



Environmental Statement (ES) Update

DOCUMENT 2

June 2009

This page has intentionally been left blank.

Outline Planning Application for a New Settlement at Curborough, Staffordshire

Environmental Statement Update

(June 2009)

on behalf of

The Curborough Consortium

Report Production


RPS – Chapters 1, 2, 3, 4, 5, 6, 10 and 11

Cooper Partnership – Chapter 7

Atkins – Chapters 8, and 9

*This report has been prepared by Atkins Consultants Limited, RPS and Cooper Partnership for the sole and exclusive use of the **Curborough Consortium**. Any other party using the information contained within this report for any purpose whatsoever, do so of their own risk, and any duty of care or fitness for purpose to that party is excluded.*

Document History

JOB NUMBER: 5055875			DOCUMENT REF: Fradley Village ES update.doc			
0	DRAFT 1	YP	YP	JD	DB	30.04.09
01	Draft with clients comments	YP	YP	JD	DB	08.05.09
02	Final	YP	YP	JD	DB	May 2009
Revision	Purpose Description	Originated	Checked	Reviewed	Authorised	Date
						

This page has intentionally been left blank.

Contents

Section	Page
Abbreviations	vii
Introduction	10
1.1 Background	10
1.2 Environmental Statement	10
1.3 Consultation Responses	10
1.4 Format of the Environmental Statement Update	11
2. Application Site	13
2.1 Site Description	13
2.2 New Settlement Application Site Area	13
3. Proposed Development	14
3.1 The Proposed Development	14
3.2 Key Principles and Objectives	20
4. Alternative Sites and Options	22
4.1 Introduction	22
4.2 Lichfield District Core Strategy	23
4.3 Suitability & Sustainability	24
4.4 West Midlands RSS	25
4.5 Lichfield Housing Land Supply	26
5. Planning Policy	27
5.1 Introduction	27
5.2 Regional Spatial Strategy	27
5.3 Staffordshire and Stoke-on-Trent Minerals Local Plan	27
5.4 Lichfield Local Plan	28
6. Ecology and Nature Conservation	29
6.1 Introduction	29
6.2 Reasons for the Update	29
6.3 The Study Area	30
6.4 Methodology	30
6.5 Results	34
6.6 Field Survey	35
6.7 Operational Impacts	48
6.8 Mitigation Measures	52
6.9 Habitat Creation and Management	52
6.10 Off-Site Mitigation for Arable Loss	54
6.11 Lighting Mitigation	59
6.12 Cumulative Impacts	62
6.13 Conclusions	64
6.14 Regional Biodiversity Strategy - the West Midlands Biodiversity Partnership	70
6.15 Summary	74

7.	Landscape Character and Visual Impact Assessment	76
7.1	Introduction	76
7.2	The Study Area	76
7.3	Method Statement	76
7.4	Criteria for Landscape Impacts	77
7.5	Criteria for Visual Impacts	77
7.6	Baseline Conditions	77
7.7	Assessment of Visual Impact during Construction	79
7.8	Assessment of Visual Impacts on Completion	80
7.9	Mitigation and Enhancement	80
7.10	Residual Impacts	81
7.11	Summary	81
7.12	Summary of Consultation Responses	82
8.	Hydrology and Water Quality	87
8.1	Introduction	87
8.2	Fluvial Flood Risk	88
8.3	Groundwater Flooding	90
8.4	Assessment of infrastructure failure and flooding	90
8.5	Surface Water Drainage Strategy - SUDS	91
8.6	Surface Water Control Strategy – Construction Phases	93
8.7	Foul Water Drainage System	94
8.8	Water Supply and Water Use	95
9.	Land Use, Geology and Soils	96
9.1	Introduction	96
9.2	Archaeological Investigation	96
9.3	Minerals Objection	96
10.	Cultural Heritage	100
10.1	Introduction	100
10.2	Planning Context	100
10.3	Methodology	100
10.4	Existing Conditions	101
10.5	Immediate Impacts	102
10.6	Mitigation Measures	103
10.7	Residual Impacts	106
10.8	Conclusion	107
11.	Socio Economic Factors	108
11.1	Introduction	108
11.2	Employment	108
11.3	Impact on Local Community Facilities	110
12.	References	115

List of Tables

Table 3.1 - Revised Land Use Budget	18
Table 3.2 - Local Centre Area Breakdown	19
Table 6.1 - Updated Species Records for Curborough	35
Table 6.2 - Location and size of GCN populations	38

Table 6.3 - Summary of Bat Transect Data - Number of Bats Identified Per Habitat (2007/8 Results)	39
Table 6.4 - Birds of Conservation Concern Identified from Survey	41
Table 6.5 - Fullers' Classification Values of Species-Richness of Bird Sites	42
Table 6.6 - Tables of Habitat Loss / Gain	44
Table 6.7 - Revised Summary of Construction Impacts	50
Table 6.8 - Revised Summary of Operational Effects	52
Table 6.9 - Table of Residual Effects	60
Table 6.10 - Current / Approved Planning Applications of Relevance to Site	62
Table 6.11 - Meeting Staffordshire BAP Targets	72
Table 7.1 - Character Areas and Types within the Site character defined by the Structure Plan 1996-2011	77
Table 7.2 - Summary of Consultation responses	82
Table 11.1 - Employment Generated	109
Table 11.2 - POS Provision on Site	110

Appendices

Appendix A - Chapters 1-5

A.1	Figure 2.1 – Application Site Plan RPS1
A.2	Figure 3.1 – Illustrative Masterplan
A.3	Figure 4.1 – SHLAA Assessment Site Plans of Fradley: Site 42
A.4	Figure 5.1 – Minerals Consultation Zone Plan
A.5	Figure 5.2 – Lichfield District Local Plan – Inset Plan 12: Fradley
A.6	Figure 5.3 – Staffordshire Minerals Core Strategy Key Diagram
A.7	Figure 5.4 – Staffordshire Minerals Core Strategy Site Proposals 2008
A.8	Figure 5.4b - Staffordshire Minerals Core Strategy Submitted site proposals update February 2009
A.9	West Midlands Regional Spatial Strategy Phase Two Revision Preferred Options Submission Representations On Behalf of The Curborough Consortium December 2008
A.10	Lichfield District Local Development Framework Core Strategy Preferred Options Representations On Behalf of The Curborough Consortium January 2009

Appendix B - Ecology and Nature Conservation Chapter 6

B.1	Figure 9.1 Phase 1 Habitat Survey
B.2	Figure 9.2 Badger Bait Marking Results
B.3	Figure 9.3a Ponds for Great Crested Newts
B.4	Figure 9.3b Ponds assessed for Great Crested Newts Potential (letters)
B.5	Figure 9.4a Bat Activity Map (Overall)
B.6	Figure 9.4b Location of confirmed bat roosts
B.7	Figure 9.4c Walked Bat Transect 1 – Park and Ride 6.05.08
B.8	Figure 9.4d Walked Transect 2 –Tertiary Road 30.05.08
B.9	Figure 9.4e Walked Transect 3 –Secondary Road Link 27.05.08
B.10	Figure 9.4f Walked Transect 4 –12.06.08 (Fradley Wood) WWII Hangars
B.11	Figure 9.4g Walked Transect 5 – 12.05.08 The Spinney (Fradley Wood)
B.12	Figure 9.4h Walked Transect 6 – 17.05.08 (land south of Wood End Lane)
B.13	Figure 9.4i Walked Transect 7 – 17.06.08 (land around Wood End Lane)
B.14	Figure 9.4j Walked Transect Hedgerows East of Rose Cottage 17.06.08
B.15	Figure 9.4k Walked Transect 9 (Netherstone Lane) 01.07.08
B.16	Figure 9.4L Walked Transect 10 (Fradley Wood)
B.17	Figure 9.5 Riparian Mammal survey updated May 2008
B.18	Figure 9.6a Breeding Bird Map 1

- B.19 Figure 9.6b Breeding Bird Map 2 (Land South of Wood End Lane)
- B.20 Figure 9.6c Breeding Bird Map 3 (Curborough Farm to East Hill)
- B.21 Figure 9.6d Breeding Bird Map 4 (Tertiary Road Link)
- B.22 Figure 9.6e Breeding Bird Map 5 (Secondary Road Link)
- B.23 Figure 9.6f Breeding Bird Map 6 (Park and Ride)
- B.24 Figure 9.7 Wintering Bird Survey Transect
- B.25 Figure 9.8 Hedgerow Survey
- B.26 Figure 9.9 Invertebrate Survey
- B.27 Figure 9.10 Off-site Grassland Mitigation
- B.28 Invertebrates recorded from Fradley Wood and surrounds, Curborough; September 2008
- B.29 UK BAP moths recorded from Fradley Wood (list provided by Staffordshire wildlife trust)
- B.30 Curborough, Staffordshire: Invertebrate Survey – Report to RPS Group Plc
- B.31 Curborough Staffordshire: Ecology Badger Bait Marking Survey 2008
- B.32 Curborough Staffordshire: Ecology Updated Bat assessment 2008
- B.33 Curborough Park and Ride and Access Roads: Appendix 9.6b Breeding Bird Assessment
- B.34 Curborough Staffordshire: Ecology Updated Great Crested Newt Survey 2008
- B.35 Curborough Staffordshire: Ecology Updated Hedgerow Report 2008
- B.36 Curborough Staffordshire: Ecology Riparian Mammal Survey
- B.37 Curborough Staffordshire: Ecology Wintering Bird Assessment

Appendix C - Landscape Character and Visual Impact Chapter 7

- C.1 Figure 10.1 Topography and Viewpoints
- C.2 Figure 10.2 Landscape Character
- C.3 Figure 10.4 Visual Envelope-Existing Site
- C.4 Figure 10.5 Landscape Master Plan (Illustrative)
- C.5 Figure 10.6 Zone of Visual Influence and During Construction/On Completion
- C.6 Figure 10.7 Zone Of Visual Influence and Visual Impact Assessment 20 Years after Completion
- C.7 Site Photographs (New photo sheets 5 sheets)
- C.8 Analysis of Tree Condition Survey (5 sheets)
- C.9 Tree and Hedgerow Retention/Removal (5 sheets)
- C.10 Landscape Character Area 67 and Landscape Character Area 68
- C.11 Staffordshire Historic Landscape Character Map (3 sheets)
- C.12 Plant Schedule
- C.13 Landscape Impact Table L1
- C.14 Visual Impact Table L2
- C.15 Lichfield District Council TPO No 1-1959; No 175-1997; Alrewas; No 3; and No 23
- C.16 Landscape Management Framework
- C.17 Figure 10.11 Additional Viewpoints
- C.18 Staffordshire Landscape Character Types

Appendix D - Hydrology and Water Quality Chapter 8

- D.1 11.A Updated Services Report
- D.2 11.B British Waterways Correspondence for section 11
- D.3 11.B Curborough BrK_Buildings
- D.4 11.C British Waterways Correspondence for section 11
- D.5 Curborough Development Fluvial Hydraulic Model Figure A1
- D.6 Curborough Development Fluvial Hydraulic Model Results Figure A3
- D.7 Curborough Development Lidar Coverage Figure A4
- D.8 Curborough Brook Cross Sections

- D.9 Curborough Flood Risk Study (s-curb 11 – 24)
- D.10 Curborough /Pyford Brook Model Schedule
- D.11 Schedule of Structures
- D.12 CURB_2770 – Curborough Development Fluvial Model Build and Validation
- D.13 Calculations of Manning's 'n'
- D.14 Curborough Development: Curborough /Pyford Fluvial Hydraulic Model Build and Validation Report

Appendix E – Land Use, Geology and Soils.

- E.1 David Walker Minerals Survey Report

Abbreviations

Abbreviation	Full Term Description
AOD	Above Ordnance Datum
BAP	Biodiversity Action Plan
BAS	Biodiversity Action Site
BEA	Biodiversity Enhancement Area
BW	British Waterways
DC	District Council
DCSF	Department for Children, Schools and Families
DCSF	Department for Children, Schools and Families
DETR	Department of the Environment Transport and the Regions
DLW	David L Walker Chartered Surveyors
DPD	Development Plan Document
EA	Environment Agency
EIA	Environmental Impact Assessment
ES	Environmental Statement
FEH	Flood Estimate Handbook
FRA	Flood Risk Assessment
GCN	Great Crested Newt
HECRAS	Hydrologic Engineering Centres River Analysis System
HER	Historic Environment Record
HLCA	Historic Landscape Character Areas
HLCT	Historic Landscape Character Types
JNCC	Joint Nature Conservation Committee
LAP	Local Area for Play
LBAP	Local Biodiversity Action Plan
LDC	Lichfield District Council
LDF	Local Development Framework
LEA	Local Education Authority
LEAP	Locally Equipped Area for Play
LIA	Landscape Impact Assessment
MCA	Mineral Consultation Area
MCS	Minerals Core Strategy
MUA's	Major Urban Areas

MUGA	Multi Use Games Area
NEAP	Neighbourhood Equipped Area for Play
NERC	National Environment Research Council
NHPAU	National Housing and Planning Advisory Unit
NLP	Nathaniel Lichfield Partnership
P & R	Park and Ride
PCT	Primary Care Trust
PfS	Partnership for Schools
POS	Public Open Space
PPS	Planning Policy Statement
PPS3	Planning Policy Statement 3: Housing
RCA	Regional Character Area
RPG	Regional Policy Guidance
RSS	Regional Spatial strategy
SAC	Special Areas of Conservation
SAM	Scheduled Ancient Monuments
SBI	Sites of Biological Importance
SCC	Staffordshire County Council
SHLAA	Lichfield District Council's Draft Strategic Housing Land Availability Assessment 2008
SPA	Special Protection Areas
SSSI	Site of Special Scientific Interest
SSW	South Staffordshire Water
STW	Severn Trent Water
SUDS	Sustainable Urban Drainage System
TPO	Tree Preservation Order
UK BAP	UK Biodiversity Action Plan
VE	Visual Envelope
VIA	Visual Impact Assessment
WMRA	West Midlands Regional Assembly
WMRES	West Midlands Regional Economic Strategy
WMRSS	West Midlands Regional Spatial Strategy
ZVI	Zone of Visual Influence

Introduction

1.1 Background

- 1.1.1 This document has been prepared as an update to the original Environmental Statement (ES) (Document 2) that was prepared on behalf of the Curborough Consortium, to accompany the planning application 08/00342/OUT that was submitted to Lichfield District Council 28 March 2008 for the development of a new settlement at Curborough. This document is to be read in conjunction with the original ES. This Update to the ES provides updated technical and survey data whilst countering some of the technical and policy objections that have been raised through the application's post-submission consultation period. As agreed with Officers of the Local Planning Authority, it addresses all matters except for Transport, Air Quality and Noise which will be addressed through a further update document.
- 1.1.2 The ES is concerned with proposals to create a new settlement north of Lichfield at Fradley; **Figure 2.1** 'Application Site' (in Appendix A) identifies the extent of the application area. The extent of the application site is unchanged from the original submission, although further areas of the locality have been surveyed in respect of ecology and drainage, the details of which are contained in the relevant chapters of this Update. The proposed settlement is outlined in detail in Chapter 3.
- 1.1.3 The new settlement proposals will be based on land around the former Fradley airfield, which has been part developed for employment uses at Fradley Park. In line with the site's previous identification in the Structure Plan, the presence of Fradley Park, being one of the Region's largest employment locations (3,500 jobs existing and expanding to around 7,000 jobs over the next 18 – 20 years) provides a principal basis for developing a substantial residential development with supporting community uses, thus enabling a sustainable mixed use settlement to result.
- 1.1.4 Related figures within this chapter are contained within Appendix A of this document.

1.2 Environmental Statement

- 1.2.1 Copies of this ES Update and the original ES can be sourced from RPS Planning and Development, Highfield House, 5 Ridgeway, Quinton Business Park, Birmingham, B32 1AF at a cost of £40 for a complete hard copy of the document or alternatively £10 for a CD-Rom containing electronic formats of the document. This is considered to be a reasonable charge reflecting printing and distribution costs in accordance with the requirements of Regulation 17.
- 1.2.2 This ES Update represents a new stage of assessment and is not provided as an update of the original ES. Discrete updates are contained in regard to technical data, survey results and policy implications to facilitate the consideration of the proposed development. The updates supplied are relayed through the same arrangement as the original ES and considered through the same chapter subjects.

1.3 Consultation Responses

- 1.3.1 This ES Update will address the principal material considerations in relation to technical matters and policy that have been raised through these consultation responses.
- 1.3.2 An ES considers not only the negative impacts and any appropriate mitigation measures but also the positive effects of the development. This ES Update is prepared in accordance with the EIA Regulations 1999 and the DETR Circular 02/99, Environmental Impact Assessments, March 1999. Extended reference is made to the DETR's guide to procedures on EIA. All applicable British

Standards have been referred to where relevant within the ES and additional guidelines, methods and techniques have been considered under appropriate environmental topic areas.

1.4 Format of the Environmental Statement Update

1.4.1 Having regard to the original ES, the ES Update follows the same format:

1.4.2 **Chapter 1 – Introduction:** This Chapter introduces the purpose of the ES Update and consultations with bodies such as statutory undertakers and relevant authorities.

1.4.3 **Chapter 2 – Application Site and Environs:** This Chapter relates to the ES study area and identifies any variations as a result of the additional survey work undertaken, or whether amendments are required to address specific issues.

1.4.4 **Chapter 3 – Proposed Development:** This Chapter defines the proposed development, including any additional uses and documents the variations proposed through the Illustrative Masterplan layout and related documentation. A number of plans that were originally prepared as part of the planning application documentation have been amended, including the Illustrative Masterplan, Site Wide Illustrative Masterplan and “Parameter Plans”.

1.4.5 **Chapter 4 – Alternative Sites and Options:** The 1999 EIA Regulations require an outline of the main alternatives studied by the applicant to be included in an ES alongside an indication of the main reasons for the development choice, taking into account the environmental effects. In order to provide an outline of the alternatives to the proposed settlement, other methods of providing housing to meet the identified need have been assessed further, through a review of alternative sites and development strategies. This Chapter provides an updated assessment of the housing strategy for the Lichfield District area in relation to the progressed LDF, West Midlands RSS and consultation responses.

1.4.6 **Chapter 5 – Planning Policy Review:** This chapter of the ES Update is concerned with whether the proposed scheme will be consistent with recent planning revisions and environmental policy at national, regional and local levels. The Chapter’s assessment should be read as an addition to previously provided planning policy documents and not as a replacement.

1.4.7 **Chapter 6 – Ecology and Nature Conservation:** The Ecological Assessment Chapter refers to additional ecological surveys that have been requested from the LPA ecologist in respect of:

- Badger bait-marking studies;
- Detailed plant surveys in Fradley Wood;
- Detailed invertebrate surveys in Fradley Wood.

1.4.8 This chapter reflects negotiations with statutory consultees in respect of ecology and landscape concerning the Illustrative Masterplan, especially in relation to woodland and hedgerow retention and establishment of new habitats.

1.4.9 **Chapter 7 – Landscape Character and Visual:** The revised assessment includes updated Landscape Impact Assessment/Visual Impact Assessment tables and assessment plans in relation to:

- revised landscape strategy/mitigation description to positively address consultee concerns;
- Listed buildings;
- Green and Open spaces;
- Foot paths / pedestrian linkages;

- review of Lichfield District Council's viewpoints/setting of Lichfield and impact on 'The Lichfield Gap';
- greater retention of woodlands and hedgerows;
- review protection of setting/views from listed buildings, updated historic landscape character; and
- review description of extant landscape character.

1.4.10 **Chapter 8 – Hydrology and Water Quality:** This Chapter considers the following issues and addressed through the ES Update in line with agreed Environment Agency and County Council requirements:

- Surface Water Drainage & Flood Risk;
- Drainage Strategy for the development;
- A Foul Water Disposal Strategy; and
- Water Quality Review.

1.4.11 **Chapter 9 – Land Use, Geology and Soils:** This Chapter of the ES Update will review Geology in line with agreed Environment Agency requirements in respect of:

- Water Supply (Easements / Ground Water / Pollution Prevention)
- Hazardous Substances.
- Archaeological investigations / Contaminated land; and
- Minerals Sterilisation

1.4.12 **Chapter 10 – Cultural Heritage:** The scope of the cultural heritage chapter is to comment on the revised illustrative Masterplan and its effect on the settings of cultural heritage features and the historic landscape.

1.4.13 **Chapter 11 – Socio Economics:** This revised Chapter of the ES Update directly links the proposed settlement with existing employment bases and responds to the deficiencies in police, health and educational provision within the new settlement. The relationship of the proposed settlement to the existing employment location of Fradley Park is quantified further together with information on new employment opportunities generated through the development. It is considered not to be appropriate to identify further Use Class B employment sites in the settlement.

