Oxford Meadows SAC	Negligible
	Twelve Acre Copse Oxfordshire LWS	Negligible
	Skimmingdish Lane Balancing Pond Cherwell DWS	Negligible
	Semi-improved Grassland	Negligible
	Hedgerows, Treelines and Woodland	Negligible
	Scattered Trees	Negligible
	Off-site Watercourses	Negligible
	Roosting Bats (Trees)	Negligible
	Commuting and Foraging Bats	Negligible
	Badger	Negligible
	Other Mammals	Negligible
	Breeding Birds	Negligible
	Reptiles	Negligible
	Common Amphibians	Negligible
Brown Hairstreak	Negligible	
Completed Development	Bure Park LNR	Negligible
	Ardley Cutting and Quarry SSSI	Negligible
	Oxford Meadows SAC	Negligible
	Twelve Acre Copse Oxfordshire LWS	Negligible
	Skimmingdish Lane Balancing Pond Cherwell DWS	Negligible
	Semi-improved Grassland	Minor Beneficial
	Hedgerows, Treelines and Woodland	Minor beneficial
	Scattered Trees	Negligible
	Watercourses	Negligible
	Roosting Bats (Trees)	Minor beneficial
	Commuting and Foraging Bats	Negligible
	Badger	Negligible
	Other Mammals	Negligible

Stage	Effect	Residual Significance
	Breeding Birds	Minor beneficial
	Reptiles	Minor beneficial
	Common Amphibians	Minor beneficial
	Brown Hairstreak	Minor beneficial
Built Heritage		
Construction Phase	N/A	
Completed Development	Setting / experience of St Laurence Grade II* Listed Building	No effect
	Setting of Home Farmhouse Grade II Listed Building	No significant effect
Population and Human Health		
Construction Phase	Employment	Minor beneficial
	Wider Human Health	Negligible
Completed Development	Housing	Moderate beneficial
	Household Expenditure	Minor beneficial
	Early Years Education/childcare	Negligible
	Primary Education	Negligible
	Secondary Education	Negligible
	GP Provision	Minor adverse
	Dentist Provision	Negligible
	Wider Human Health	Minor beneficial
	Open Space	Major beneficial
Water Resources and Flood Risk		
Construction Phase	Flood Risk	Negligible
	Surface Water Drainage	Negligible
	Surface Water Quality	Negligible
	Groundwater Quality	Negligible
	Wastewater Generation	Negligible
	Potable Water (Demand & Supply)	Minor (Adverse)
Completed Development	Flood Risk	Minor (Adverse)
	Surface Water Drainage	Minor (Adverse)
	Surface Water Quality	Negligible
	Groundwater Quality	Negligible
	Wastewater Generation	Negligible
	Potable Water (Demand & Supply)	Minor (Adverse)
Climate Change		
Construction Phase	Scope 1 Emissions (direct emissions from combustion of fuels on site)	Minor Adverse
	Scope 2 Emissions (indirect emissions from purchased electricity)	Minor Adverse
	Scope 3 Emissions (indirect emissions from embodied carbon from purchased materials)	Minor Adverse
	Disruption to construction programme or to	Negligible

Stage	Effect	Residual Significance
	worker health as a result of climate change	
Completed Development	Scope 1 Emissions (direct emissions from transport and gas emissions)	Minor Adverse
	Scope 2 Emissions (indirect emissions from purchased electricity)	Negligible
	Scope 3 Emissions (indirect emissions from waste and water management and supply)	Minor Adverse
	Long term changes to climate norms	Negligible
	Heatwaves	Negligible (infrastructure, land stability, ecology, landscaping and planting) Minor Adverse (future users)
	Low Rainfall and Drought	Negligible
	Heavy Rainfall and Flooding	Negligible to Minor Adverse

Interactive Effects

15.5 Regulation 4(2) states that an ES must include a description of the aspects of the environment likely to be significantly affected by the Development and the interrelationship between these effects. There is no published methodology for determining the significance of interactive or synergistic effects. Combining effects with respect to one environmental discipline with another has to be qualitative and is necessarily based on judgment. Therefore, a matrix system has been used to indicate where such effects would likely occur for the construction and operational phases, highlighting where effects occur to a common receptor. The findings of this exercise are set out in Table 15.3 below.

Table 15.3: Interactive Effects

Effect	Local Population	Landscape and Views	Users of the Local Road Network	Biodiversity
Construction Phase				
Views of vehicles and machinery being used during the construction period	*	*	*	
Disruption to users of the local road network			*	
Construction dust	*	*		*
Construction noise (plant and machinery)	*	*		*
Creation of construction employment	*			
Operational Phase				

Effect	Local Population	Landscape and Views	Users of the Local Road Network	Biodiversity
Views of the Development	*	*	*	
Effects to the Highway network	*		*	
New housing opportunities	*			
Operational phase traffic emissions	*			*
New Public Realm Creation	*	*		*

*indicates where an effect may occur.

- 15.6 Appropriate mitigation during the construction phase has been identified in the ES as necessary, such as best practice measures to reduce or eliminate potential adverse environmental effects of construction as far as possible. Furthermore, the Construction Methodology and Phasing Chapter (Chapter 5) proposes a programme which will ensure that the Development would be implemented in the most efficient manner. This includes measures set out and secured through the implementation of a CEMP for the Development (see Chapter 5 for further details). Relevant legislative requirements would also need to be adhered to.
- 15.7 During the construction phase it is considered that interactions could potentially occur between local population effects, transport effects and visual effects. It is considered that interactive effects during construction on the surrounding area would range from negligible to major adverse at worst. Any major adverse effects would be temporary in duration and are likely to be associated only with the peak periods of construction activity. During the operational phase it is considered that interactions could potentially occur in terms biodiversity and population and human health. It is considered that the interactive effects during operation of the Development on the surrounding area would range from negligible to beneficial.

Cumulative Effects Summary

- 15.8 Each of the technical assessments considers the likely significant cumulative effects of the Development with the cumulative schemes set out in Chapter 2.
- 15.9 The technical assessments identified the following significant beneficial cumulative effects:
- Major beneficial effects on housing provision;
 - Major beneficial effects on household expenditure; and
 - Major beneficial effects on operational employment.
- 15.10 The technical assessments identified the following significant adverse cumulative effects:

- Moderate adverse effects on driver delay on completion of the Development;
- Moderate adverse effects on local landscape character; and
- Moderate to major adverse effects on recreational users and motorists (visual receptors) within the countryside surrounding the Development.

Conclusions

15.11 In summary, the Development, which includes the mitigation incorporated into the Development Parameters and the additional mitigation which will be secured through planning conditions and the detailed design (to be addressed at the reserved matters stages), will result in the following significant beneficial residual effects on the environment:

- Moderate beneficial effect on housing provision; and
- Major beneficial effect in terms of open space provision.

15.12 The ES has also identified the following significant adverse residual effects on the environment:

- Moderate adverse effects on driver delay on completion of the Development;
- Moderate adverse effects on completion of the Development to Wintergreen Fields and public right of way 148/7; and
- Moderate to slight adverse effects on landscape character on completion of the Development.