2. Application Site

2.1 Site Description

- 2.1.1 The original site description remains appropriate in terms of Curborough's strategic context; Burton lies some 15km to the north of the site off the A38 while the Birmingham conurbation is some 35 km to the south. The M42 is accessible at Tamworth some 23 km away while the M6 Toll Road is only 10 km distant. Links to the conurbation can be obtained by train from Trent Valley Station on the north east edge of Lichfield, only 4 km from the centre of the development area.
- 2.1.2 The centre of Curborough will be located some 7km to the north of the centre of Lichfield, located outside the Green Belt in the southern part of Staffordshire. It will be developed around the existing substantial employment area of Fradley Park, which is immediately to the west of the A38 (Trunk road) leading from Birmingham to Derby.
- 2.1.3 The Curborough new settlement is planned in the Fradley area north of Lichfield City to address the high level of housing demand identified in Staffordshire and the need to relieve the pressure on Lichfield City to conserve its historic character. The settlement will provide the opportunity to create a sustainable community with a wide range of housing and employment opportunities. Complementary recreational, community and local shopping facilities are also incorporated into the planned settlement in order to benefit existing and future residents.

2.2 New Settlement Application Site Area

- 2.2.1 The planning application site is based on an unchanged gross site area of approximately 283.9hectares, as indicated on Plan RPS1 (Figure 2.1 in Appendix A). The application site contains part of the old Fradley Airfield, RAF Lichfield. The remainder of the airfield has either been developed, is under construction or has planning permission for mixed business uses. Part of the site, however, is in agricultural use or is plantation woodland.
- 2.2.2 A larger area of woodland is to be retained whilst the historic pattern of hedgerows and field boundaries are incorporated and reflected in the revised layout, thereby reducing the extent of built development and slightly increasing the residential densities as a result to an average PPS3 net density of 39 dwellings per hectare.
- 2.2.3 In addition to the amendments within the application site, the amended Illustrative Masterplan submission and this ES Update addresses the concern of continued protection of the retained open land separating Lichfield City and the application site. This provides the means of preventing coalescence between the settlements in the future. Continued agricultural use of the separating land is proposed to be secured by way of policy designation through the Lichfield LDF The land identified by the blue line on Plan RPS1 (Figure 2.1 in Appendix A) is within the control of the applicant and therefore its use is sought to be controlled through the Lichfield LDF restricting the land's use to pasture land and hay meadow, which will ensure that a 'gap' of open character is maintained between the settlements.

3. Proposed Development

3.1 The Proposed Development

3.1.1 As detailed through this ES Update, whilst there are significant changes to the disposition of land uses within the application site, the principal issues of the planning application fundamentally remain the same and relate to a development of up to 5,000 dwellings, educational establishments, a Local Centre, community infrastructure including open space, highway access and waste recycling facilities. The detailed description of development below has been amended to take account of the revisions detailed through this ES Update:

*Construction of a new community comprising: up to 5,000 dwellings; 2 primary schools and secondary school (including dual use indoor and outdoor leisure facilities); a local centre including **use class D1 library; general practitioners/health centre facility; a place of worship, day nursery, police post facility; use class D2 community centre; use class B1 offices; use class A1 retail; use class A2 financial services; use class A3 restaurant; use class A4 public house; use class A5 take away uses; waste recycling facility; highways infrastructure including new Hilliard Cross A38 grade separated junction; a secondary access link onto Burton Road; a tertiary access link onto Watery Lane; a bus based park and ride east of the A38; new junctions with Wood End Lane and Gorse Lane and pedestrian/cycle network provision; Green infrastructure including public open space and allotments; equipped play areas; formal sports pitches; strategic landscaping and surface water balancing ponds; demolition of buildings and general infrastructure provision. **Bold sections indicate amendments.*****

3.1.2 The Illustrative Masterplan produced to inform the outline planning application and allow the adequate assessment of the development's impact, has been amended to take account of the varying provisions identified through consultation responses and subsequent discussions, highway access amendments and improved urban design arrangement (attached as Figure 3.1 in Appendix A). The key design changes that have occurred since the application submission document relate to:

3.1.3 Related figures are contained within Appendix A of this document.

3.1.4 The key design changes that have occurred since the application submission document relate to:

Development Blocks/ Density

- The development blocks of the settlement have been amended to reflect the historic field pattern much more closely, which includes the retention of more important hedgerows alongside streets.
- Average density has increased with the loss of development land.
- The Local Centre has been realigned, and the 'main high street' now runs north-south through it, also responding to the need to provide for the green space / parkland to the south of Wood End Lane. The Local Centre itself remains the same size as before.
- Housing parcels now 'back onto' school sites, to provide some enclosure and security for the schools.
- New squares are shown around 'pocket parks' with LEAPs.

Ecology

- The scope of ecological works proposed on land within the Applicants control; New habitat ponds have been added within the northern section of the settlement within an area of informal POS but not part of the active recreation area;
- Almost all important hedgerows are now shown as retained, with standoff zones to development.
- The width of the woodland buffer adjacent to the Trent and Mersey Canal has been widened to 35m, making this buffer more substantial in connecting Fradley Wood and Big Lyntus Wood, and removing the elongated 'nature conservation strip' from within the secondary school site, i.e. not within the school's control, rather as part of the canal side conservation area.
- The pond on Netherstowe Lane is to be retained.
- Additional small habitat pond shown to the north next to larger SUDS basin.
- Hay meadow and pasture provided in the Lichfield Gap.
- Locations of badger sets have been verified and 30metre no-build stand off applied throughout.

Landscape

- The southern edge of the development boundary to the south west has been pulled back to widen the 'Lichfield Gap'. This also has the advantage of enabling the creation of a much larger and elongated District Park to run all along the southern boundary whilst providing space for allotments and sports pitches within it.
- In response to a requirement to provide a much better green space between Little and Big Lyntus Woodlands has been provided as a woodland belt and pitches / formal open space running along the south side of Wood End Lane. This provides a centrally located 'town park' to satisfy the concerns about protection of the woodlands and hedgerows along Wood End Lane.
- Both the area of existing woodland to be retained, and proposed woodland have increased in response to Lichfield District Council's and Natural England's comments, with the removal of active open spaces from within the woodland.
- The Cathedral vista has been amended so that the vista has become more sinuous, whilst still reflecting the need for views to the cathedral spires.
- Woodland retention qualified at Fradley Wood.
- New footways shown connecting POS including a link through Fradley Wood to try to avoid random access by visitors.
- New woodland blocks / tree planting shown.
- Peripheral buffers re-illustrated.
- A 15metre standoff shown to virtually all proposed and retained woodland.
- A 5metre standoff to virtually all retained hedgerows.

- Proposed planting along the secondary and tertiary road links on the Illustrative Masterplan and Site Wide Illustrative Masterplan reflect the proposed Landscape Illustrative Masterplan design.
- More street trees, to respond to climate change issues.
- Revised landscape treatment illustrated for Park and Ride, including removal of linear woodland along southern boundary.

Open Space

- Smaller Local Equipped Areas for Play (LEAPs) in small parks have been moved to provide the optimum 240m walking distances to almost all the housing on the site. These also form small 'pocket parks' to neighbourhoods within residential areas to serve the community.
- The area for sports has increased to account for removal of the trim trail from 'other sports', in line with Sport England comments. This assumes 8ha 'outdoor sports pitches' provided as part of the extended secondary school site. The creation of four areas of outdoor sports pitches will now serve the entire site, whilst the area has increased slightly in response to Sport England comments.
- Pitches removed from previous education quarter and relocated to the proposed Town Park and opposite to the existing Tesco warehouse to the north. This has the advantage of making the best use of land as the pitches fall within the 45metre noise buffer offset, whilst providing a buffer to Tesco along its entire length.
- Public sports area extended to accommodate cricket pitch in Town Park and tennis court area as part of southern District Park, with indicative pitches shown.
- Three new 'Indicative Sports Changing Facilities' indicated for sports areas.
- Linear open spaces modified to accommodate revised cathedral vista and extended southern primary school.
- Area indicated for children's play has been increased within the Town Park, and for the two equipped areas to the south. This is to achieve the minimum 4.88 ha of open space identified as being required by Lichfield DC's calculations. There has been no further loss to developable area due to this change, only changes to both informal POS and area for sports.
- NEAP / LEAP to north shown in more detailed design. NEAP to south revised to accommodate larger school site, moved into the linear vista corridor hidden to some extent by hedgerows of Netherstowe Lane.
- Multi Use Games Area (MUGA) shown in Town Park.
- Allotments indicated as part of the larger District Park.
- Footways / cycleways more clearly shown and includes segregated footway / cycleway running along the hedge bank the other side of Gorse Lane within the site.
- Proposed new footway connection to exiting Darwin Walk to the south from the District Park.
- Footways / cycleways shown alongside secondary and tertiary links into site.

- Public sports area extended to accommodate cricket pitch in Town Park and tennis court area incorporated as part of southern District Park, with indicative pitches shown.

Highways

- Main loop road highway diverted to south along north of primary school to allow extension of school into linear POS, providing improved access to development land.
- Alignment of internal routes and part of key route slightly amended.
- Transport Interchange and weekend Market Space.
- Town Park car parking.
- Main Square shown as per more detailed design, with a vehicle access to education quarter.
- New squares shown around 'pocket parks' and the LEAPs.

Schools

- Schools extended to meet Staffordshire County Council site requirements; and
- Sports facilities / dual uses indicated / central building revised.
- The secondary school and primary school have been co-located to create an 'education quarter'.

Sustainable Urban Drainage Systems (SUDS)

- Potential 'SUDS route in street' leading directly north from Netherstowe Lane now shown.
- Drainage ponds to the south have been clarified.
- 250m cordon sanitaire (no build zone) around the Sewage Treatment plant is provided.

Facilities

- A Police Post will be provided for the settlement and located within the Local Centre to offer a central base for the local constabulary police officers to work from.
- Community Pavilion in the Town park;

Historic Environment

- Some development blocks revised to take account of historic hedgerows and field boundaries;
- Development edge adjacent to Curborough Farm pulled away from the Listed Building to protect its setting.

3.1.5 The principal component of the development however remains as a community of up to 5,000 houses comprising a mix of types and tenures. To ensure the proposals develop into a sustainable community, provision will be made for retail, education and open space provision appropriate to the number of houses and population of Curborough. **Table 3.1** 'Revised Land Use Budget' sets out the areas of land within the site allocated for the various uses that provides an indication of the previous and now proposed land areas for element of the development. The Total Site Area is 283.85ha; the table below rounds the areas to one decimal place.

Table 3.1 - Revised Land Use Budget

USE	CONTENT	Previously /Ha	Proposed /Ha	Change /Ha
RESIDENTIAL	Housing Area	118.6	108.8	- 9.8
LOCAL CENTRE	Retail / Commercial/ Community	9.6	8.3	- 1.3
EDUCATION/ INDOOR SPORTS	Secondary School (Includes 1.0ha indoor sport – swimming pool / sports hall – Dual Use).	8.6	10.1	+ 1.5
	2 Primary Schools (includes dual use of halls for indoor sports – badminton etc)	4.3	5.2	+ 1.0
PUBLIC OPEN SPACE	Children's Play Area	4.9	4.9	0
	Sports Pitches (outside secondary school)	11.7	13.2	+ 1.5
	District Park	11.0	14.3	+ 3.0
	Existing Woodland	24.8	25.3	+ 0.5
	Proposed Woodland	11.3	13.9	+ 2.6
	Other Informal spaces	33.3	31.5	- 1.8
INFRASTRUCTURE	Park & Ride	0.9	0.9	0
	Hilliard's Cross	21.0	21.0	0
	Secondary / Tertiary Link	22.4	21.9	- 0.5
	Fradley Park Link / Wood End Lane (outside Local Centre)	0.8	2.9	+ 2.1
	Other infrastructure (Main Square)	N/A	1.2	+ 1.2
OTHER	Gorse Farm	0.5	0.5	0
TOTAL LAND BUDGET		283.9	283.9	0

3.1.6 A key objective of the proposal is to meet sustainable development requirements in terms of the site's specific context, taking account of local constraints and opportunities which exist. The primary consideration is for Curborough to be centred on and around the former airfield, maximizing access to the existing and expanding employment area to create a sustainable, inclusive and mixed community. Related to this, the proposals seek to minimise the amount of

travel needed for residents in the new settlement and between it and Lichfield, as well as maximizing the potential for walking and cycling and use of enhanced public transport provision. Accordingly, the Illustrative Masterplan envisages Curborough as a compact form centrally focussed around a core Local Centre.

- 3.1.7 The Local Centre is a key feature to ensuring the sustainability of the settlement, providing public services, employment, business premises and retail facilities as follows:

Table 3.2 - Local Centre Area Breakdown

Use	Number of units	Unit Gross Floor Area /sqm	Parking Requirement/ spaces	Site Area at Ground Floor/sqm	Residential above
Supermarket	1	2500	113	5777	Y
Retail Units	10	120	64	3056	Y
Financial Services	3	500	105	4545	Y
Restaurant	1	500	148	4792	Y
Public house	1	500	148	4792	N
Take Away	3	120	1	389	Y
Offices	12	500	105	9045	Y
GP Practice / Health Centre	1	300	102	3258	N
Library	1	450	77	2683	N
Nursery	1	600	102	3558	N
Place of Worship	1	350	60	2090	N
Police Post	1	120	1	149	Y
Community Centre (2 storey)	1	600	102	3258	N
Waste Recycling Facility	1	100	0	100	N
Residential	600	84	661	25441	Y

- 3.1.8 The proposed Illustrative Masterplan demonstrates how the Local Centre will provide a mix of uses at ground floor with residential apartment units above where appropriate, resulting in an average building height of approximately 2.5 storeys but providing focal buildings of three to five storeys. The residential units to be provided also include live/work units so that sustainable methods of working are embraced within the Local Centre. The business premises provided as offices or for financial services are relatively small, providing accommodations for small independent businesses, starter units and to avoid the proliferation of financial services within the prime retail area. The floor area schedule illustrated by **Table 3.2** is illustrative only based upon anticipated uses, but helps to identify the proportion of uses within the Local Centre.

- 3.1.9 Curborough adjoins the regionally significant employment location of Fradley Park and will provide a new residential community on the Lichfield side. The programme and profile for the residential

community is not however, dependent upon the full implementation of the adjoining employment site. The residential community has been master planned in a way which physically connects with Fradley Park and ensures the two areas are integrated in a holistic and mutually beneficial manner. To improve connectivity with Lichfield and enhance the proposals overall sustainability, local secondary and tertiary access connections form part of the Illustrative Master planning through the southern part of the site. However, a key consideration for the scheme in this southern section has been to provide a buffer of open land between the new settlement and Lichfield, to avoid any possibility of coalescence and preserve the identities of the two areas.

3.2 Key Principles and Objectives

3.2.1 Key principles for Curborough are as previously provided with a few updates as detailed below:

Development Character

3.2.2 The proposal provides a development of varied character maintaining a high quality environment throughout the proposal. As the Illustrative Masterplan indicates, a series of land parcels has been identified and interpreted through variations in landscape, layout, built form and land use mix. The overall Illustrative Masterplan principles have ensured a thorough assessment of the site and surroundings, whilst producing a development character of distinctive design. The development incorporates visual connectivity and important views, such as those towards Lichfield Cathedral.

3.2.3 The Amended Illustrative Masterplan includes three tiers of development area, which respond to changes in development scale as follows:

- (i) The entire development area which has a cohesive character, with elements that 'tie' it together and create a unique 'place' focusing on a local centre around which the development pivots and includes mixed uses at its core to serve the new community.
- (ii) Four development 'quarters' which comprise:
 - (a) Two large 'residential' quarters' north and south of Wood End Lane, centred around a large green space that includes a Neighbourhood Equipped Area for Play (NEAP). Each of these two large residential quarters has a centrally located primary school serving it;
 - (b) The mixed use Local Centre which forms a commercial / mixed use quarter at the centre of the development; with residential uses above the ground floor.
 - (c) The secondary school with its large area of dual use pitches, located alongside sports pitch provision with the northern primary school connected to these pitches. The secondary school is also located adjacent to the mixed use centre bringing this key community use into the heart of the scheme;
- (iii) Seven 'neighbourhoods' each orientated around a central community space and play area.

Green Infrastructure

- 3.2.4 The proposal will protect existing natural features of significance and enhance and extend the natural landscape setting and ecological value of the development. As indicated on the Illustrative Masterplan, green infrastructure provision forms a major component of the proposal, including the provision of a district park, linear parkways, green pathways throughout the site and retention of existing woodland. The development will be provided as a sequence of residential communities set within a network of green routes following existing hedgerow features on the site.

4. Alternative Sites and Options

4.1 Introduction

- 4.1.1 The Town and Country Planning (Environmental Impact Assessment) Regulations 1999 require that a review of the alternatives to the proposed development be undertaken. The ES, therefore, examined what alternative sites and development solutions may exist to meet the housing needs of Lichfield District Council up to 2026.
- 4.1.2 In order to demonstrate the appropriateness of Curborough in relation to the delivery of housing, the ES examined the possible alternatives through an assessment of the following factors, as agreed with Lichfield District Council, through the initial ES Scoping Report:
- i Evidence Base – reviews the previous strategic spatial options that have been taken into consideration through the RSS and Development Plan;
 - ii Alternative Studies – Based upon the Core Strategy Issues and Options; and
 - iii Alternative Sites – This assesses specific alternative sites provided by Lichfield District Council as sourced through the consultation process for the LDF Site Allocations document, having regard to appropriate spatial considerations.
- 4.1.3 A number of consultations received in response to the planning application have suggested there are deficiencies in the consideration of alternative sites and development options due to the alleged restricted scope of the assessment. Advantage West Midlands' response of 8 May 2008 illustrates this by referring to the settlement proposed as "only one of several approaches to achieving required housing growth for Lichfield". The West Midlands Regional Assembly's (WMRA) response of 9 May 2008 considered that the provision of a new settlement would have restricted benefits to the wider rural context of the District, whilst having no endorsement from the RSS Preferred Option. The WMRA also argued that the provision of housing through a new settlement could not be justified as long as sufficient urban brownfield sites were available within the plan period.
- 4.1.4 In response, while it is recognised that other options can be identified to meeting housing growth requirements in the District, these would be dependent upon significant use of statutory Green Belt or dispersal of development at an unsustainable scale to rural settlements remote from services and employment opportunities. It is evident that there are not sufficient urban brownfield sites to accommodate the current level of housing proposed in the RSS Preferred Option in Lichfield District. The evidence base that has been prepared so far for the Lichfield Core Strategy confirms that, without the Curborough settlement, Green Belt release will be necessary to accommodate the WMRA's proposals.
- 4.1.5 The WMRA response relies on reference to Policies in the 2004 RPG11 version of the RSS which contains a policy approach of maxima housing figures for county areas and no district distribution. The housing requirements in the Staffordshire Policy Area in that document were based on now seriously out of date housing requirements. The scale of housing proposed in the new settlement does not preclude an appropriate response to rural settlements in the area in terms of meeting genuinely assessed local housing needs. While the 2004 RSS does not include a policy for new settlements, it does describe its strategy as meeting local need where it arises at District level beyond the MUAs. The assessment of need in the Lichfield District area up to 2026 is of a scale sufficient to justify consideration of a new settlement at Curborough/Fradley which was found to

be the most appropriate and sustainable means of meeting housing growth requirements in the area through the last sub-regional strategic development plan for this area. The WMRA response fails to recognise the dependence of the area to a great extent on employment opportunities existing and proposed at Fradley Park adjacent to the site.

4.1.6 The Government Office for the West Midlands is mindful of advice from the National Housing and Planning Advisory Unit (NHPAU) that the RSS Preferred Option significantly under-provides for housing growth in the Region up to 2026 to the extent of some 80,000 dwellings. National Planning Policy in PPS3 requires such additional development to be directed to the most sustainable locations.

4.1.7 In order to address the criticisms advanced to the principle of a new settlement as a means of addressing the housing need in favour of other options; this Chapter refers to the responses to spatial options consulted on by Lichfield District Council through the current Core Strategy process.

4.1.8 Related figures are contained within Appendix A of this document.

4.2 Lichfield District Core Strategy

4.2.1 Since the submission of the ES, Lichfield District Council has published the responses received to the Core Strategy Issues and Options consultation. From the 2,800 responses received it was identified that the most important issues were meeting the strategic housing requirement; identifying sufficient employment sites for allocation; the provision of affordable housing and tackling climate change through development. The settlement proposed seeks to address these important issues through the delivery of a residential development that will not reduce the current level of employment sites in the District.

4.2.2 Of the four spatial options that have been presented:

- Option 1 – Town Focused Development was the least popular whilst;
- Option 4 – New Settlement was the most popular with 40% of respondents supporting that alternative.
- In conjunction, a majority of 44% of responses supported Fradley as a location for a new settlement.
- Spatial Option 3 – Dispersed development within rural settlements was the second most preferred option, although this option also received some negative comments with over one-third of respondents objecting to further development in any rural settlement due to their poor sustainability, insufficient infrastructure and high Greenfield land intake.
- Existing infrastructure was considered to be an important factor in deciding which rural settlements were suitable for development whilst the Fradley area was the most suggested specific location, supported due to its employment opportunities and highway network linkages.

- 4.2.3 This evident support for the use of a comprehensively planned new settlement to meet the housing needs of Lichfield City and the wider District reflects the assessment of the Spatial Options carried out through the ES. It is through this assessment and the formation of the four options by Lichfield DC that alternative forms of development have been taken into consideration and duly assessed.
- 4.2.4 The ES is not intended to consider other potential forms of development or combination of scenarios and it is accepted that the settlement as proposed is not the only option for meeting the District and wider region's housing demand.
- 4.2.5 However, given that the application has been submitted prior to the publication of the Core Strategy Preferred Option, it is not restricted by the parameters of Option 4 and therefore the provision of housing within key rural settlements and the redevelopment of appropriate windfall urban brownfield sites remains feasible. Rather, the development of Curborough will help to protect the historic context and open spaces of Lichfield whilst preventing intrusions into the Green Belt and further development within far less sustainable locations. In addition to this, the housing needs of neighbouring authorities such as Tamworth and Cannock Chase remain to be considered through the RSS Revision and Core Strategies where the impact of cross boundary provision will be appropriately assessed. The options for cross boundary housing provision are not hindered by the Curborough proposal, so in the long-term the Rugeley Power Station site could still be redeveloped as well as areas on the periphery of Tamworth. The cross boundary provision of housing supply will require a strategic guide through the RSS.
- 4.2.6 In respect of the development of the District's urban brownfield sites in preference to a new settlement, the probability of achieving the redevelopment of heavily contaminated sites with material conflicts such as access constraints and ownership issues is reduced given recent market conditions. The projected delay in developing sites with additional costs for residential use could also mean that these sites are instead utilised for employment, retail or leisure development, industries less affected by the recent financial downturn. This, therefore, has the potential to reduce the 'stock' of residential sites available and the sites that will actually be built out even though planning permission has been granted.

4.3 Suitability & Sustainability

- 4.3.1 The appropriateness of the application site as a location for a new settlement has been criticised by some through consultation responses due to its relationship with Lichfield City and the potential of coalescence it poses as well as its 'rural' context, the lack of a railway station and claimed overall sustainability weaknesses. These criticisms are not well founded as the Council's Draft Strategic Housing Land Availability Assessment (SHLAA) and Rural Settlement Sustainability Study 2008 (RSSS) demonstrate.
- 4.3.2 The majority of the application site was considered through the SHLAA, which is intended to identify potential housing sites in Lichfield District. It is intended to inform the Core Strategy DPD and subsequent Allocations of Land DPD. The site of the proposed settlement was identified through this document as 'Site 42: Fradley New Settlement' (Figure 4.1 in Appendix A), where it was assessed as "Not Currently Developable" due to the site not being within the planning process, not deemed to be suitable in comparison with the housing levels to be provided, a number of minor policy constraints existed and physical problems were identified in relation to flood risk.
- 4.3.3 Of the Policy restrictions identified, deleted policies have been sourced but no reference has been made to the Mineral Consultation Area designation of the site through the Minerals Local Plan. The disregard of the local minerals policy designation may be an indication of the diluted purpose of this particular designation and that it would not preclude development. The site was also noted

to fall outside of a settlement boundary but due to the level of proposed services and facilities, it was considered to be able to contribute to a sustainable mixed community.

- 4.3.4 The site is however now in the planning process. The physical constraints of flooding have been taken into consideration and mitigated against effectively. The phasing strategy and delivery mechanisms provided through this application demonstrate that the settlement is achievable and suitable. Taking these factors into account, and the studies of this ES, the only potential constraining factor that potentially remains to prevent the settlement proposal from being brought forward is the strategic level of housing to be accommodated in the Region and its distribution at District level. This ultimately is a matter of phasing, which can be regulated by planning condition if necessary.

4.4 West Midlands RSS

- 4.4.1 The RSS Revision Phase 2 (Preferred Option) states that the scale of projected housing need is now such that large parts of the West Midlands MUAs do not have the land capacity to accommodate the necessary building without making in roads into Greenfield or Green Belt land through urban extensions. Consequently, while focusing attention on efforts to increase the attractiveness of the MUAs so that they can retain population, some settlements and local authorities in the surrounding Shires have been anticipated to provide housing beyond their own generated needs in order to meet this shortfall. Such provision is sought in ways that promote local sustainability and a greater degree of self sufficiency and that complements rather than detracts from the urban renaissance programmes within the MUA. Lichfield can be seen to be a location that has consistently provided housing beyond its own needs as a result of migration and the relationships to neighbouring authorities such as Cannock Chase and Tamworth.
- 4.4.2 There is evidence that the RSS Revision Phase 2 (Preferred Option) has not accurately assessed the housing needs of the Region overall and within districts and sub-regions in accordance with NHPAU advice.
- 4.4.3 Although the current RSS (Regional Planning Guidance 11) as published in June 2004 adopted a policy direction which identified that areas beyond the MUAs were no longer intended to provide for the short-fall in housing provision, development in the form of "sustainable settlements" (para 3.5) within Staffordshire was still considered to be necessary to contribute to meeting the Region's housing requirements. Crucially, the delivery of the Spatial Strategy and the growth aspirations of the Region require significant and concerted investment in new infrastructure and the improvement of existing facilities. The settlement as proposed within the sub-regional housing market area of Lichfield is considered to have the potential to fulfill these requirements and although not providing a wide distribution of housing across the District, will provide a housing resource alongside much required infrastructure and community facilities, which is considered to be in accordance with the policy direction of the RSS revision.
- 4.4.4 A report has been produced in October 2008 by Independent Planning Consultants Nathaniel Lichfield and Partners (NLP) on behalf of the Government Office for the West Midlands that examines, assesses and seeks to identify the potential capacity for additional housing numbers in the West Midlands. The NLP study will now be part of the evidence supplied to the RSS Examination in Public process due to take place in spring 2009. It is a source of evidence about scope, impact and implications of delivering additional housing. The report concludes that it is possible to deliver higher levels of housing without undermining the urban renaissance strategy for the region. In the report NLP have identified three potential spatial scenarios that could deliver additional housing. These scenarios are not definitive proposals or alternative strategies for the region; they merely represent an independent assessment of where additional housing could be accommodated. Scenarios are not site specific rather they assess the potential for additional growth to be accommodated in Local Authority areas. The broad based locations identified are not exhaustive.

- 4.4.5 The NLP report provides an assessment of a new settlement at different scales at Curborough. It identifies capacity issues on the A38 as a constraint. This issue is addressed in the Transport Assessment accompanying the planning application.

4.5 Lichfield Housing Land Supply

- 4.5.1 Analysis undertaken by Lichfield District Council entitled 'Assessment of 5 year housing land supply (July 2008)' of housing delivery requirements in comparison to Lichfield's housing land supply seeks to demonstrate that it can fulfil and exceed the five year requirement based on the RSS Preferred Options document. This compares with a 4.9 years housing land supply in 2006/2007. The principal reason for this increase in supply is identified as a sharp increase in completions in the last year (2007/2008) of 569 dwellings compared to 304 completions in the previous year. It additionally has assumed a forward supply of 727 dwellings identified through the recent (April 2008) Strategic Housing Land Availability Assessment (SHLAA) process. Although these sites do not have planning permission or allocations, the SHLAA work has assessed them as being deliverable within the next five years and therefore contributing towards the five year requirement.
- 4.5.2 Whilst the methodology used by LDC (in the draft SHLAA) for assessing its 5 year supply is not necessarily agreed by the Curborough Consortium, analysis demonstrates that no new housing allocations have been identified at present to meet future requirements. Lichfield District Council is currently completing its SHLAA. The purpose of the SHLAA document is to provide a more robust indication of potentially suitable and available housing sites within the District up to 2026, to be delivered through Lichfield's Core Strategy and Allocations DPDs. In the short term, given the supply of sites with permission, cumulative completions over the next few years are likely to be sufficient to deliver Lichfield's current housing requirements. However, beyond 2012 housing completions are expected to fall off, with the District likely to be reliant upon small windfalls only (sites of less than 10 dwellings) which will be insufficient to meet projected future requirements. This point is confirmed in the draft April 2008 SHLAA report, which assesses the deliverable housing sites against the 4 Spatial Options in the emerging Core Strategy:
- "For each option enough sites are identified that would meet the requirement for the first 5 years of the plan. However, the Assessment has not identified enough sites to meet the target for years 5-15."***
- 4.5.3 Even taking account of the optimistic and unchallenged methodology of the draft SHLAA for considering its 5 year land supply, there will be insufficient new housing allocations coming through the Development Plan route in approximately five years time which indicates a 'drying up of supply'. Whilst the remaining bank of permissions are likely to be built out over the next few years, it is clear that unless the District Council approves additional large windfall housing sites, Lichfield DC will be unable to maintain a five year supply of housing sites, contrary to the advice in PPS3.
- 4.5.4 The Curborough settlement continues to represent a highly sustainable option for meeting the strategic housing needs of the District and Sub-region without causing unacceptable harm to the character or landscape setting of Lichfield City. It avoids encroachment into the designated Green Belt around the principal settlements in the District and unsustainable dispersal of strategic growth to rural settlements.

5. Planning Policy

5.1 Introduction

- 5.1.1 As this ES Update is intended to assess the significance of environmental impacts of the development proposed, the interpretation of policy is not considered to be a matter for inclusion in this document and will therefore be dealt with separately. The consideration of mineral extraction on the site is however a matter to be considered due to the extensive environmental implications such works would have.
- 5.1.2 From the consultation responses received to date a policy objection has been raised in relation to the proposal's contended conflict with saved Structure Plan Policy MW4 – Conservation of Mineral resources. Chapter 12 of the ES Update demonstrates that the minerals that can be economically extracted are capable of being worked in parallel with phased development of the settlement. Further, the viable minerals can be used sustainably for the development. The proposals are therefore contended to conform with identified Structure Plan Policy MW4.
- 5.1.3 This section provides a brief commentary on Minerals policy and refers to other policy comments made by consultees on the application.

5.2 Regional Spatial Strategy

- 5.2.1 The regional policy that the proposed settlement has been assessed against through this ES Update the emerging RSS Revision Phase 2 'Preferred Option' December 2007, which will be subject to the Examination in Public in April to June 2009.
- 5.2.2 Policy M1 of the RSS relates to the supply and working of non-energy minerals such as sand and gravel. This policy requires that suitable levels of supply are identified within the West Midlands for a minimum of 10 years whilst taking into account local considerations and policy restrictions. The identification of possible areas of supply through land banks is intended to safeguard the opportunity of mineral extraction in future years and to prevent resources from being permanently sterilised by development. The Staffordshire Minerals Core Strategy is in preparation and seeks to identify the required level of mineral provision in accordance with the Regional requirement without considering the application site as a potential minerals extraction site.

5.3 Staffordshire and Stoke-on-Trent Minerals Local Plan

- 5.3.1 The Minerals Local Plan was adopted in December 1999 with various policies saved for use beyond September 2007. However, Policy ML4 in respect of Safeguarding Mineral Sites was not saved. The County Council did not seek to retain Policy ML4 as more recent guidance was provided through Mineral Policy Statement 1 in regard to the importance of safeguarding identified minerals. Policy ML5 was saved and refers to the identification of Mineral Consultation Areas (MCA) where development is assessed in relation to the risk posed of sterilising mineral resources. This policy simply fulfils an identification purpose in regard to Development Control considerations and can not be replaced by national guidance. The development site is identified by the County's MCA Plan at Figure 5.1 (in Appendix A) as being located within a MCA due to aggregate reserves in the locality. However, the MCA designation covers an extensive area beyond that indicated by **Figure 5.1**, (in Appendix A) indicating that the District and wider County area could have substantial mineral resources. The proposed loss of a small proportion of this potential resource is not considered to detrimentally affect the ability of mineral resources to be identified in the future to fulfil the regional requirements. The precise geology of the site and the extent of sand and gravel resources are detailed within Chapter 12 of this ES Update.

5.3.2 As addressed in greater detail in the Land Use and Geology Section of this ES Update, sand and gravel mineral deposits have been identified within the site and confirmed in three positions to be between 5m and 9m below existing ground level. All land to the north of Wood End Lane and to the east and west of the A38 which is identified for development would be sterilised for future mineral extraction following development. The proposed loss of a small proportion of this potential resource is not considered to have a detrimental effect on the ability of mineral resources to be identified in the future to fulfil the regional requirements.

- Sand and gravel mineral deposits have been identified within the site and confirmed in three positions to be between 5m and 9m below existing ground level. All land to the north of Wood End Lane and to the east and west of the A38 which is identified for development would be sterilised for future mineral extraction as a result of the development. Based on a technical assessment, it is concluded that extraction of the sand and gravel south of Wood End Lane will not be commercially viable.
- North of Wood End Lane, there are limited sand and gravel deposits that can be economically extracted within the phase 2 area of the proposed development. The material can be extracted in parallel with the implementation of Phase 1 of the development with the materials being used on site. This represents a sustainable means of sourcing required building materials which minimises bulk transport on the road network.

5.3.3 The allocation of approximately 50% of the application site within a MCA is not intended to prohibit development, but instead operates as an alert system to the County and District authorities that requires developers to demonstrate that extraction of the mineral resources is impracticable and financially unfeasible. It is noted that this mineral resource has not been protected from non-mineral development through a Mineral Safeguard Area Allocation which applies a stricter restriction.

5.3.4 The minerals report by David L Walker (Appendix E) is summarised more fully in Chapter 12 on Land Use, Geology and Soils.

5.4 Lichfield Local Plan

5.4.1 Part of the northern area of the site was designated through the Local Plan for recreational purposes by Policy EA12: Fradley Recreation Zones, intended to serve the adjacent business Park and Employment Area as well as South Fradley. This allocation was intended to ensure the restoration of Fradley Wood whilst providing a range of indoor and outdoor leisure facilities. Despite consultation comments referring to it, this policy was not 'saved' for future use and given the lack of leisure facilities that have been delivered alongside the development of the Fradley Park employment site and South Fradley residential area, it is unlikely that any recreational allocation will be proposed in the future.

5.4.2 Extensive recreational and indoor/outdoor leisure facilities are proposed within the settlement that are considered to be more than adequate to serve the needs of the settlement, Fradley Park employment area and South Fradley. Taking this into account, the proposal cannot be considered to be contrary to an unsaved policy which has no bearing upon the determination of this proposal.

6. Ecology and Nature Conservation

6.1 Introduction

- 6.1.1 This update complements information already submitted as part of the ES chapter in March 2008, and should be read in conjunction with that document.
- 6.1.2 The ES chapter of March 2008 assessed the ecology and nature conservation impacts associated with the proposed development of Curborough New Settlement, near Lichfield in Staffordshire (centred on OS Grid Ref: SK 132 128).
- 6.1.3 Related figures and illustrations are contained within Appendix B of this document.

6.2 Reasons for the Update

Changes to alignment of the Access Roads

- 6.2.1 Due to the location and alignment of the secondary and tertiary access roads and bus based "Park and Ride" not being identified until later in the pre-application process, it was not possible to undertake all seasonal surveys on time. The survey window for 2008 was therefore used to undertake these and any additional surveys required (e.g. badger bait-marking studies and invertebrate survey) Mitigation proposals have therefore been outlined for these species/ groups of species, where appropriate.

Consultation with statutory consultees

- 6.2.2 Detailed consultation was undertaken with the statutory consultees for ecology and nature conservation, including Natural England and the local planning authority, following the production of the ES Chapter. Initial comments on the ES chapter by the statutory consultees revealed the need for revisions to the masterplan and a number of additional surveys to be undertaken. It was felt by some of the consultees that national (PPS9) and regional (West Midlands Regional Spatial Strategy) policy was not fully met by the ES Chapter. It was also suggested that Staffordshire Biodiversity Action Plan and NERC Act 2006 Section 41 species were not sufficiently covered by the ES chapter.
- 6.2.3 Ongoing consultation has been maintained in order to meet the needs of the consultees. An initial meeting was arranged where Natural England and Staffordshire County Council representatives discussed their concerns. The masterplan was then revised to accommodate the needs of the consultees, and a further meeting then took place to present this revision. An on-site meeting then took place, with representatives from the LPA, Staffordshire Wildlife Trust, RPS (ecology) and the Cooper Partnership (landscape) present. Since then, ongoing consultation via email has continued to inform this Update.
- 6.2.4 The survey window for 2008 has also been used to undertake any additional surveys requested by the consultees (e.g. badger bait-marking studies and invertebrate survey), and mitigation proposals have been outlined for these species/groups of species, where appropriate.

To update the ecological baseline

- 6.2.5 The opportunity to update the ecological baseline was taken, with additional record requests made to Staffordshire Ecological Records in August 2008. These updated results have been added to the desk study completed in 2007 for the ES Chapter.

To inform mitigation

- 6.2.6 Mitigation will be required for a range of species, for which a number of additional surveys have been undertaken in 2008. Species/groups of species such as bats, badger, otter and water vole can colonise new habitats relatively quickly. Therefore the survey window of 2008 was utilised to undertake these additional surveys, and suitably inform mitigation.

Changes to the masterplan and detailed design plans

- 6.2.7 Changes to the masterplan have resulted in the requirement to re-assess the impact on the ecological resource. Detailed design plans produced after the submission of the ES chapter also identified a number of trees with bat potential that will be felled. Additional surveys have therefore been undertaken on all these trees to look for evidence of bat roosts.

6.3 The Study Area

- 6.3.1 The following parcels of land have been described in the text:

- the main body of site;
- the Park & Ride facility alongside the Coventry Canal east of Hilliards Cross Junction on the A38 and the improved grade separated interchange at Hilliards Cross;
- the proposed secondary road link to the southwest of the site, and
- the proposed tertiary road link to the west of the site

6.4 Methodology

Relevant Guidance

- 6.4.1 All assessments undertaken for this additional document are based on the relevant guidance on ecological impact assessment as outlined by the Institute of Ecology and Environmental Management (IEEM) (2006) and the Institute of Environmental Assessment (IEA) (1995).
- 6.4.2 A number of the original Technical Appendices have been updated since the submission of the ES Chapter in March 2008. These have been included in the Technical Appendices to this document. In order to distinguish these reports from the original submissions these reports have a suffix b attached. For example, the updated Phase I survey report is referred to as 9.1 within Appendix B.1. The exception to this is the invertebrate report, which is new.

Updated Desk Study

- 6.4.3 An updated desk study was undertaken in August 2008, to fully inform the ecological baseline. The additional records are presented in Appendix B and the revised Phase I habitat survey 9.1 (Appendix B)

Ecological Survey Methodology

- 6.4.4 RPS undertook additional ecological surveys on all land areas between April-September 2008. All these surveys follow best practice guidelines available at the time of survey. Details of these are provided in the relevant survey methodologies below.

Fieldwork

Extended Phase I Habitat Survey

- 6.4.5 An extended Phase I habitat survey was undertaken on all land areas within the red-line boundary in 2007. Additional surveys in 2008 concentrated on the additional land areas, and any minor changes to the red-line boundary.

- 6.4.6 The survey methodology followed guidelines supplied by the Joint Nature Conservation Committee (JNCC 2003) and the IEA (1995). The survey identified habitat types and species present within the site at the time of survey and assessed the potential of the habitats and features present to support other protected or notable species. Target notes were used to highlight and describe any feature of nature conservation importance or interest.
- 6.4.7 A revised map and detailed target notes have been submitted here, and can be found in 9.1 (Appendix B).

2008 Additional surveys

- 6.4.8 Additional surveys have been undertaken during 2008 for the following species/ groups of species:
- badger (to include a full bait-marking study);
 - great crested newt (GCN);
 - bats (to include emergence, dawn swarming and bat activity surveys);
 - water vole;
 - otter;
 - breeding birds;
 - barn owl;
 - hedgerows, and:
 - invertebrates
- 6.4.9 Detailed methodologies and results for all ecological surveys undertaken are provided within Appendix B: 9.1; B.26: 9.9; B.27: 9.10.

Badger Surveys

- 6.4.10 The survey methodology for all badger surveys followed the guidance of Neal & Cheeseman (1996) and Sargent & Morris (2003). During the surveys all woodland, hedgerows, paths and other linear features within the survey area were walked to locate badger setts, badger paths, latrine sites and dung pits. Areas with the potential to contain badger setts were also searched, such as woodlands and ditch banks. Badger paths were identified through the observation of field signs such as footprints, badger hair on barbed wire or vegetation and dung pits.
- 6.4.11 Updated badger surveys were undertaken in 2008, to include the additional land areas. The main site was also re-surveyed during this time. Confirmed badger setts were broadly classified into four main types: main, annexe, subsidiary and outlier, in accordance with Harris *et al* (1989) and the level of current use assessed. In order to confirm the territory sizes and distribution of the various badger clans, bait-marking studies were undertaken in September 2008. Survey methodology for the bait-marking studies followed Delahay *et al* (2000).

Great Crested Newt Surveys

- 6.4.12 The standard survey methodology for identifying presence / likely absence of great crested newt (GCN) and / or evaluating the population size is that published by English Nature (now Natural England) in the Great Crested Newt Mitigation Guidelines (2001).
- 6.4.13 The likely presence of Great Crested Newts (GCN) in ponds can be predicted by examining aquatic habitat features such as the presence of fish, waterfowl and water quality. For ponds these data are used to calculate a habitat suitability index (HSI; after Oldham *et al* 2000). The HSI is represented by a number from 0 to 1; the higher the number the more likely the pond is to be occupied by GCN. Oldham *et al* suggest that ponds scoring below 0.5 are extremely unlikely to contain GCN and can therefore be discounted from further study.
- 6.4.14 All ponds within the application site and up to 500 metres surrounding the site (a total of 52 ponds) were assessed using the HIS technique. Ponds that scored above 0.5 were then surveyed for presence/absence of GCN. Ponds that scored below the threshold were scoped out. The results of the HSI index and a brief description of all the ponds can be found in Appendix B of the GCN survey.
- 6.4.15 Nine ponds were surveyed for GCN by RPS in May 2007. An additional five ponds (all outside the application area, but within 500 metres) were surveyed by FPCR Ecology in 2007, the results of which were mistakenly reported as containing no GCN within the ES Chapter. The revised results are presented here. Three ponds within, or adjacent to, the new land parcels were surveyed in April-May 2008.

Bat Surveys

- 6.4.16 A comprehensive suite of additional surveys for bats were undertaken in 2008. The methodology for all surveys followed that recommended by the Bat Conservation Trust (2007), The Bat Workers Manual (JNCC 2005), and Natural England's Bat Mitigation Guidelines (2004). All surveys were organised and led by a Natural England licensed bat worker.
- 6.4.17 These surveys can broadly be divided into building assessments (external/internal surveys and emergence/dawn swarms), tree assessments (ladder inspections and dawn swarms), and bat activity surveys (walked transects). The additional surveys were undertaken between May-August 2008. For detailed survey methodologies see 9.4b (within Appendix B). The following represents a brief summary of the surveys undertaken:

Assessment of Buildings for Bat Roost Potential

External Assessments of Buildings

- 6.4.18 All buildings were surveyed externally for their potential to support roosting bats. Binoculars were used to search for potential access points for bats into crevices (e.g. under loose or missing tiles, holes under window sills and barge boards) and roof voids (e.g. under tiles, flashings, eaves and gable ends). All potential access points were inspected for evidence of use by bats, such as staining around holes, feeding remains, droppings and an absence of cobwebs.
- 6.4.19 The following buildings were assessed:
- Gorse Farm;
 - Gorse Lane 'Spinney' Bungalow;
 - Netherstowe Lane Bungalow;
 - 'Park & Ride' Bungalow;
 - All munitions stores and other derelict structures within Fradley Wood;
 - Pill-box structures outside of Fradley Wood, and:
 - All former aircraft hangars and surrounding structures.

Internal assessments of buildings

- 6.4.20 An internal roof void inspection was undertaken on Gorse Farm. The roof void was searched, looking for evidence of roosting bats (droppings, dead bats etc).

Emergence/dawn swarming surveys of buildings

- 6.4.21 Emergence/dawn swarming surveys were undertaken on the following building:

Gorse Farm

Dawn Swarming surveys of trees with high potential for roosting bats

- 6.4.22 All the trees within the application area were scored in 2007/8 as having negligible, low, medium or high potential for use by roosting bats. All trees with high potential for roosting bats were subsequently subjected to detailed external inspections using endoscopes and / or dawn swarming surveys.

Bat activity surveys

- 6.4.23 As a follow-up to surveys undertaken in 2007, ten bat activity surveys were undertaken in 2008, with ecologists walking pre-determined transect routes to maximise coverage of the site. Each route followed hedgerows and other field boundaries, or encompassed woodland edges that could potentially be used by foraging and commuting bats. The species (where detectable), location, time and direction of bats seen or heard flying over, were recorded. The surveyors regularly made sweeps from high to lower frequencies on the detectors to maximise the range of species detectable.

Water vole surveys

- 6.4.24 The methodology for surveying water voles used followed the updated guidelines of Strachan (2006). The surveys involved the systematic searching of all watercourses for evidence of water vole, such as entrance holes, droppings (latrines), and feeding piles. All watercourses within, and adjacent to the application site were surveyed in 2007, and resurveyed in May 2008, i.e:

- Curborough Brook;
- Mare Brook;
- 'Business' Brook;
- The Coventry Canal, and:
- The Trent & Mersey Canal.

Otter surveys

- 6.4.25 Otters were surveyed following the guidelines of the Environment Agency (1999). Suitable riparian habitat within the site boundary was searched for evidence of otter. Evidence included spraints, footprints, feeding remains and slides down river banks. The initial otter surveys were undertaken in May and August 2007, and covered all the water courses described above for water voles. Updated surveys were undertaken in May 2008.

Breeding bird surveys

- 6.4.26 Breeding birds were assessed using the methodology outlined by the British Trust for Ornithology (BTO) for the Breeding Bird Survey scheme. The method involves one initial visit the aim of which is to set up a transect route. This is followed by an additional two survey visits; one early in the survey season (March-April), followed by a late survey visit in May-June.
- 6.4.27 A breeding bird survey of the main body of the site was undertaken in April-May 2007. This was updated with a single survey visit to the whole site in April 2008. Full breeding bird surveys were undertaken on all the additional land parcels in April-May 2008.
- 6.4.28 The 2008 results are presented in 9.6b, 9.6a-f (within Appendix B).
- 6.4.29 Figures 9.6a – 9.6f (within Appendix B) show the approximate locations of all designated species territories recorded during the surveys.

Wintering bird surveys

- 6.4.30 No additional surveys for wintering birds have been undertaken since the ES submission. However, for the purposes of presentation, the results of these surveys have been separated out from the breeding bird surveys, and can be found in Figure 9.7 (in Appendix B).

Barn owl

- 6.4.31 A barn owl survey for the whole site was undertaken in 2008 using the methodology outlined by the British Trust for Ornithology (BTO). As a follow up to the habitat appraisal undertaken in 2007, two survey visits were made to the site. In addition, all the buildings on-site were re-inspected in May 2008 for evidence of nesting barn owls. The 2008 results are presented in 9.6b (within Appendix B).

Invertebrates

- 6.4.32 A general habitat appraisal of the site for invertebrates was undertaken in September 2008 by an experienced entomologist. In addition, detailed invertebrate surveys of Fradley Wood and other targeted areas of the site were undertaken during this time. Surveys concentrated on UK and Staffordshire Biodiversity Action Plan (BAP) species, and NERC Section 41 species. The results are presented in Figure 9.9 (in Appendix B).

Hedgerows

- 6.4.33 All hedgerows were surveyed following the methodology outlined in the Hedgerow Survey Handbook (DEFRA, 2007). The hedgerow surveys were updated in 2008, using a combination of field visits and historical maps, such as the 1883 Ordinance Survey. Hedgerows on the additional parcels of land were also surveyed. A category of 'species-rich' (as defined by the UK BAP) was used to confirm hedgerows containing five or more woody species. The 2008 results are presented in Figure 9.8 (in Appendix B).

6.5 Results

Updated Desk Study

- 6.5.1 The Staffordshire Ecological Record Centre was contacted to update the ecological baseline, in August 2008.
- 6.5.2 No additional sites were noted. Additional species noted can be found in Table 6.1. Badger grid references have been withheld.

Table 6.1 - Updated Species Records for Curborough

Protected Species	
WCA Schedule 5 animals	
Badger (<i>Meles meles</i>)	SK XXX (1.3km southwest of the site boundary) Single badger reported dead 23.06.2006 SK XXX (1.3km southeast of the site boundary) Breeding confirmed. Recorded 2006 SK XXX (925m southeast of the site boundary). Breeding probable. Recorded 15.09.2006 SK XXX (722m south of the site boundary). Single found dead. Recorded 01.06.2006 SK XXX (1.2km northeast of the site boundary). Breeding confirmed. Recorded 2006
Great Crested Newt (<i>Triturus cristatus</i>)	SK 141 132 (341m southeast of the site boundary) adult breeding recorded 2007
WCA Schedule 1 birds	
Barn Owl (<i>Tyto alba</i>)	SK 14 14 (distance from site unknown) Single barn owl recorded 13.12.2007
Red Kite (<i>Milvis milvis</i>)	SK 14 14 (distance from site unknown) Single record recorded 08.01.2008
Other Notable species e.g. Red list or BAP priority species	
Lapwing (<i>Vanellus vanellus</i>)	SK 15 13 (distance from site unknown) Breeding probable recorded 30.04.2006
Corn Bunting (<i>Miliaria calandra</i>)	SK 15 13 (distance from site unknown) Single record recorded 25.03.2006

6.6 Field Survey

Phase I Habitat S

- 6.6.1 Field surveys to obtain baseline information about the site were undertaken on the 20th February and the 2nd, 3rd and 31st May 2007. Survey updates were undertaken on both the main site and the additional parcels of land, between April-May 2008.
- 6.6.2 During the field survey, all habitats present at the site, both natural and artificial were mapped using the standard methodology (JNCC, 1993). This is presented as a habitat map (Figure 9.1 within Appendix B). Any other site features that were considered of importance with relation to protected species potential or plant diversity were also highlighted using Target Notes (TN). Full details of the Target Notes can be found in 9.1 (within Appendix B). The updated Phase I survey for the main site identified a number of additional target notes, which have been added to this report. Most of the habitats encountered were in common with those identified from previous surveys and no rare or unusual plant species were identified.

Evaluation of the Important Habitats within the Site

6.6.3 In summary, the most important habitats of nature conservation value within the site remain:

- broad-leaved semi-natural woodland;
- trees;
- hedgerows;
- standing water;
- running water;
- built structures;
- semi-improved neutral grassland, and:
- arable land

6.6.4 The value of the woodland within the site has now been revised upwards, to **district value**, as both Big and Little Lyntus Wood contain ancient semi-natural woodland. The value of Fradley Wood remains at the **local** level.

6.6.5 The overall value of the hedgerow resource remain the same, although 13 species-rich hedgerows have now been identified (numbers 4, 8, 9, 11, 12, 14, 17, 20, 24, 36, 37 and 38 on Figure 6.8 within Appendix B).

6.6.6 There are no additional comments to add to this section, further to what was stated in the ES Chapter.

Evaluation of the Important Species within the Site

6.6.7 In summary, the most important species / groups of species of nature conservation value within the site are still considered to be:

- badger;
- great crested newt;
- bats;
- riparian mammals (otter & water vole);
- breeding birds, and:
- invertebrates

Badger

6.6.8 The 2007 badger survey revealed the presence of three main breeding setts within, or close to, the boundary of the application area. Four additional setts, identified during 2008, have been identified. Two of these are recognised as being breeding setts. Full details of the badger survey results and survey locations are provided in Figure 9.2 (within Appendix B). Based on the type and amount of territory in and around the application area, these are considered to be average clan and territory sizes.

6.6.9 As a result of these updated surveys the site is still assessed as being of **local value** for badgers.

Great Crested Newt

- 6.6.10 The GCN survey of 2007 identified the presence of GCN in three of the nine ponds surveyed. Surveys by FPCR identified GCN in three further ponds. 2008 surveys undertaken by RPS identified an additional two ponds containing GCN.
- 6.6.11 All ponds within, and surrounding the application area were subjected to a scoring system known as the Habitat Suitability Index (HSI). A table of results based on this approach can be found in 9.3b (within Appendix B).

Table 6.2 - Location and size of GCN populations

Pond number	Grid reference	Location	Peak number of GCN caught	GCN population (EN 2001)
3 (C)	SK 136 136	Within the north-western section of site	4	Small
7 (F)	SK 141 132	Within the north-eastern section of the site	4	Small
19 (AW)	SK 122 123	Outside site, within grounds of Curborough Hall Farm	7	Small
21 (AV)	SK 124 120	Outside site, west of Corporation Farm	1	Small
27 (AN)	SK 143 119	At East Hill, outside site (near to south-eastern corner)	1	Small
30 (AO)	SK 145 119	At East Hill, as above	7	Small
31 (AJ)	SK 145 119	At East Hill, as above	1	Small
35 (P)	SK 129 116	Outside site (near to south-western corner)	1	Small

- 6.6.12 The 2007 GCN survey results yielded a peak count of four adult GCN in two ponds to the north of the site (3 and 7), suggesting a small population of GCN spread across the north-western and north-eastern sectors of the application site (English Nature 2001). The FPCR results also revealed low populations of GCN residing in three ponds (27, 30, and 31) in close proximity, within the East Hill region of the site, to the east of the proposed development.
- 6.6.13 The 2008 GCN survey results also identified low numbers in two ponds within 100 metres of the proposed tertiary road link, to the west of the site (numbers 19 and 21).
- 6.6.14 The ES Chapter identified the network of ponds within the site to be of **regional importance** for GCN. The 2008 survey results suggest that all populations are small; no significant breeding populations have been encountered. As a result the importance of the site for GCN has been reduced to **County** level.

Bat Species

Bat Activity Surveys

- 6.6.15 Two bat activity surveys were undertaken in July 2007, which identified relatively few bats to be using the site in order to forage/ feed. A total of 12 bats were observed in total, mainly Common pipistrelle.
- 6.6.16 Ten additional bat activity surveys were undertaken in 2008. These focussed on likely commuting routes for bats (e.g. hedgerows), and on potential areas for feeding (e.g. woodland blocks).

Table 6.3 - Summary of Bat Transect Data - Number of Bats Identified Per Habitat (2007/8 Results)

Species of bat	Canal, stream	Woodland	Hedgerow	Arable
Pipistrelle	7	14	14	28
Daubenton's	9	0	0	0
Noctule	0	0	0	1
Brown Long Eared	0	1	0	3

- 6.6.17 The 2008 bat activity results generally concur with the findings of the 2007 surveys. Common pipistrelle were the most common bat identified, the majority of which were identified along woodland edges, or along hedgerows or in fields to the south of the site. Daubenton's were restricted to the canals. Brown Long-Eared bats were infrequent, and noctules absent from the 2008 surveys.
- 6.6.18 Considering the size of the site, relatively few bats were encountered during the activity surveys. A large number of those that were recorded were generally commuting, rather than actively feeding.
- 6.6.19 A number of bat commuting routes were established, mainly along hedgerows. A summary map showing all these commuting routes can be found on Figure 9.4a (within Appendix B).

Tree Roosts Assessments

- 6.6.20 Over 550 trees are present within the site, of which the majority are considered as having negligible potential for roosting bats. A total of 101 trees were assessed as having high, medium or low potential to support roosting bats. All trees with a high potential to support roosting bats that are due for felling were subject to dawn swarming surveys in 2008. The location of these trees can be found on Figure 9.4b (within Appendix B).
- 6.6.21 The surveys confirmed bat roosts in two of these trees. As current design plans show that both these trees are due to be felled, appropriate mitigation will need to be put in place prior to removal.

Building Assessments

- 6.6.22 All buildings and structures were subjected to detailed internal external survey by a licensed bat worker. Two emergence surveys and a dawn swarm survey were undertaken on Gorse Farm.
- 6.6.23 Common pipistrelle bats were confirmed to be roosting in Gorse Farm. A dead Brown Long-Eared bat was also found within the roof void of this building, along with a number of droppings. There are no other suitable buildings for roosting bats within the site.

- 6.6.24 The ES chapter identified the value of the site for bats to be **local**. The findings of the 2008 surveys support this.
- 6.6.25 Full details of the 2008 bat results and survey locations are provided within Appendix B – Technical Report and Figures 9.4a-l.

Riparian Mammals

Otter

- 6.6.26 The desk study returned records of otter from within 1 km of the site (at SK 148 112 east of the site boundary, and at SK 148 112, north east of the site boundary), and otter surveys in February 2008 revealed a number of spraints on the Coventry Canal in the vicinity of the Park & Ride scheme. The Trent and Mersey Canal, which runs along the site boundary, is also known to support the passage of otters. Therefore it is considered highly likely that otters are using both canals in the vicinity of the site. They may also be using Curborough Brook and Mare Brook on an occasional basis.
- 6.6.27 The findings of the ES chapter suggested that the canals adjacent to the site have **County importance** for otters, and the site itself has **local value**. The findings of the 2008 surveys support this.
- 6.6.28 Full details of the 2008 results and survey locations for otters are provided within the 9.5b and Figure 9.5 (within Appendix B).

Water Vole

- 6.6.29 The water vole has been in serious decline in Staffordshire over the last 20 years (Staffordshire BAP). However, both the Trent and Mersey Canal and the Coventry Canal are still thought to support the species. Surveys were undertaken along all stretches of canal that are adjacent to the site, and for a distance of approximately 1 km beyond. No evidence of water vole was recorded during either the 2007 and 2008 surveys. Curborough Brook, Mare Brook and Business Brook were also surveyed, again without success.
- 6.6.30 The ES Chapter identified the site to be of **value within the zone of influence** for water voles, and with appropriate management to have a potential value at **district level**. The 2008 surveys support this.
- 6.6.31 Full details of the 2008 results and survey locations for water voles are provided within Figure 9.5 (in Appendix B).

Birds

- 6.6.32 The site was assessed for both breeding and wintering birds as per the methods outlined in the ES Chapter.

Breeding Bird Survey

- 6.6.33 A breeding bird survey was undertaken on the main site in 2007. Additional breeding bird surveys were undertaken on the additional land areas in 2008. A single additional bird survey of the main body of the site was also undertaken in April 2008, to update the baseline. A barn owl survey was also undertaken in 2008, for the whole site.
- 6.6.34 Table 6.4 summarises the bird data identified from the whole site. It identifies species that are on the RSPB's BoCC (Birds of Conservation Concern) Red and Amber lists (RSPB 2007). The table summarises the findings of both the 2007 and 2008 surveys.

Table 6.4 - Birds of Conservation Concern Identified from Survey

Bird	2007 (numbers or pairs)	2008 (pairs)	Status
Grey partridge	Occasional	1	Red List
House Sparrow	Occasional	6	Red List
Yellowhammer	Frequent	9	Red List
Skylark	5	19	Red List
Barn Owl	1 single bird sighted on two separate occasions	0	Amber List
Dunnock	Occasional	22	Amber List
Kestrel	0	1	Amber List
Swallow	Occasional	12	Amber List
Wood Warbler	1	0	Amber List
Willow warbler	1	19	Amber List
Bullfinch	0	8	Red List
Linnet	0	6	Red List
Reed bunting	0	7	Red List
Song thrush	0	13	Red List
Meadow pipit	0	4	Amber List
Mistle thrush	0	3	Amber List
Starling	0	7	Red List
Goldcrest	0	3	Amber List
Grasshopper warbler	0	1	Red List
Green woodpecker	0	1	Amber List
Stock Dove	0	1	Amber List
Willow tit	Several	2	Red List

- 6.6.35 A total of 48 species of bird were identified during the surveys. Of the breeding species recorded 10 were listed on the UKBAP and/or Red List, and a further 10 species were listed on the Amber List. No species listed on Schedule 1 were recorded during the surveys.
- 6.6.36 In total 22 bird species appearing on the RSPB Red and Amber lists have been identified on site.
- 6.6.37 The site, as a whole, contains a good range of common species, which would be expected in the habitat types encountered. No nationally significant assemblages or nationally rare / scarce species of conservation concern were noted from the surveys.
- 6.6.38 Fuller (1980) has classified values according to species-richness at sites, based on the number of breeding birds present. The scale is summarised on Table 6.5.

Table 6.5 - Fullers' Classification Values of Species-Richness of Bird Sites

	Species Richness and Importance			
	National	Regional	County	Local
Breeding birds	85 +	70-84	50-69	25-49

- 6.6.39 The site was assessed in the ES Chapter as having **local** value to breeding birds in the ES Chapter. However, the 2008 surveys have revealed a higher number of Red and Amber List bird species use the site, and as a result the overall value of the site for breeding birds has been upgraded to **district** level.
- 6.6.40 Full details of the results for the 2008 breeding bird surveys are provided within the 9.6b and Figures 9.6a-f (within Appendix B).

Wintering Birds

- 6.6.41 The wintering bird surveys of 2007 revealed no populations of either regional or national importance and the study area is considered particularly poor for this group of species. A single flock of around 50 lapwing and a covey of around 12 grey partridge were seen during one of the visits. Otherwise, the surveys identified no other species. As a result the ES Chapter summarised the site to be of value within the zone of influence for wintering birds.
- 6.6.42 No additional surveys have been undertaken, and the value for wintering birds remains the same. Full details of the results for the 2007/8 wintering bird surveys are provided within Figures 9.7 (within Appendix B).

Barn Owl

- 6.6.43 Barn owl surveys for the entire site were undertaken in 2008. No evidence of roosting barn owl was found. They may, however, occasionally forage in and around the site. The value of the site for barn owls was considered by the ES Chapter to be **local**. The findings of the 2008 surveys support this.
- 6.6.44 Full details of the results of the 2008 barn owl survey can be found within the 9.6b (within Appendix B).

Invertebrates

- 6.6.45 No species protected under the Wildlife and Countryside Act (1981), Red Data Book or Nationally Scarce species were recorded during the invertebrate surveys, undertaken in September 2008.
- 6.6.46 The site is also considered to be generally unsuitable for Staffordshire BAP species, such as 'Brownfield' butterflies and ground-nesting solitary bees and wasps. One UK Biodiversity Action Plan moth, the garden dart (*Euxoa nigricans*), was recorded during survey.
- 6.6.47 The habitat assessment of the site for invertebrates concluded that the woodland areas contain the highest potential value, in particular any blocks or compartments that contain woodland of a sufficient age and structure to support invertebrates that feed on dead or dying wood. Other than these woodland areas, the site is not considered to contain any habitats of particular value to invertebrates.
- 6.6.48 The value of the site to invertebrates is therefore considered at present to be **local**, although further survey has been recommended for some species groups.
- 6.6.49 Full details of the results of the 2008 Invertebrate surveys can be found within the 6.9 and on Figure 9.9 (in Appendix B).

Other Species

Grass Snake / Other Reptiles

- 6.6.50 A survey for grass snakes was considered too onerous given the size of the site, but it is assumed that grass snake occur in low numbers in the wetter parts of the site, adjacent to ponds and water-courses. In general, the site was considered unsuitable for reptiles other than grass snakes, and was considered in the ES Chapter to be of value **within the zone of influence** value for reptiles. The value remains unchanged for these species.

Brown Hare

- 6.6.51 Desk study records for brown hare exist from within north end of the site (at SK 139 134). They were not seen during the initial Phase I habitat survey or on any subsequent surveys. However, large sections of the development area are considered suitable for brown hare, in particular the grasslands and arable fields. As many of these habitats are replicated outside the development area, the biological value of the site for brown hare was considered to be within the zone of influence. The value remains unchanged for these species.

Impacts

- 6.6.52 The key impacts identified within the ES Chapter from both the construction and operation stages of the proposed development remain the same, i.e:

Construction impacts include the following:

- loss of habitat;
- fragmentation of habitat;
- impact on protected species;
- noise impacts on sensitive receptors such as birds;
- increased hazard to wildlife from construction traffic;
- water impacts resulting from contaminated run-off from the site;
- dust, and
- lighting impacts

Operational impacts include the following:

- increased hazard to wildlife from residential traffic;
- lighting impacts;
- risk to wildlife from human disturbance, and:
- noise impacts on sensitive receptors such as birds

Habitat Loss

- 6.6.53 The ES Chapter stated that the initial construction phase would result in the loss of a number of habitat types within the development footprint, including large areas of open farmland, small areas of semi-natural woodland, scattered trees, hedgerows and grasslands. Subsequent changes to the masterplan mean that the relative impacts on these receptors have now changed.
- 6.6.54 Approximately 18 % of the original woodland resource, 47 % of the original hedgerows, 50 % of the grasslands and 100 % of the arable land currently on site will be lost to the proposed development. Table 6.6 summarises the respective habitat losses.

Table 6.6 - Tables of Habitat Loss / Gain

Habitat Type	Current status of resource (ha, m or number)	Amount of resource to be lost	Amount of resource to be created	Total resource post construction	Percentage gain / loss of resource
Woodland	32.5 ha	5.8 ha	13.91ha	39.18 ha	+20%
Hedgerows	9,100 m	4,250 m	10,800 m	15,651 m	+72%
Grassland	17.2 ha	9.6 ha	38.1 ha*	45.76 ha	+170%
Arable	135.7 ha	135.7 ha	0	0	- 100%
Ponds	17	5	6**	18	+ 5%
<i>*Does not include off-site mitigation **Does not include balancing ponds</i>					

Key Habitats

Woodlands

- 6.6.55 The ES Chapter described the impact of the proposed development on this resource to be **negative** and the confidence level to be **certain**. The impact was considered to be **significant** at the **local level**. As the development will be residential housing, the impact would also be **permanent** and **not reversible**.
- 6.6.56 The revised masterplan indicates that the proposed loss of woodland within Fradley Wood remains the same, and as such the Update supports this statement.

Hedgerows

- 6.6.57 The landscaping plans submitted with the ES indicated that up to 46% of the total length of the hedgerow resource of the site was to be lost to the development. This included sections of two species-rich hedgerows. As all hedgerows within the site have some value as wildlife corridors for

bats, birds and small mammals, any loss will lead to fragmentation and a loss of connectivity between other habitats (e.g. trees).

- 6.6.58 The impact of the proposed development on this resource was considered to be **negative** and the confidence level was **certain**. The impact was considered to be **significant** at the **local level**. The impact would also be **permanent and not reversible**.
- 6.6.59 The revised masterplan indicates that the proposed loss of hedgerows will be reduced. All species-rich hedgerows within the site will be safeguarded fully (or in part) by changes in the layout, and by 5 metre offsets from the nearest development. Losses to the hedgerow network will be largely restricted to species-poor hedges.
- 6.6.60 However, the initial losses of significant numbers of hedgerow suggest that the proposed impact remains unaltered.

Trees

- 6.6.61 The loss of a number of trees will impact on this resource across the development area. All trees are of value to nesting birds, and provide feeding areas, refuge and transitory corridors for a variety of wildlife. In addition to their intrinsic value and their value as a connecting habitat, additional surveys have identified a number of trees (17) that have high potential value to roosting bats.
- 6.6.62 The impact of the proposed development on this resource was considered to be **negative** and the confidence level **probable**. The impact was considered to be **significant within the zone of influence**. The impact would be **permanent and not reversible**.
- 6.6.63 The revised masterplan indicates that ten of these trees with high potential for roosting bats will be lost to the development. Bat surveys have since been undertaken on all these trees, and roosting bats were found within two trees. However, the intrinsic value of these trees to other species remains, and the proposed impact remains unchanged.

Semi-Improved Grasslands

- 6.6.64 It was estimated in the ES Chapter that around 6 ha of the present grassland areas would be lost to the development. Whilst generally not of high conservation value, this still represented a significant proportion of the resource (38 %). This figure has now risen to 56 %.
- 6.6.65 The impact of the proposed development on this resource remains **negative** and the confidence level **probable**. The impact is still considered to be **significant within the zone of influence**. The impact is still thought to be **permanent and not reversible**.

Ponds, Standing Water

- 6.6.66 Revisions to the masterplan have resulted in the potential loss of five ponds (numbers 4, 5, 6, 41 and 49), representing 29 % of this resource from across the development area.
- 6.6.67 Surveys indicate that all but one of these ponds presently have low conservation value. Pond 4 is a steep-sided concrete structure, stocked with fish. Ponds 6 and 41 are shallow, highly ephemeral water bodies with no associated aquatic or marginal vegetation. Pond 5 suffers from heavy shading and eutrophication. Pond 49 is a relatively recent pond, situated within the proposed 'Park and Ride', and has been planted with a range of aquatic and marginal species. Amphibian surveys on this pond in 2008 did not identify any GCN but did reveal the presence of a small number of smooth newt. This pond is considered to have some value to nature conservation due to its size and range of plant species.
- 6.6.68 The impact of the proposed development on this resource was originally considered to be **negative** and the confidence level was **probable**. The impact was considered to be **significant within the zone of influence**. The impact was assessed as **permanent and not reversible**.
- 6.6.69 The proposed impact based on 2008 survey remains unchanged.

Impact on Protected Species

- 6.6.70 The construction phase will result in a significant loss of habitats and without appropriate mitigation will have an impact on badger, great crested newt, bats, barn owl and a few common species of breeding birds. Riparian mammals (otter, water vole) will be unaffected by the loss of habitat. The construction impacts on species are largely the same as the long-term impacts, with the main issue being loss of habitat.

Badger

- 6.6.71 Five main breeding setts have now been identified within, or close to the development area (Figure 9.2 Appendix B).
- 6.6.72 None of the five main badger setts will be lost as a result of this development. However, significant areas of four of the territorial ranges will be lost, and the populations may become more isolated without careful planning and appropriate mitigation. In addition, the setts will also be more closely situated to residential dwellings and the associated local amenities. This may increase the level of human disturbance that each clan currently experiences.
- 6.6.73 The ES chapter assessed the impact on badger as **negative**. The confidence level was **probable**. The impact was considered to be **significant** at the **local** level. The impact would be **permanent** and **not reversible**.
- 6.6.74 The Update continues to support this assessment.

Great Crested Newt

- 6.6.75 During the 2007 surveys, GCN were found to be present in three ponds (numbers 3, 7 and 35 on Figure 9.3a in Appendix B). Pond 3 is 120 metres north of the nearest proposed development. Pond 7 is 20 metres north of the nearest proposed development. Pond 35 is 340 metres south of the proposed development. GCN found within these ponds will use the surrounding terrestrial habitat as a foraging resource outside the breeding season (March-June). As much of this terrestrial habitat was to be lost, the impact on GCN was originally considered to be **major negative** and the confidence level was considered **certain**. The impact was considered to be **significant** at the **regional** level, and would be **permanent and not reversible**.
- 6.6.76 The impacts described above have changed. The loss of terrestrial habitat has been reduced, and the amount of land available for enhancement has been increased. Additional surveys in 2008 have also revealed the presence of GCN within a total of five new ponds, all outside the application area, but within 500 metres. However, all these populations are small, and the importance of the site to GCN has been reduced. The overall impact of the development on these colonies is now considered to be **negative** and the confidence level **probable**. The impact is considered to be **significant** at the **County** level, and would be **permanent and not reversible**.

Bats

- 6.6.77 As a number of habitats affecting bats and their potential roosting sites will be lost to the scheme, the impact is assessed to be **negative**. Surveys of the residential buildings, aircraft hangars, pill-boxes and all other on-site structures revealed a low potential for roosting bats (other than at Gorse Farm).
- 6.6.78 The confidence level was **probable**. The impact on bats was considered to be **significant** at the **local** level. The impact was considered to be **permanent and not reversible**.
- 6.6.79 The revised masterplan and updated surveys indicate that this statement should be changed. Very few roosting bats were identified from the extensive surveys undertaken in 2008. A number of foraging and commuting routes were identified from survey, which are all to be retained, post-development. Therefore the revised impact on roosting bats is considered to be **minor negative**, and the confidence level **probable**. The impact on bats is **considered to be significant** at the **local** level.

Barn Owl

- 6.6.80 As virtually all habitats affecting barn owl and their potential roosting sites will be lost to the scheme, the previous impact was considered to be **negative**, and the likelihood was **probable**. The impact was considered to be **significant** at the **local** level. The impact will be **permanent and not reversible**.
- 6.6.81 Additional surveys in 2008 did not confirm the presence of roosting or foraging barn owl. The report concluded the potential impact on barn owl to be **minor negative, significant at the local level**. The Update supports this revised impact assessment.

Breeding Birds

- 6.6.82 As a significant number of habitats affecting breeding birds will be lost to the development the magnitude on them was initially assessed as **negative**. The confidence was **probable**. The impact was considered to be **significant** at the **local** level. The impact was **permanent and not reversible**.
- 6.6.83 Breeding bird surveys in 2008 confirmed the presence of significant numbers of Red or Amber List species from within the site. Based on this information, the revised impact on breeding birds is considered to be **negative, significant at the district level**.

Wintering Birds

- 6.6.84 The revised masterplan has no further impact on wintering birds, and the impact assessment remains unchanged.

Otter / Water Vole

- 6.6.85 The revised masterplan has no further impact on otter or water vole, and the impact assessment remains unchanged.

Invertebrates

- 6.6.86 As a number of habitats affecting invertebrates will be lost to the scheme, the impact is assessed to be **negative**. The confidence is **probable**. The impact is considered to be **significant** at the **local** level. The impact will be **permanent and not reversible**.

Reptiles

- 6.6.87 The revised masterplan has no further impact on reptiles, and the impact assessment remains unchanged.

Brown Hare

- 6.6.88 The revised masterplan has no further impact on brown hare, and the impact assessment remains unchanged.

Noise Impacts on Sensitive Receptors Such as Birds

- 6.6.89 The revised masterplan has no further impact and the impact assessment remains unchanged.

Increased Hazard to Wildlife from Construction Traffic

- 6.6.90 The revised masterplan has no further impact and the impact assessment remains unchanged.

Water Impacts Resulting from Contaminated Run-Off from the Site

- 6.6.91 The revised masterplan has no further impact and the impact assessment remains unchanged.

Dust

- 6.6.92 The revised masterplan has no further impact and the impact assessment remains unchanged.

Lighting Impacts

- 6.6.93 The revised masterplan has no further impact and the impact assessment remains unchanged.

6.7 Operational Impacts

Increased hazard to wildlife from residential traffic

6.7.1 The revised masterplan has no further impact and the impact assessment remains unchanged.

Lighting Impacts

6.7.2 The impact of lighting will be reduced on key ecological receptors, in particular Big and Little Lyntus Woodland, and on hedgerows. Development to the north of Big and Little Lyntus (and to the north of the new planting belt) will be soft landscape, and will have no associated lighting. Land to the south will be buffered by the creation of 15 metre stand-offs around all woodland edges, and 5 metre stand-offs around all hedgerows will reduce the impact on these receptors.

6.7.3 The potential unmitigated magnitude of the effect was considered to be negative, the duration not permanent and reversible. The impact was considered to be significant within the zone of influence. The confidence level was probable.

6.7.4 Whilst there will be some reduction in the effects of lighting to key areas, the overall impact assessment remains unchanged for the whole site, and therefore the Update continues to support this assessment.

Risk to Wildlife from Human Disturbance

6.7.5 The revised masterplan has no further impact and the impact assessment remains unchanged.

Noise Impacts on Sensitive Receptors Such as Birds

6.7.6 The revised masterplan has no further impact and the impact assessment remains unchanged.

Table 6.7 - Revised Summary of Construction Impacts

Proposed Activity	Characteristic of unmitigated impact on the feature	Significance without mitigation and confidence level
Site clearance and construction; removal of habitat	Loss of habitat – woodland Sections of Fradley Wood to be cleared for development	Certain negative effect on conservation status Significant at the local level (no ancient woodland affected)
	Loss of habitat - hedgerows	Certain negative effect on conservation status, significant at the local level
	Loss of habitat - trees	Probable negative effect on conservation status The impact is significant within the zone of influence
	Loss of habitat - grasslands	Probable negative impact considered to be significant within the zone of influence
	Loss of habitat - ponds	Probable negative effect on conservation status Significant within the zone of influence
Site clearance and construction: fragmentation of habitats.	The development will cause the fragmentation of all above described habitats	Probable negative effect on conservation status Significant at the local level (hedgerows and woodland)
Impact on protected species	Loss of badger habitat	Probable negative effect on conservation status Significant at the local level
	Loss of GCN terrestrial habitat	Probable negative effect on conservation status Significant at the County level
	Loss of bat habitat / roost sites	Probable minor negative effect on conservation status Significant at the local level
	Loss of barn owl habitat / breeding sites	Probable minor negative effect on conservation status Significant at the local level
	Loss of breeding bird habitat	Probable minor negative effect on conservation status, significant at the district level
	Loss of wintering bird habitat	Probable neutral effect on

Proposed Activity	Characteristic of unmitigated impact on the feature	Significance without mitigation and confidence level
		conservation status Not considered significant
	Loss of otter/water vole habitat	Probable neutral effect on conservation status Not considered significant
	Loss of invertebrate habitat	Probable negative effect on conservation status Significant at the local level for woodland Not significant for other habitat areas
	Loss of reptile habitat	Probable minor negative effect on conservation status Significant within the zone of influence
	Loss of brown hare habitat	Probable minor negative effect on conservation status Significant within the zone of influence
Noise impacts	Increased noise levels from machinery and traffic	Certain negative effect on conservation status of a number of species, e.g. birds The impact is considered to be significant within the zone of influence
Increased hazard to wildlife from construction traffic	Increased risk of collisions with vehicles	Probable negative effect on conservation status Significant within the zone of influence
Water impacts resulting from contaminated run-off from the site	Development site borders Coventry Canal and Trent & Mersey Canal Run-off into these water bodies possible	Probable negative effect on habitats and conservation status Significant at the district level
Increased dust	Dust from construction may impact on adjacent habitats, e.g. woodland	Probable negative effect on habitats and conservation status Significant within the zone of influence
Lighting impacts	Construction lighting may impact on sensitive habitats e.g. canals, woodlands	Probable negative effect on habitats and conservation status Significant within the zone of influence

Table 6.8 - Revised Summary of Operational Effects

Proposed Activity	Characteristic of unmitigated impact on the feature	Significance without mitigation and confidence level
Residential traffic	Increased hazard to wildlife from residential traffic	Probable minor negative effect on conservation status on badgers and other species Significant within the zone of influence
Lighting	Lighting impacts of development, especially near woodlands, hedgerows	Probable negative effect on conservation status of bats Significant within the zone of influence
Human disturbance	Risk to wildlife from human-related disturbance, e.g. dogs	Probable negative effect on conservation status on badgers and other species Significant within the zone of influence
Noise	Increased ambient noise levels from residential use	Probable minor negative effect on conservation status of a number of species, e.g. birds Significant within the zone of influence

6.8 Mitigation Measures

- 6.8.1 This section sets out those mitigation measures that form part of the development proposal. The incorporation of the measures identified has been further influenced by the revised masterplan, consultation with statutory consultees for nature conservation, and the findings and recommendations of the 2008 ecological studies.

6.9 Habitat Creation and Management

Site Management Plan

- 6.9.1 A 'Site Management Plan for Nature Conservation' will be written in order to safeguard and manage all retained areas of conservation interest. This will form part of an over-arching Landscaping Management Plan, which will also incorporate other relevant components such as hydrology, land drainage and SUDS. The nature conservation section will include reference to all habitat and species issues, and will include the mitigation packages for protected species such as bats, badgers and GCN. Local wildlife experts will be used to inform the plan at all times and it will be produced in full co-operation with the statutory consultees.

Woodland Creation

- 6.9.2 The loss of around 5.8 ha of woodland will be mitigated by the additional planting of 13.91 ha. The highest quality woodland within the site, Big and Little Lyntus, will each increase in size, and will be joined together by a planting scheme that ensures a 90 m average width of newly planted native woodland. This whole resource will be suitably buffered by 15 metre offsets, and additional soft landscaping to the north. The ground flora within the new woodland belt will be enhanced by a planting scheme that will use locally-sourced, native seed and plants.
- 6.9.3 Sections of Fradley Wood will be lost, but these will represent the poorest quality blocks in terms of their species composition and structural diversity. The loss of woodland within Fradley Wood has been largely restricted to even-aged stands of plantation conifers and birch. All sections of high quality native woodland within Fradley Wood have been retained. Considerable effort has been made to prevent fragmentation of the highest quality blocks to the west of Fradley Wood, and also to attempt to link woodlands within the local context. To this aim, a 30 metre strip of native woodland planting will extend southwards from Fradley Gorse, to meet Big Lyntus.
- 6.9.4 All new planting within sensitive areas will be of native trees of local provenance (where possible), in keeping with the local character of the woodlands already present.
- 6.9.5 The planting of trees and shrubs will take place as early as possible once the development is underway, in order to allow it to establish quickly. All planting schemes and management will fall under the remit of the management plan.
- 6.9.6 In summary, a 20 % increase in the final amount of broadleaved woodland reflects an overall net gain to the woodland resource and associated biodiversity within the local area.

Hedgerows

- 6.9.7 The total hedgerow resource will increase, from a present baseline of 9,100 metres to 15,650 metres. The majority of this increase will be along the proposed secondary and tertiary road links, although there will be a number of additional hedgerows created. All new hedgerow planting will use a variety of native tree species, in order to create diverse hedgerow structures and species compositions.
- 6.9.8 All of the species-rich hedgerows identified from survey (numbers 4, 8, 9, 11, 12, 14, 17, 20, 24, 36, 37, 38 and 39 on Figure 9.8 in Appendix B) will be retained, either in full, or in majority sections. Stand-offs of 5 metres on either side of all hedgerows will ensure that the ground flora and any associated invertebrate fauna will be suitably protected. A suitable linkage of the most important hedgerows (from both north to south and east to west) will be retained throughout the development, which will continue to provide a connective corridor to species such as bats.
- 6.9.9 The management of all the species rich hedgerows to be retained within the site will fall under the remit of the management plan.

Grasslands

- 6.9.10 Newly created grassland communities will more than compensate for the proposed losses of around 9.6 ha of tall ruderal communities, which are found mainly to the north. A total of 38.1 ha of formal/informal open space will be created, much of which will be managed for nature conservation interests. Many of these areas will be seeded with locally sourced wildflower mixes and will be managed (by cutting) specifically for nature conservation interests. This will benefit a range of UK and Staffordshire BAP species. Targeted areas for grassland creation include around the balancing pond to the north-east, at Fradley Junction Conservation area to the north-west, at the Local Park (opposite Tesco) to the east, at the Riverside Park to the west, and at the District Park to the south-east.

6.10 Off-Site Mitigation for Arable Loss

- 6.10.1 The total loss of 135.7 ha of arable fields will have a negative impact on a limited number of wildlife species traditionally associated with farmland landscapes, in particular Staffordshire BAP species such as skylark and brown hare. As a result, a package of off-site mitigation has been agreed with a local landowner under a proposed Section 106 agreement. A total of 32 ha of land has been allocated for conversion to grassland, some of which will be managed principally for their wildlife interest. In particular, the conversion of arable land to traditional hay meadows in at least three of these fields represents a significantly improved resource for farmland wildlife species.
- 6.10.2 In other areas, new hedgerows will be established, and field corners will be fenced off and sown with wild-bird seed mixes. The management of all the new grasslands will fall under the remit of the Section 106 agreement.
- 6.10.3 The proposed fields are to the south of the site and adjacent to other 'soft landscaped' areas (such as the District Park), which together with the new grasslands will form an important mosaic of habitats for wildlife species.

Ponds

- 6.10.4 At least six new ponds will be created that will have significantly improved wildlife value compared to those that are due to be lost to the development. For example, the enhancement of the 'Conservation Area' at Fradley Junction will include the establishment of three new ponds, and surrounding wetland and wildflower meadows, native tree and shrub planting, and the provision of new hibernacula. All new ponds established for wildlife will have extensive planting schemes, using a range of native aquatic and marginal species.
- 6.10.5 All retained ponds will be safe-guarded by appropriate long-term management, such as dredging and the clearing away of overhanging vegetation, and will again be enhanced by planting schemes of native species.
- 6.10.6 The balancing ponds to the north and south will also be subject to a sensitive planting scheme. In particular, the establishment of reed beds within the balancing pond to the south-east is proposed, which will contribute to the Staffordshire BAP Targets for *Reedbeds*.
- 6.10.7 The management of all the ponds within the site will fall under the remit of the management plan.

Connectivity

- 6.10.8 There will be a number of 'green corridors' created through the site, linking key habitats in the north to those in the south. The planting of trees and shrubs in order to prevent fragmentation will link key habitats. Where possible, these corridors will be unlit. Fradley Wood in the north will be linked to Big Lyntus in the south by a 30metre strip of woodland planting of native species. Big and Little Lyntus will be connected by a 90 metres belt of native planting. The retention of woodland and additional planting of trees along green avenues will also retain links between established woodland areas to the centre of the site.
- 6.10.9 All the recognised bat commuting routes have been retained within the new masterplan. These routes, mainly along existing hedgerows, will allow for bats and other wildlife species to continue to utilise the site, post-development.

Badger Mitigation

- 6.10.10 On development sites major construction activities within 30 metres of a badger sett require a licence from Natural England. As a result, all proposed development works will be at least 30 metres from the nearest sett entrance. These setts will be safeguarded during construction by the erection of temporary hoardings, which will be maintained throughout the construction phase.
- 6.10.11 The 2008 badger bait-marking surveys have identified the need for the following mitigation for badgers:
- The construction of a mammal tunnel under Wood End Lane to reduce the risk of isolation of the setts within Fradley Wood, and reduce the risk of traffic collisions;
 - The construction of at least two mammal tunnels under the proposed tertiary road to reduce the risk of habitat fragmentation (particularly for sett 8). The tunnels should be located along existing and well used badger footpaths;
 - The construction of fences along both sides of the tertiary road in the territory of Sett 8 to prevent badgers from crossing the road;
 - The planting of hedgerows or areas of dense native and locally sourced scrub around setts 1-2, 4, 7 and 8, in order to discourage people from discovering the setts and also to reduce human disturbance as much as possible;
 - The proposed allotments to be fenced to discourage badgers from entering them and eating crops;
 - The areas surrounding the setts to be kept as dark as possible. Security lighting and sport ground lighting, particularly at the school, sports centres and community parks must be kept to a minimum.
- 6.10.12 A mitigation strategy for badgers will be written to encompass all these points, and will be approved by the LPA/Natural England prior to implementation. This will form part of the overarching management plan for the whole site.

Great Crested Newt Mitigation

- 6.10.13 Three ponds were found to contain GCN from the 2007 RPS surveys (numbers 3, 7 and 35). Three additional ponds outside the site boundary (numbers 27, 30 and 31 in the vicinity of East Hill) were identified by FPCR as having low populations of GCN. The 2008 surveys revealed the presence of GCN in two ponds adjacent to the tertiary road link (19, 21).
- 6.10.14 Whilst none of the ponds will be directly affected by the development proposals, some terrestrial habitat surrounding them will be lost. The limiting factor to the GCN populations across the whole site appears to be a combination of both the quality of the terrestrial and aquatic resource, and fragmentation of habitat by farmland. As a result there is scope for improvement of both the aquatic and terrestrial resource in ponds within the control of the client.
- 6.10.15 During the development phase, newt fencing will be required in order to separate construction areas from ponds and terrestrial habitat where newts may be found. All works will be subject to development licences issued by Natural England, and subject to an agreed Working Method Statement.
- Improvement of Terrestrial Habitat around Pond 3 and Creation of New Ponds
- 6.10.16 Pond 3 is 120 metres north of the nearest proposed built area of the development. At present the GCN population of this pond and associated habitat is small.

6.10.17 There will be a net loss of terrestrial habitat that will need to be compensated for by the creation of new habitats. To mitigate for the loss of terrestrial habitat, land adjacent the Trent & Mersey Canal will be improved by the creation of Fradley Junction Conservation Area. In addition to the creation of three new ponds for GCN within this area there will be considerable enhancement works to the terrestrial environment. The use of SUDS will allow for this part of the site to become wetter, and a planting scheme will be devised to reflect this. This will include the creation of areas of wet and tussocky grassland around the ponds, the planting of stands of scrub, the reinforcing of existing hedgerows with additional planting, and the provision of a number of amphibian hibernacula within the grasslands and woodlands.

6.10.18 The additional ponds will be designed specifically for GCN and will be planted with a variety of species that provide both cover and egg-laying opportunities for GCN. The management of the whole resource will fall under the over-arching management plan for landscape and nature conservation, and it will become a wetland reserve that will benefit a variety of other species, including other amphibians, grass snake, invertebrates, and (potentially) water vole.

Improvement of Terrestrial Habitat around Pond 7 and Creation of New Ponds

6.10.19 Pond 7 is 30 m north-east of the nearest proposed development. At present the GCN population of this pond and associated habitat is small.

6.10.20 The initial loss of terrestrial habitat surrounding this pond was initially considered to be too high to retain this population *in situ*. It was therefore proposed that the GCN population be translocated to a suitable receptor site elsewhere in the area. However, changes to the masterplan have resulted in an increased amount of terrestrial habitat to be retained, and it is now considered viable to retain the population in its present range (approximately 2 ha of proposed housing to the north-east of the pond will now be grasslands). The breeding pond is currently within woodland, and overshadowed by trees. Management works will be undertaken to improve the breeding resource for GCN, by clearing overhanging vegetation, dredging works and the introduction of marginal and aquatic plant species. Two additional ponds will also be created, which will be managed for GCN.

6.10.21 The terrestrial habitat within this area will be improved for GCN. The area will become a Local Park, with an emphasis on creation newt habitat. A 15 metre stand-off from the woodland edge will be sown with tussock-forming grass species, and this will be continuous along all the woodland edge to the north. Additional works will include the provision of hibernacula within the grasslands and woodlands. The use of SUDS in the vicinity of the housing development to the south will reduce the risk of GCN and other amphibia being trapped in gully-pots. The details of this will be presented in the Working Method Statement.

Improvement of Terrestrial Habitat Surrounding Other GCN Ponds

6.10.22 All other ponds are outside the application area. Prior to the commencement of works around any of the above ponds, newt fencing will be required in order to separate construction areas from ponds and terrestrial habitat where newts may be found. All works will be subject to the issuing of suitable licences from Natural England, and subject to a Working Method Statement agreed with them.

Bat Mitigation

6.10.23 A bat mitigation plan will be produced in order to safeguard and enhance the conservation status of bats from within the site. This will be approved by the LPA and/or Natural England, and will be incorporated into the overall management plan. Specific bat mitigation will include:

Mitigation for Confirmed Bat Roosts

- 6.10.24 Two trees and one building have been confirmed as bat roosts in 2008. Three Common pipistrelles were seen entering one dead tree (1127) and a single Common pipistrelle was identified using tree 1353. Common pipistrelles and Brown Long-Eared bats are using Gorse Farm as a summer roost.
- 6.10.25 As both of these trees are due for felling, bat boxes will be erected on suitable alternative trees from within the site. The trees will be felled under a watching brief from a suitably qualified ecologist at an appropriate time of year. Plans for Gorse Farm are yet to be finalised, but will be accompanied by an appropriate mitigation plan specific to this building.

Creating Potential Bat Roosts on Present Structures

- 6.10.26 As stated in the ES Chapter, two WW2 pillboxes from within the site (SK 153 117 and SK 145 137) could be retained and modified to create roosting potential for bats.

Creating Potential Bat Roosts on New Buildings

- 6.10.27 As described in the ES Chapter.

Maintaining and Enhancing Feeding Corridors

- 6.10.28 The 2007 bat transect surveys revealed only a small number of bats to be foraging in the area. The 2008 surveys have confirmed a number of bat commuting routes within the site (see Figure 9.4a Appendix B), i.e:
- The Trent & Mersey Canal;
 - The Coventry Canal;
 - Along public footpath from Gorse Lane to Middle Lock (Fradley Wood);
 - Along Wood End Lane from Big Lyntus to Netherstowe Lane;
 - Around Big Lyntus Wood;
 - Along Netherstow Lane;
 - Along hedge 39, then hedge 15 towards East Hill;
 - Along hedge 17, towards and around perimeter of Rough Stockings;
 - Along hedges in vicinity of Secondary Road, Tertiary Road and Park & Ride.
 - All the confirmed bat commuting routes (mainly along hedgerows) have been safeguarded by the masterplan. These include all the species-rich hedgerows, and a number of others (for example hedgerow 15). Additional hedgerow and woodland planting will strengthen these commuting routes.

Barn Owls

- 6.10.29 The ES chapter stated that the loss of barn owl foraging territory would be mitigated for by creating and maintaining areas of infrequently mown neutral and wet grassland habitat particularly to the west of the site. The maintenance of coarse grassland areas would attract field voles and other small mammal species and so should provide suitable hunting habitat for barn owls. The creation of off-site hay meadows and other areas of rough pasture represent a further, significant improvement on the present resource for barn owl.
- 6.10.30 As barn owls often hunt from perches, wooden perching posts (2 metres in height) will be erected within grassland habitat. Barn owl nest boxes will also be erected in all areas of extensive grassland. The nest boxes and perching post will be erected away from busy roads in order to reduce the chance of vehicle collisions. The precise design and siting of barn owl perches and boxes will be chosen following consultation with the Staffordshire Wildlife Trust.

Breeding Birds

- 6.10.31 The planting of large areas of native woodland, particularly in and around Big and Little Lyntus Wood will benefit the range of woodland bird species identified during 2007/8 survey, as will the retention of all the older woodland blocks within Fradley Wood. In addition, 15 metre stand-offs around all woodland edges will create habitat for woodland-edge species.
- 6.10.32 A mosaic of habitats that best reflects that which is being lost, e.g. woodland/grassland/woodland edge habitat will be created in and around Big Lyntus. The creation of woodland glades within new areas of woodland will maximise the diversity of the newly created habitats and replicate some of the existing conditions within Fradley Wood.
- 6.10.33 The retention of all the on-site species-rich hedgerows and the establishment of a large network of new (native, species-rich) hedgerows will benefit bird species, as will the proposed 5 metres stand-offs around all these hedges.
- 6.10.34 Grassland habitats to the north of the site, such as those within the proposed Riverside Park, will be maintained. These habitats may hold a lesser diversity of species but do provide breeding sites for some designated species such as grey partridge, skylark and meadow pipit which may not benefit as highly from woodland and hedgerow mitigation.
- 6.10.35 Newly created grassland communities will more than compensate for the proposed losses of around 9.6 ha of tall ruderal communities, mainly to the north. A total of 38.1 ha of formal/informal open space will be created, much of which will be managed for nature conservation interests. Many of these areas will be seeded with locally sourced wildflower mixes and will be managed (by cutting) specifically for nature conservation interests, such as UK and LBAP species of bird and invertebrates.
- 6.10.36 The conversion of arable fields to the south of the site into more diverse grassland habitats would offer additional nesting and food resources to ground nesting designated species such as: skylark, meadow pipit and grey partridge, as well as additional food resources for other species. Well-managed grassland would also be likely to provide an increase in winter feeding value, enhancing survival levels and having a further positive impact on nesting populations by maintaining population levels throughout the year.
- 6.10.37 The provision of nesting boxes for designated species in trees along existing hedgerows will offer higher nesting potential than at present within the survey areas.

Invertebrates

- 6.10.38 The retention and extension of important blocks of woodland, in particular in and around Big and Little Lyntus, will be of benefit to saproxylic invertebrates (considered to be the most important invertebrate groups present on-site). The retention of the older blocks of woodland within Fradley

Wood will also be of benefit, for the same reasons. Retention of species-rich hedgerows and their ground flora (via 5 metre stand-offs), and the establishment of new hedgerows will maintain and enhance connecting corridors for invertebrate species, especially mobile ones such as butterflies.

- 6.10.39 The sensitive management of the District Park and the creation of hay meadows to the south of the red-Line boundary will benefit invertebrates, especially the unmanaged margins and headlands.

Grass Snake

- 6.10.40 A Working Method Statement for Reptiles will be written prior to development, in order to safeguard any reptiles from being killed during the destructive stages of the development. This will be particularly relevant in and around any ponds or wet areas that may harbour grass snakes. The WMS will be agreed in principle with the LPA ecologist and Natural England, and will include potential receptor sites if any reptiles are found.
- 6.10.41 Fradley Park Conservation Area will be managed primarily as a GCN reserve, and as such the addition of new ponds and the creation of boggy conditions will greatly suit grass snake. Other wetland areas will be created to the north east and to the south east of the site. These will also result in a general benefit to grass snakes.

Brown Hare

- 6.10.42 The creation of hay meadows and rough pasture to the south of the site will benefit brown hare, as will the sensitive management of these habitats. Retained and created grasslands to the west (e.g. by Big Lyntus and the Riverside Park) and south of the site (e.g. around the District Park) will also benefit this species, and management of these areas will be sensitive to brown hare and other grassland species.

6.11 Lighting Mitigation

- 6.11.1 Changes to the masterplan since the original ES submission have resulted in a significant reduction in the amount of built land surrounding Big and Little Lyntus. Light pollution in these areas, and in the vicinity of Fradley Wood is already significant. Bat surveys undertaken in 2008 revealed that there is already significant light pollution from security lighting in the vicinity of both Fradley Wood and Little Lyntus Wood (see Figure 9.4a Appendix B).
- 6.11.2 It is proposed that the use of a sensitive lighting scheme in the vicinity of these woodland (and other sensitive) habitats will result in a net reduction of lighting pollution in these areas. Stand-offs of at least 15 metres around woodland edges and 5 metres on either side of hedgerows will also lessen the impact of lighting in these key areas.
- 6.11.3 As stated in the ES, there will be no additional lighting impacting on any of the water courses (canals or streams). 'Dark Corridors' will ensure that water courses are not affected, and in other ecologically sensitive areas the use of low-level lighting, low-pressure sodium lights, and the fitting of hoods will be considered, in order to reduce light spillage. The detailed specifications of such lighting will be subject to subsequent approval by the LPA.

Residual Effects

- vegetation clearance prior to construction (loss of habitat);
- fragmentation of habitats;
- impacts on protected species;
- human disturbance, and:
- lighting impacts

Table 6.9 - Table of Residual Effects

Proposed Activity	Impact on the feature	Mitigation	Residual significance and confidence level
Loss of habitat	Loss of habitat – woodland Sections of Fradley Wood to be cleared for development	Significant Increase in woodland resource in key areas, post development Improvement of remaining woodland by selective planting and management Management Plan	Probable negative effect Significant at the local level in the medium term: In the longer term: probable positive effect
	Loss of habitat - hedgerows	Retention of all species-rich hedges Significant Increase in hedgerow resource, post development Management Plan	Probable positive effect at the local level
	Loss of habitat - trees	Retention of many important trees & enhanced planting of important trees Management Plan	Probable negative effect within the zone of influence in the medium term: significant In the longer term: not significant
	Loss of habitat - grasslands	Off-site creation of hay meadows and rough grassland Creation of new grassland areas within District Park, Local Parks and Riverside Park Management Plan	Probable positive effect within the zone of influence
	Loss of habitat - ponds	Retention & enhanced planting of important ponds Creation of at least six new ponds Management Plan	Probable positive effect within the zone of influence
Fragment of habitats	The development will cause the fragmentation of all above habitats	Retention of species-rich hedges Retention of all bat commuting routes Linking of woodlands via planting scheme Management Plan	Probable negative effect at the local level in the medium term: significant In the longer term: not significant

Proposed Activity	Impact on the feature	Mitigation	Residual significance and confidence level
Species impacts	Loss of badger habitat	Mitigation strategy for badgers written, to form part of Management Plan Establishment of new habitat (woodlands, hedgerows, grasslands) Creation of underpasses to allow access to all retained habitats	Probable minor negative effect at the local level: significant in the short term Not significant in the long term
	Loss of GCN terrestrial habitat	Mitigation strategy for GCN written, to form part of Management Plan Creation of new ponds and terrestrial habitat in vicinity of GCN breeding pools Management of current pools	Probable positive effect at the County level Significant in the long term
	Loss of bat habitat	Mitigation strategy for bats written, to form part of Management Plan Retention of all bat commuting routes Creation of additional water bodies to north and southeast of site Pillbox alterations to create new roosting habitat Installation of 'bat friendly' features into new buildings	Probable minor negative effect at the local level Significant in the medium term Not significant in the long term
	Loss of barn owl habitat/ breeding sites	Erection of owl perches and nest boxes to south of site Off-site creation of hay meadows and rough grassland Management Plan	Probable minor negative effect at the local level: significant in the medium term In the longer term: not significant
	Loss of breeding bird habitat	Establishment of new woodlands, hedgerows and grasslands Off-site creation of hay meadows and rough grassland Management Plan	Probable negative effect at the district level : significant in the medium term In the longer term: not significant
	Loss of brown hare habitat	Establishment of new hedgerows Off-site creation of hay	Probable minor negative effect within the zone of influence : significant

Proposed Activity	Impact on the feature	Mitigation	Residual significance and confidence level
		meadows and rough grassland Management Plan	in the medium term In the longer term: not significant
	Loss of invert habitat	Retention and expansion of key woodland areas Retention and expansion of hedgerow resource Creation of grasslands to south	Probable minor negative effect at the local level Significant in the medium term Not significant in the long term
Human disturbance	Risk to wildlife from human-related disturbance, e.g. dogs	Fencing off, or planting of thorny hedgerows or scrub to discourage public from sensitive areas	Probable minor negative effect within the zone of influence: significant in the medium term In the longer term: not significant
Lighting impacts	Potential light-spill into sensitive areas from residential housing, despite mitigation attempts Lighting of newly planted hedgerows along access roads	Lighting strategy to use low level lighting where possible, fitting of hoods and use of low-pressure sodium lights in sensitive ecological areas Creation of dark corridors along water courses and other sensitive habitats	Probable minor negative effect significant within the zone of influence

6.12 Cumulative Impacts

6.12.1 Table 6.10 lists the current / approved planning applications in the Fradley area.

Table 6.10 - Current / Approved Planning Applications of Relevance to Site

Applicant & number	Location	Decision	Nature of proposal	Ecology
Fradley Park Ltd 05/00657/FUL	Fradley Business Park, Common Lane, Fradley, Lichfield SK 150 127	Approved 09/01/2006	Infilling balancing pond	Mitigation for GCN and water vole mentioned in decision notice
Fradley Park No2 Ltd 07/00370/FUL	Location: Hangers 1 & 2 Fradley Airfield Gorse Lane Fradley Lichfield Staffordshire WS13 8PA	Approved 01/10/2007	Construction of new access road and gatehouse	(Within 250m of GCN pond)

Applicant & number	Location	Decision	Nature of proposal	Ecology
Fradley Park Ltd 05/00910/FULM	Location: Gorse Lane, Fradley, Lichfield Grid reference: SK 144 136	Approved 18/11/05	Landscaped balancing pool	Designed with ecology in mind, barn owl boxes, bird seed mixes, otter holt, marshy areas
Fradley Park Ltd 07/00563/FULM	Site And Premises At Former Lucas Varity PLC Wood End Lane	Approve 30/08/2007	Erection of industrial warehousing units with associated ancillary offices and associated external works	No issues
Prologis Developments Ltd 07/00774/OUTM	Land At Easthill Farm Wood End Lane Fradley Lichfield WS13 8NF	Not as yet	Industrial and warehouse development with ancillary offices, associated gatehouses, car parking and servicing, landscaping, roads and footpaths	Environmental Statement July 2007 by Turley Assoc., Ecology by FPCR.

6.12.2 Of the above applications, two have particular relevance to this scheme:

Planning application 05/00910/FULM (Fradley Park Ltd)

6.12.3 This application was approved on 18/11/05, and will involve the creation of a wildlife-friendly mosaic of habitats within the far north-eastern section of the current site, immediately south of the Coventry Canal (OS grid reference: SK 144 136). The works will include landscaped balancing pond planted with a variety of native marginal and aquatic species, the erection of three barn owl boxes, the creation of an otter holt, and the seeding of grassland areas with a bird-friendly mix.

Planning application 07/00774/OUTM (Prologis Developments Ltd)

6.12.4 This application has not yet been determined. The application is for the extension of the business park at East Hill (OS grid reference: SK 144 1118). Land take will reduce foraging habitat for badger (sett 5, Figure 9.2 Appendix B) and GCN (ponds 27, 30 and 31, Figure 9.3a in Appendix B). A GCN mitigation scheme for the proposed East Hill development includes the provision of new ponds and terrestrial habitat for GCN.

6.12.5 The masterplan for the current application will not impact further on badger, as the bait-marking studies have shown that these badgers are not foraging south of 'Business' Brook.

6.13 Conclusions

- 6.13.1 The delayed decision on location and alignment of secondary and tertiary access roads resulted in the survey window being missed for a number of species groups, resulting in a commitment to the production of this ecological Update.
- 6.13.2 During a course of meetings following this initial submission, it became clear that the masterplan did not fulfil the needs of the statutory consultees for ecology and nature conservation, and all parties agreed that a rare opportunity existed for revising this document. The opportunity was also made to enter into dialogue over the need for additional surveys to fully inform the ecological baseline.
- 6.13.3 For example, it was felt by some of the consultees that national and regional policy had not been fully met, in particular with reference to PPS9 and the Regional Spatial Strategy (RSS11) for the West Midlands.
- 6.13.4 It was also felt that some habitats and species listed in the Staffordshire Biodiversity Action Plan (BAP) or on the NERC Act 2006 Section 41 list were not sufficiently mitigated for within the ES text. As a result, additional surveys were undertaken in Spring-Summer 2008, and mitigation proposals outlined for these species/groups of species.
- 6.13.5 This Ecology Update is the response to these varying concerns and issues. To show how this revised document meets the needs of national, regional and local policy, the following information, whilst largely repeating text already laid out in previous chapters, shows explicitly how the proposal meets the needs of PPS9, the West Midlands Regional Spatial Strategy, the Lichfield Local Plan and Local Development Framework, the Staffordshire and Stoke-on-Trent Joint Structure Plan, the UK and Staffordshire BAP, and the NERC Act 2006 Section 41 list in protecting and enhancing habitats and species.

Habitats

National Policy

Planning Policy Statement 9 (PPS9) – Biodiversity and Geological Conservation

- 6.13.6 PPS9 sets out the Government's broad policy objectives in relation to the protection of biodiversity and geological conservation in England through the planning system, and its proposed planning policies that will help deliver these objectives. These policies reflect statutory obligations for nature conservation, and are firmly based on the principles set out in 'Working with the grain of nature – a biodiversity strategy for England' (Defra, 2002).

PPS9:1 - The Key Principles

1. Six key principles are laid out in PPS9 for regional and local planning authorities to adhere to when assessing the impact of a planning application on biodiversity and geological conservation. In summary these are:
2. Development plan policies and planning decisions should be based upon up-to-date information;
3. Plan policies and planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. In taking decisions, local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment;
4. Plan policies should take a strategic approach to the conservation, enhancement and restoration of biodiversity and geology;
5. Plan policies should promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development.

6. Development proposals where the principal objective is to conserve or enhance biodiversity and geological conservation interests should be permitted.
7. The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests.

6.13.7 The following text summarises briefly how these key principles (where relevant) have been met:

1. The desk study has been updated in 2008, and a large number of surveys have now been undertaken over a two-year window on a wide range of habitats and species. The ecological baseline for the site has now been robustly described.
2. All protected habitats and species have been assessed adequately, and this has informed the masterplan. As a result, the impact on these habitats and species has been reduced to an acceptable level, and in some cases enhanced. The development proposals will therefore maintain and enhance the majority of the conservation interests of the site. Where this has not been possible, mitigation has been provided.
3. The masterplan attempts to link habitats within the site to those outside, particularly in relation to woodlands and hedgerows.
4. A number of beneficial biodiversity features will be incorporated, including the merging of Big Lyntus Wood and Little Lyntus Wood, the creation of a wetland reserve at Fradley Junction, the conversion of arable fields to traditional hay meadows to the south of the site, and the establishment of large numbers of additional hedgerows.
5. Full regard has been given to the relevant policies throughout.
6. Where habitats or species have been threatened by the proposed development, adequate mitigation has been proposed that will reduce harm to an acceptable level.

PPS9:6-11 - Sites of Biodiversity and Geological Conservation Value

- 6.13.8 PPS9 states the importance of protecting designated habitats, at all levels. In response to this, the proposed development will not directly impact on any international or nationally designated sites, such as SACs, SPAs, or SSSIs. One local site, Fradley Wood BAS, will be directly affected by the proposed development. However, the compensatory effect on two other sites (Big and Little Lyntus, both ancient woodland and one a BAS) is considered to outweigh any detrimental impact on Fradley Wood.
- 6.13.9 PPS9 also states that other important natural habitat types that have been identified in the Countryside and Rights of Way (CROW) Act 2000 section 74 list, as being of principal importance for the conservation of biodiversity in England should be protected, and opportunities should be identified to enhance and add to them. As the CROW section 74 list has now effectively been replaced by the NERC 2006 Section 41 list ('Habitats of Principal Importance in England'), all following text refers to this document.
- 6.13.10 Making specific reference to the site, a number of Habitats of Principal Importance are currently found within the application area, i.e:
- Woodland lowland mixed deciduous woodland;
 - Boundary hedgerows;
 - Freshwater eutrophic standing waters;
 - Freshwater ponds, and:
 - Arable field margins.

6.13.11 All these habitats (except arable field margins) will be safeguarded and enhanced by the development proposals. It is also proposed that three additional Habitats of Principal Importance will be created, post development:

- Grassland lowland meadows;
- Wetland reedbeds, and:
- Woodland wood-pasture and parkland.

PPS9: 12 - Networks of Natural Habitats

6.13.12 PPS9 states that networks of natural habitats provide a valuable resource, as they can link sites of biodiversity importance and provide routes or stepping stones for the migration, dispersal and genetic exchange of species in the wider environment. Such networks should be protected from development, and, where possible, strengthened by or integrated within it.

Linkages and connectivity have been a key component to the revised masterplan at Curborough. Woodland and hedgerow linkages have been increased and commuting corridors for bats safeguarded. Within the local context, woodland planting will increase connectivity to woodlands outside the site.

PPS9: 14 - Biodiversity within Developments

6.13.13 PPS9 states that development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. The revised masterplan and ecology Update has built on previous efforts to achieve this, and the overarching management plan will ensure that all the ecological features proposed in this document will be implemented.

PPS9: 15-16 Species Protection

6.13.14 Wildlife species other than those receiving statutory protection have been identified as requiring conservation action as 'Species of Principal Importance' for the conservation of biodiversity in England. These include those species identified within Table 6.11 Appendix B. Where potential harm may result to these species from the proposed development, the effects have been mitigated for.

Regional Policy

West Midlands Regional Spatial Strategy (RSS)

6.13.15 The RSS provides a broad development strategy for the West Midlands. Key policies relating to nature conservation have been described here. RSS targets for key habitats overlap somewhat with habitat targets for the Staffordshire BAP. As a result, a single response to these targets has been made here.

RSS QE1: Conservation & Enhancement of the Environment

6.13.16 Protect and where possible enhance:

- Lowland oak and mixed deciduous woodlands;
- Ancient and species-rich hedgerows;
- Cereal field margins;
- Rivers and streams, and:
- Standing open waters, ponds and canals.

6.13.17 All of the above habitats are dealt with in the following section.

RSS QE7: Protecting, managing and enhancing the Region's Biodiversity and Nature Conservation Resources

i) Encouraging the maintenance and enhancement of the Region's wider biodiversity resources.

Habitats – Woodlands

RSS Annex B Targets

6.13.18 The RSS target for woodland (Annex B) for the whole of England is to restore and recreate up to 1,700 ha by 2020.

6.13.19 Staffordshire BAP Targets

- Maintain and enhance all good examples of woodland through appropriate management by 2010.
- Restore and / or improve 300 ha (10% of County resource) of all replanted ancient woodland by appropriate natural regeneration / planting regimes by 2010.
- Increase the area of native woodland by 300 ha in appropriate areas by 2010.

6.13.20 The proposed scheme will contribute to all these woodland targets, by increasing the overall woodland resource by over 5 ha. The coverage of lowland oak and mixed deciduous woodlands within the site will be increased, from a present 32.5 ha, to 38.88 ha. The highest quality woodlands within the site, Big and Little Lyntus, will both be increased in size, and they will be joined together by a planting scheme that ensures a 90 metre average width of newly planted native woodland. This whole resource will be suitably buffered by 15 metre offsets to the south, and additional soft landscaping to the north. The ground flora within the new woodland belt will be enhanced by a planting scheme that will use locally-sourced, native seed and plants.

6.13.21 Sections of Fradley Wood will be lost, but these represent the poorest quality blocks in terms of their species and age composition. Considerable effort has been made to prevent fragmentation of the highest quality blocks to the west of Fradley Wood, and also to attempt to link woodlands within the local context. To this aim, a 30 metre strip of native woodland planting will extend southwards, to meet Big Lyntus. The central areas of Fradley Wood will be developed, as these are the poorest in quality in terms of their species composition and structural diversity. Again, 15 metre buffers will extend around all woodland areas.

Habitats – Hedgerows

RSS Annex B Targets

6.13.22 The target for hedgerows is to restore 100 % of ancient/species-rich hedgerows by 2010.

Staffordshire BAP Targets

- Prevent any further net loss of ancient/diverse hedgerows within Staffordshire.
- Increase the net amount of diverse hedgerow by 200 km through new planting by 2010.
- Maintain overall numbers of hedgerow trees and ensure that there are no net losses from 2001 onwards.
- Achieve favourable management for 200 km of all ancient/diverse hedgerows by 2010.

6.13.23 The scheme will contribute to the RSS Annex B and Staffordshire BAP targets for hedgerows, by safeguarding all of the species-rich hedgerows, and significantly increasing the overall hedgerow resource.

- 6.13.24 The total hedgerow resource will increase, from a present baseline of 9,100 metres to 15,650 metres. The majority of this increase will be along the proposed secondary and tertiary road links, although there will be a number of other hedgerows created. All new hedgerow planting will use a variety of native tree species, in order to create diverse hedgerow structures and species compositions.
- 6.13.25 All but two of the species-rich hedgerows identified from survey (numbers 4, 8, 9, 11, 12, 14, 17, 20 and 24, 36, 37, 38 and 39 on Figure 9.8 in Appendix B) will be retained in full. Two hedges, 9 and 17 will be largely retained, but will lose some sections.
- 6.13.26 Stand-offs of 5 metres on either side of all hedgerows will ensure that the ground flora and any associated invertebrate fauna will be suitably protected. A suitable linkage of the most important hedgerows (from both north to south and east to west) will be retained throughout the development, which will continue to provide a connective corridor to species such as bats.

Habitats - Cereal Field Margins

Staffordshire BAP Targets

- To create and maintain 600 km of 2-metre field margin strips and beetle banks within arable fields by 2010.
 - To create and maintain 500 km of 6-metre field margin / wildlife buffer strips within arable fields by 2010.
- 6.13.27 Cereal field margins can be a valued resource to farmland birds and a range of invertebrate species. The majority of land to the south of the site is under arable production, with few field margins identified of sufficient quantity to be of value to many of these species.
- 6.13.28 However, a package of off-site mitigation has been agreed with a local landowner to convert three arable fields into traditional hay meadows. These fields, with land coverage of around 13 ha out of the 32 ha of former arable identified to go to new grassland, will be managed primarily for wildlife. Whilst not meeting a specific LBAP habitat target, it should be recognised that the conversion of arable fields to hay meadows represents a greater benefit to farmland BAP species, than maintaining field margins.

Habitats – Rivers and Streams

Staffordshire BAP Targets/Objectives

- Maintain and improve the quality of water in Staffordshire's rivers and streams so that they can support a higher biodiversity.
 - Maintain existing important natural river features.
 - Restore and create further 'natural' river features in key areas.
- 6.13.29 No rivers will be affected by the development. Three streams run adjacent to the application area, Curborough Brook (to the west), Mare Brook (to the south), and Business Brook (to the east). None of these will be directly affected by the development, but one (Mare Brook) will benefit indirectly from the change in management on land directly adjacent to it. Arable fields will be converted to grassland, with a subsequent reduction in the use of chemicals on these land areas.

Habitats - Ponds, Lakes and Canals

Staffordshire BAP Targets/Objectives

- To maintain the nature conservation value of existing ponds, lakes and their catchment areas through favourable management.
- Increase the number of open water bodies with nature conservation potential within the county.

- Aim to establish favourable conservation management on all good examples by 2010.
- Create 200 new non-recreational (not stocked with fish) ponds on land of low conservation value by 2010.
- Restore 200 non-recreational ponds on land of low conservation value by 2010.

6.13.30 Two canals, the Trent and Mersey and the Coventry border the site to the west and the north. Neither of these will be directly affected by the proposed development.

6.13.31 Revisions to the masterplan have resulted in the potential loss of five ponds (numbers 4, 5, 6, 41 and 49), representing 29 % of this resource from across the development area.

6.13.32 These will be replaced by at least six new ponds, in addition to new balancing ponds to the north east and south east, representing an overall increase in the resource. Retained ponds will be enhanced, as part of various great crested newt mitigation schemes for the area. The new ponds will be designed primarily for nature conservation, and will be located within 200 metres of ponds that have existing GCN populations. Three will be within Fradley Junction Conservation Area to the north-west, and two in the vicinity of pond number 7 (Figure 9.3a in Appendix B).

6.13.33 The breeding ponds themselves will be positively managed for GCN, and all management of these water bodies will be controlled by the implementation of a management plan.

6.13.34 The balancing ponds will also be subject to a sensitive planting scheme. In particular, the establishment of reed beds with the balancing pond to the south-east is proposed, which will contribute to the UK and Staffordshire BAP Targets for Reedbeds.

RSS QE8: Forestry and Woodlands

6.13.35 Section A. Development plans, other strategies and programmes should encourage tree cover in the Region to be increased, where it is appropriate to the character of the area, taking account of the Regional Forestry Framework, and in ways that reinforce and support the Spatial Strategy by:

- designing new planting and woodland expansion so as to maintain and enhance the diversity and local distinctiveness of landscape character within the Region, ensuring that new planting does not adversely impact on the biodiversity of a site;
- replacing woodland unavoidably lost to development with equivalent areas of new woodland preferably in the same landscape unit;
- realising the potential for creating larger multi-purpose woodlands, woodlands along transport corridors and reducing fragmentation of ancient woodlands;
- involving local communities wherever possible

6.13.36 New woodland planting schemes have been proposed that aim to maintain and enhance the diversity of woodlands in the local area. All new planting within sensitive areas will be of native trees of local provenance, in keeping with the local character of the woodlands already present. The loss of woodland within Fradley Wood has been largely restricted to even-aged stands of plantation conifers and birch. All sections of high quality native woodland within Fradley Wood have been retained.

6.13.37 The loss of woodland within Fradley Wood has been offset by a planting scheme that significantly enhances Big and Little Lyntus, the highest quality woodland within the site. At present these two ancient woodlands are separated, with Little Lyntus isolated from any other woodland habitat. The proposals will result in these two woodlands being connected. Connectivity between these two ancient woodland and Fradley Wood has also been increased. It is therefore considered that there is a net gain to the woodland resource and associated biodiversity within the local area.

- 6.13.38 The ancient woodlands would be sensitively managed, with a mixture of nature conservation and public enjoyment interests catered for. It is envisaged that Little Lyntus would have restricted public access, due to its extensive ground flora and dense understorey. This would be achieved via the fencing-off of the sensitive areas of this woodland. Big Lyntus could have a variety of footpaths or cycle-ways introduced.
- 6.13.39 The joining of Big and Little Lyntus will therefore create a larger multi-purpose woodland along a transport corridor (Wood End Lane) and reduce the fragmentation of these ancient woodlands. Local communities could be included in the management of the woodlands via their contribution to management committees or forums once the woodland is established.

6.14 Regional Biodiversity Strategy - the West Midlands Biodiversity Partnership

- 6.14.1 The West Midlands Biodiversity Partnership has recently produced the document '*Restoring the Region's Wildlife: Regional Biodiversity Strategy for the West Midlands*' (January 2009). In meeting one of their key challenges, the Partnership has produced a list of fourteen Biodiversity Enhancement Areas (BEAs). One of these, the Cannock Chase to Sutton Park Biodiversity Enhancement Area, lies close to the western border of the application site.
- 6.14.2 The Cannock Chase to Sutton Park BEA Project encompasses an area of approximately 670 square km extending from the edge of Birmingham northwards into Staffordshire. This part of the West Midlands is located within the Cannock Chase and Cank Wood Joint Character Area.
- 6.14.3 The Project area is characterised by two core areas of semi-natural habitat: Cannock Chase and Sutton Park. These areas support significant amounts of lowland heath habitat along with a range of additional habitats including acidic and neutral grasslands, scrub, woodland and wetlands. The main biodiversity objective for the project is the restoration of wildlife-rich heathland landscapes. However, additional targets include the promotion of broadleaved woodland. As such, the proposed planting scheme along the western spine of the site (from Fradley Wood southwards) will contribute to an increased connectivity of this habitat in the vicinity of the Cannock Chase to Sutton Park BEA.

Staffordshire and Stoke-on-Trent Structure Plan 1996-2011

Policy NC5: Biodiversity

- All key Staffordshire BAP habitats and species covered (see Table 6.11).

Policy NC6: Important Semi-Natural Habitats

- All ancient woodlands retained and enhanced.

Policy NC 7B: Sites of National Nature Conservation Importance

- No national sites affected.

Policy NC 7C: Sites of Local Nature Conservation Importance

- There will be no impact on any SBI within the site, or adjacent to it.
- The impact on Fradley Wood (BAS) will be mitigated for by enhancing connectivity to Big Lyntus, and by the expansion of Big and Little Lyntus.

Policy NC 8: Habitats of Protected Species

- Suitable mitigation has been suggested where an impact to a protected species has been identified.

Policy NC 13: Protection of Trees, Hedgerows and Woodlands

- All ancient woodlands retained and enhanced.

- 6.14.4 All species-rich hedgerows have been retained, and the overall length of hedgerow resource has increased.

Local Policy

The Lichfield Local Plan (and Local Development Framework)

Policy E.3: Trees and Woodlands

- All ancient woodlands retained and enhanced.
- All species-rich hedgerows have been retained, and the overall length of hedgerow resource has increased.

Policy E. 14: Water Habitat

- There will be no loss in the quantity and quality of water within the river catchment area. All streams and canals adjacent to the site will be safeguarded from the development.
- All standing water bodies and other wetland areas will be safeguarded or mitigated for.

Policy E.18B: Sites Designated Locally

- There will be no impact on any SBI within the site, or adjacent to it.

Species

The UK BAP - UK List of Priority Species and Habitats

- 6.14.5 Adopted in 2007, the new UK BAP list is an important reference source, bringing all the scientific information on UK BAP species and habitats together in one place. This list, a result of the most comprehensive analysis ever undertaken in the UK, contains 1,149 species and 65 habitats that have been listed as priorities for conservation action under the UK Biodiversity Action Plan (UK BAP).

The Staffordshire BAP – Species Action Plans

- 6.14.6 The Staffordshire BAP incorporates all relevant national species, and also includes additional species that may have particular value within the county.
- 6.14.7 Table 6.11 refers to Staffordshire BAP species that have either been identified from within the site (or from the desk study), or that could be attracted to the site with appropriate management.

Table 6.11 - Meeting Staffordshire BAP Targets

Species	Relevant Policy	Objective/target (if applicable)	How achieved
Noctule bat (<i>Nyctalus noctule</i>)	UK BAP, Staffordshire BAP and NERC Act (2006), Section 41	To retain and enhance suitable habitat to increase the distribution and population density	Production of a Bat Mitigation and Enhancement Scheme, implemented via Management Plan General increase in size of woodland across site Safeguarding and extension of hedgerows
Pipistrelle Bat (<i>Pipistrellus pipistrellus</i> and <i>P. pygmaeus</i>)	UK BAP, Staffordshire BAP and NERC Act (2006), Section 41	To maintain the current population of Pipistrelle within the County from 2001 onwards	Production of a Bat Mitigation and Enhancement Scheme, implemented via Management Plan General increase in size of woodland across site Safeguarding and extension of hedgerows
Otter (<i>Lutra lutra</i>)	UK BAP, Staffordshire BAP and NERC Act (2006), Section 41	To maintain and enhance current populations through good habitat management To promote expansion of populations by the natural re-colonisation of river catchments	Sensitive management of all water courses for otter, via implementation of Management Plan
Water vole (<i>Arvicola terrestris</i>)	UK BAP, Staffordshire BAP and NERC Act (2006), Section 41	Restore 50 targeted sites within the county (particularly where recent local extinctions have occurred) to encourage natural re-colonisation	Sensitive management of all water courses for water vole, via implementation of Management Plan
Brown hare (<i>Lepus europaeus</i>)	UK BAP, Staffordshire BAP and NERC Act (2006), Section 41	To maintain (and expand) the current existing populations within Staffordshire	Creation of off-site hay meadows and grassland to south Management Plan will oversee new grassland within site to south
Barn owl (<i>Tyto alba</i>)	UK BAP, Staffordshire BAP and NERC Act	To double the Staffordshire population by 2010, and to have	Creation of hay meadows and grassland to south and erection of barn owl boxes

Species	Relevant Policy	Objective/target (if applicable)	How achieved
	(2006), Section 41	increased it to 100 pairs by 2020	and perches Implementation via Management Plan
Grey Partridge (<i>Perdix perdix</i>)	UK BAP, Staffordshire BAP and NERC Act (2006), Section 41	To halt the decline, in both numbers and range, of the grey partridge Increase the range and distribution of grey partridge by 20% by 2010	Creation of hay meadows and grassland to south
Skylark (<i>Alauda arvensis</i>)	UK BAP, Staffordshire BAP and NERC Act (2006), Section 41	In the medium term, to enhance the breeding population of skylark in all habitats in which the species occurs Seek to increase the current population by 20% by 2015	Creation of hay meadows and grassland to south
Lapwing (<i>Vanellus vanellus</i>)	UK BAP, Staffordshire BAP and NERC Act (2006), Section 41	In the short term, to maintain the present breeding population and range In the medium term, to increase the numbers and breeding distribution of lapwing	Large balancing ponds to south will be managed sensitively for wildlife interests, to include lapwing, and implemented via Management Plan
Farmland seed-eating birds	Stafford-shire BAP	To reverse the decline in farmland seed-eating birds	Creation of hay meadows and grassland to south, additional grassland areas and hedgerow establishment, via Management Plan
Grass snake (<i>Natrix natrix</i>)	UK BAP, Staffordshire BAP and NERC Act (2006), Section 41	To ensure that there is no decline in the range of the grass snake in Staffordshire by 2010	Creation of wetland reserves (e.g. Fradley Junction Conservation Area), and enhancement of general wetland resource via Management Plan
Great Crested Newt (<i>Triturus cristatus</i>)	UK BAP, Staffordshire BAP and NERC Act (2006), Section 41	Maintain the current range, distribution and viability of existing great crested newt populations	Production of a GCN Mitigation and Enhancement Scheme, implemented via Management Plan

Species	Relevant Policy	Objective/target (if applicable)	How achieved
		Enhance 30 sites known to have populations of great crested newts by appropriate management by 2010	
Ground Nesting Solitary Bees and Wasps	Stafford-shire BAP	Maintain all sites that support important populations of ground nesting solitary bees and wasps in a favourable condition	2008 invertebrate survey has established that the site is not suitable for these species
Invertebrates, general	UK BAP, Stafford-shire BAP and NERC Act (2006), Section 41	To promote conservation status of any protected or notable species identified from the lists	Older woodland stands to be retained and enhanced by planting and other management

6.15 Summary

- 6.15.1 The proposed development will not impact on any national or international sites designated for their nature conservation interest. The nearest designated site of European importance are Cannock Chase SAC (Special Area of Conservation), approximately 12 km to the west of the site, and the River Mease SAC, 4.7 km to the east of the site at its nearest point. Neither of these sites will be affected directly by the development proposal. There is the possibility that increased tourist visitor pressure on Cannock Chase SAC from the development will have an indirect impact on the integrity of this site, but the River Mease will be largely unaffected by any increase in visitor use.
- 6.15.2 As stated in the original ES Chapter, the area contains habitats that are commonly found within a predominantly agricultural landscape. The site contains two locally designated sites (Fradley Wood and Big Lyntus Wood, both BAS), and two areas of Ancient & Semi-Natural and Ancient Replanted Woodland (Big and Little Lyntus Wood). Current landscaping and development plans indicate that most of the valued ecological habitats will be retained. Sections of Fradley Wood are due to be lost to the development. Whilst this has been calculated to represent 18% (5.8 ha) of the resource, only areas of poor quality woodland are to be lost, whilst virtually all the mature woodland component is to be retained.
- 6.15.3 Revisions to the masterplan now show that there will be additional planting of woodland elsewhere, resulting in an overall increase of the woodland reserve, by over 5 ha. A large proportion of the increased woodland resource will be centred on Big and Little Lyntus, recognised by all parties to be the highest quality woodland within the site. Connectivity between woodland blocks has also been increased, and now a 30 metre strip of planting will connect Fradley Wood to Big Lyntus. Stand-offs of 15 metres around all woodland areas will protect these areas.

- 6.15.4 All 'species-rich' hedges (as defined by the UK BAP) are now to be retained, almost of them in their entirety. In addition, hedgerows that have been shown to have high commuting value to bats (such as hedgerow 15) are also retained. Stand-offs of 5 metres on both sides of all hedges mean that their ecological value is safeguarded, as the ground flora will be more easily retained. Additional planting of new hedgerows along access roads mean that the overall hedgerow resource has subsequently increased significantly.
- 6.15.5 Significant areas of grassland habitat will be created, both within and outside the red-line boundary. Targeted areas for grassland creation include Fradley Junction Conservation Area, the Riverside Park to the west, and the District Park to the south-east. 32 ha of off-site grassland will be created to the south of the site, in the vicinity of the District Park.
- 6.15.6 The site contains a number of important species warranting varying levels of statutory protection. GCN have now been identified in small numbers in two of the on-site ponds to the north of the site, and also in six off-site ponds to the south-west and south-east of the site. The new masterplan has already safeguarded the main GCN breeding ponds, and the surrounding habitat will be improved via the production of an overall GCN mitigation strategy, which will aim to enhance the aquatic and terrestrial habitat for GCN within the development site.
- 6.15.7 The 2008 badger surveys indicate that none of the five main badger setts will be lost as a result of this development. Whilst the development will not completely isolate any badger setts from their territory ranges, significant areas of the four of the territorial ranges (setts 4, 5, 7 and 8) will be lost, and a badger mitigation strategy will need to be implemented in order to safeguard these clans. The mitigation strategy will aim to enhance the quality of foraging within the remaining territory areas through appropriate land management.
- 6.15.8 Roosting bats have now been confirmed at three locations within the site, Gorse Farm and in two oak trees due for felling. All three roosts were small and were Brown Long-Eared or Common pipistrelle. Bats have also been shown to be using the site in low numbers in order to forage and commute (transect survey data 2007 and 2008). The masterplan proposals have already safeguarded the main bat commuting routes within the site, and all roosting and foraging/commuting bats will be further protected by the production of a Bat Mitigation Strategy, which will recommend a series of measures to enhance the site for bats.
- 6.15.9 Further surveys in 2008 continue to support the premise that the site is considered to offer low potential to any Schedule 1 protected bird species other than occasional foraging barn owl. A relatively high number of Red and Amber List bird species were identified, and appropriate mitigation has been recommended for these species. An invertebrate survey undertaken in September 2008 did not reveal the presence of any nationally rare or protected species, and only one UK BAP species.
- 6.15.10 Overall, the mitigation and enhancement works suggested will provide an overall benefit to a number of key habitats and groups of species, whilst for others the impact has been reduced to an acceptable level.

7. Landscape Character and Visual Impact Assessment

7.1 Introduction

7.1.1 The following text provides updated and additional information in response to issues raised by the consultees in respect of the ES (March 2008).

7.1.2 The landscape character and visual impact assessment comprised Chapter 10 in the original ES. For ease of cross referencing all references to drawings and tables numbers include the same prefix, namely.

7.1.3 Related figures and maps are contained within Appendix C of this document.

7.2 The Study Area

7.2.1 The size of the study area determined by the Visual Envelope (VE) and Zone of Visual Influence (ZVI) has been expanded to include additional viewpoints put forward by LDC and English Heritage. As these long distance viewpoints lie 4 to 12 km to the north and west of the site, beyond the scope of Figure 10.6 ZVI (in the original ES), they have been annotated on a new Figure 10.11- Additional Viewpoints, (in Appendix C.17).

7.3 Method Statement

Consultations

7.3.1 Original ES Table 10.1 summarised the consultations undertaken as part of the original ES (March 2008). A new table is given at the end of this Updated ES chapter to summarise how the issues raised by consultees in response to the original ES have been addressed.

Sources of Baseline Information

7.3.2 In respect of original ES Table 10.2 – the following source information has been updated:

- SPG Planning For Landscape Change Volumes 1 to 3 and accompanying appendix maps;
- Historic Landscape Character Map (HLC) and information provided by Staffordshire County Council (e-mail 04.08.08); and
- woodland felling/restocking within Fradley Wood, information provided by Forestry Commission (e-mail 05.09.09).

7.4 Criteria for Landscape Impacts

Landscape Sensitivity

- 7.4.1 Original ES Table 10.3 refers to historic related designations found within the study area, such as listed buildings and conservation areas. The Trent and Mersey Canal is designated a Conservation Area; but no such designation applies to the Coventry Canal. Refer to Chapter 10: Cultural Heritage for details of listed buildings, which are shown on Figure 10.4 (in Appendix C.3): Visual Envelope.

7.5 Criteria for Visual Impacts

- 7.5.1 The potential night-time impact of the proposal is assessed against factors such as whether an area is intrinsically dark, the presence of existing light sources, and the brightness of visible skyglow.

7.6 Baseline Conditions

Landscape Character at the Baseline

- 7.6.1 The site straddles two Region Character Areas (RCA), as defined by the Supplementary Planning Guidance to the Staffordshire and Stoke on Trent Structure Plan 1996 – 2011: 'Planning for Landscape Change'. These are:

- Trent Valley Washlands, Settled Heathlands character type; and
- Cannock Chase and Cank Wood, Settled Farmlands character type.

Table 7.1 – [Original ES Table 10.11] Character Areas and Types within the Site character defined by the Structure Plan 1996-2011

Character Area / Type	Key Characteristics	Typical Photographs
<p>Regional Character Area: Cannock Chase and Cank Wood</p> <p>Character Type: Settled Farmland</p> <p>Majority of site lying south of Wood End Lane lies within character area, except small part by Big Lyntus.</p>	<p>Triassic mudstones overlaid with non-calcareous brown soil.</p> <p>Characterised by irregular medium/large hedged fields, rolling landform, narrow winding lanes and hedgebanks, hedgerow oaks, streamside corridors, pasture farming, and dispersed settlement pattern.</p> <p>Incongruous features include: proximity/dominance of urban fringe of Lichfield, overhead power lines, busy roads, modern property improvements.</p> <p>Policy Objective: Landscape Restoration</p>	1, 2, 6, 12 and 14
<p>Regional Character Area 2: Trent Valley Washlands.</p> <p>Character Type: Settled Heathland</p>	<p>Infrequent landscape type associated with glacial / alluvial drift that formerly supported heathland.</p> <p>Characterised by interlocking woodlands and woodland</p>	3 and 5

Character Area / Type	Key Characteristics	Typical Photographs
Site area north of Wood End Lane and Fradley Wood lie within character area.	<p>edges, flat landform, straight roads, canal, regular pattern of small / medium fields with well-defined hedgerows and dispersed settlement patterns, urbanised in places.</p> <p>Incongruous features include surviving infrastructure of former WWII airfield and associated, expanding commercial industrial development, busy roads and overhead pylons.</p> <p>Policy Objective: Landscape Maintenance</p>	

Historic Landscape Character

- 7.6.2 Both Big and Little Lyntus are ancient woodland (see Chapter 6: Ecology and Nature Conservation)
- 7.6.3 Updated HLC information and maps have been provided by Staffordshire County Council. Detailed information for the Curborough area identifies the following:
- Fradley Wood as a mixture of C18 and C19 planned field systems, post 1880's small replanned fields / planned enclosure, and coniferous / broadleaved plantation;
 - land between Wood End Lane and Curborough Farm, and around Streethay, comprises early irregular enclosure and post 1800's reorganised fields; and
 - land between Curborough Farm and Brownfields Farm / urban edge of Lichfield as piecemeal enclosure.

Public Rights of Way

- 7.6.4 The footpath crossing east-west between Streethay and Curborough is also designated Darwin Walk. Sustrans National Cycle Route 54 follows Nether Stowe Lane across the site.

Views of the Baseline

- 7.6.5 Five additional, long distance views towards Lichfield and the site have been included in the baseline, as shown on Figure 10.11 (in Appendix C.17) and illustrated by new photo sheets in Appendix C7. The application site was screened in four of these views by intervening landform, development and vegetation. In the view from Abbots Bromley (Photograph 26, Appendix C.7), which lies approximately 12km north of the site, the spires in Lichfield and existing large scale industrial sheds of Fradley Park may be identified within the view by use of binoculars, as part of the wider settlement / landscape pattern.

- 7.6.6 New photograph 25, and original ES photographs 1 and 2 (see Figure 10.1: Topography & Viewpoints for location, in Appendix C.1) show the character of the gap between the application site and north-east edge of Lichfield. The undulating landform, local ridgeline adjacent to Curborough House, network of field hedgerows with trees and vegetation on the railway embankment limit potential views across the gap.
- 7.6.7 There are very few, ground level public viewpoints within Lichfield with views across the gap. The site is screened in ground level views from the historic core, southwards adjacent to the cathedral. There will be a small number of views from private locations within tower block towards the existing airfield.
- 7.6.8 The visual baseline includes a 60 metre high wind monitoring mast at the Watery Lane Sewage Works (Planning Ref. 08/00380/FUL).
- 7.6.9 At night time there is visible skyglow above the urban area of Lichfield (Photograph 1N, in Appendix C.7) and existing warehouse development at Fradley Park (Photographs 3N and 9N). The existing highway infrastructure including the A38, Hilliard's Cross Junction and Wood End Lane are all extensively lit for public safety.

7.7 Assessment of Visual Impact during Construction

- 7.7.1 Visual Impact Table (Appendix C.14) has been updated to reflect Staffordshire County Council (SCC) landscape character types, describe night-time views, and describe views from long distance viewpoints requested by LDC and English Heritage.
- 7.7.2 There are no significant impacts. With reference to Figure 10.6 in Appendix C.5, moderately significant, adverse visual impacts have been assessed on 13 of the 30 visual receptors (Viewpoints 1, 2 6, 7, 8, 9, 10, 12, 13, 14, 17, 18 and 24). There will be a similar impact on night-time views from these receptors as a result of construction lighting during winter months.
- 7.7.3 Review and further development of the original ES master plan has given rise to the following changes in assessment:
- Viewpoint 4 (Gorse Lane, north side of Coventry Canal) – there will be only glimpses of construction activities in the north-west area of the site, behind the existing tree screen; this is a negligible impact which will not be significant;
 - Viewpoint 19 (footpath north of Thatchmoor Farm) the new A38 interchange, and park and ride car park construction will be glimpsed behind intervening field vegetation; this slight impact will not be significant; and
 - Viewpoint 24 (access track to Bears Hay Farm) – there will be a major visual impact as a result of direct views of the new park and ride, and A38 interchange, which will be moderately significant.
- 7.7.4 The proposals will not give rise to any change in long distance views towards Lichfield and its spires from the viewpoints proposed by LDC and English Heritage (Viewpoints 26 to 30 inclusive).

7.8 Assessment of Visual Impacts on Completion

7.8.1 Assumed building and lighting column heights are given in the notes on Figure 10.6 ZVI during Construction/On Completion in Appendix C.5. There are no significant impacts. Moderately significant visual impacts will occur from the same viewpoints as described in the paragraphs above. While construction activities will have finished, they will be replaced by views of new buildings, roads and lighting.

7.9 Mitigation and Enhancement

7.9.1 The urban design and landscape design mitigation strategy has been developed further to address issues raised by consultee responses through the inclusion of appropriate landscape buffers adjacent to ancient woodland, and off-sets between woodland and edge of development, and additional wildlife connectivity linkages (see Figure 10.5 in Appendix C.4). Mitigation and enhancement measures will benefit both landscape and ecology as follows:

- creation of a strong sense of place and identity within the new development, and pleasant external environment for people;
- a strong, green framework and setting for the new development including the creation of a district park along the southern edge of the application site, town park to the north of Big and Little Lyntus, riverside park along the Curborough Brook, and local park between Fradley Wood and the Tesco warehouse, together with a hierarchy of smaller open spaces within each neighbourhood;
- retention of better quality trees (including TPO trees) and important hedgerows and assimilation of existing vegetation pattern into the open space network, as practical;
- sympathetic integration of formal and informal recreational uses, public footpaths / cycleways, ecological habitats, SUDS ponds / features into the open space network;
- appropriate segregation and protection of areas identified as key habitat areas through the adoption of open land uses and buffer zones, adjacent to key habitat areas (see Management Plan Framework in Appendix C.16); for example, Big and Little Lyntus, and new 'newt' reserve by Fradley Junction, important hedgerows;
- integration of the development, and secondary and tertiary link roads, into the surrounding countryside to reduce their visual impact on local views through appropriate landscape edge treatments;
- retention of a gap between the northern edge of Lichfield (delineated by the railway line) and southern edge of the new development, extending some 1km in width; the southern edge of the development will comprise green transitional uses such as the new district park, allotments, interlocking blocks of new tree and structure planting, designed to reflect the historic / extant landscape field pattern; areas of new hay meadow/species rich grassland will be laid out south of the district park to provide additional habitat areas;
- protection of the setting and character of the Conservation Area extending along the Trent and Mersey Canal through the retention of woodland blocks within Fradley Wood, and green buffer including the new 'newt' reserve;
- protection of the setting of the Coventry Canal, by retention of an average 20 metre width landscape buffer including existing and new screen/habitat planting; this planting will provide separation between the canal and the new A38 interchange, and proposed park and ride;
- protection of the setting and amenity of listed buildings;

- retention of the vista towards Lichfield Cathedral, within a sinuous corridor, extending south of Wood End Lane;
- replacement of trees and hedgerows lost to the development, with enhancement of the local vegetation pattern and new wildlife movement / connectivity corridors;
- new woodland and structure planting will principally comprise locally indigenous species as set out in the Plant Schedule, in Appendix C12 and will include areas of 'early' planting; and
- integration of existing public rights of way into the development, complimented by new routes designed to provide enhanced connectivity to Fradley Junction, Fradley Park, and the network of footpaths / bridleways crossing the gap.

7.9.2 A comprehensive, long-term management regime will be adopted in consultation with the Local Planning Authority and the statutory consultees. The landscape and ecological management framework in Appendix C.16 has been expanded to identify items to be agreed by specific condition, prescribe appropriate buffers to habitat areas, set out potential management mechanisms for the open space infrastructure, and include reference to the management of SUD's features.

7.10 Residual Impacts

7.10.1 20 years after planting there will be moderately significant visual impacts on Viewpoints 1, 2, 7, 13, 14, 17, 18 and 24 (see Figure 10.7 and visual Impact Table in Appendix C). There will be a corresponding magnitude of impact on night-time views from these same receptors as a result of the lit development and new street lighting. Assessment of the significance of impact on the following viewpoints has changed as a result of further development of the master plan in consultation with LDC and the statutory consultees:

- existing Viewpoint 2 (Junction Wood End Lane/Gorse Lane) where there will be direct views of new Local Centre from edge of employment area at Fradley Park, loss of view across open countryside, representing a moderately significant impact;
- new Viewpoint 24 (access track to Bears Hay Farm) – a moderate impact arising from views of new A38 interchange above new planted landscape buffer, which will also be moderately significant; and
- existing Viewpoint 4 (Gorse Lane, to north of Coventry Canal), where a negligible impact occurs as a result of glimpses of the new housing behind the existing tree belt; this will not be moderately significant.

7.10.2 The updated assessment of landscape impacts is set out in the table in Appendix C.13 which considers the long term changes in the landscape. There is no change to the assessment of significant, or moderately significant, impacts from that given in the original ES.

7.11 Summary

7.11.1 There are no significant landscapes or landscape character impacts caused by the proposals.

7.11.2 The change in the site from partly a rural to a developed nature will result in moderately significant adverse landscape impact on the character and tranquillity of the Settled Farmlands landscape character type, south of Wood End Lane, as well as there being a cumulative impact as a result of the creation of new roads.

7.11.3 There will be long term moderately significant benefits to the improvement of public access.

- 7.11.4 A comprehensive selection of thirty viewpoints was used as visual receptors including the five additional long distance viewpoints requested by LDC and English Heritage. There were no significant visual impacts during construction, completion or 20 years after mitigation on any of these visual receptors. Thirteen viewpoints will experience moderately significant adverse visual impacts during the construction period, this being caused by views of the construction works, stockpiles, materials and lighting. A similar level of impact will be experienced on completion from these same viewpoints, as a result of views of new buildings, roads and lighting.
- 7.11.5 Mitigation includes a comprehensive landscape strategy for the site including the creation of district, town, riverside and local parks as well as a hierarchy of smaller open spaces within each neighbourhood. The existing vegetation pattern of wooded copses and hedgerows will be assimilated into the open space network, as practical, and complimented by new woodland planting and planted wildlife corridors, together with an enhanced management regime. This will provide either a reinforced wooded skyline in views from most of the selected viewpoints, or a perceived integration and softening of the built form of the proposals into their landscape setting.
- 7.11.6 In the long term, after the growth of planting, only eight viewpoints will continue to have moderately significant impacts. These adverse impacts are due mostly to direct views of the proposals from the edge of the existing employment area at Fradley Park, or where viewpoints lie close to the new link roads, A38 interchange and proposed park and ride.
- 7.11.7 Views at night are heavily affected by existing light sources, especially lighting of the hangar areas and adjoining Fradley Park warehouse and business park units. There are lighting columns on the primary road network including the A38 Hilliards Cross Junction and Wood End Lane. Together, the light sources create an extensive area of visible skyglow on the skyline. In common with other residential areas, new light sources within the development will be partly screened by the built form. They will be seen against the existing night-time glow of Fradley Park. The use of cut-off style lanterns within the park and ride, and along both link roads, will reduce the potential impact of the new highway infrastructure lighting. Accordingly, night-time impacts are assessed as not significant.
- 7.11.8 A swathe of existing agricultural land (the gap) has been retained between the northern edge of Lichfield (delineated by the railway line) and southern edge of the new development site. This will extend 1km in width, and be complimented by other land in open uses within the development boundary including the new district park and new structure planting areas. The width of the gap and the design of the southern boundary will provide a sense of separation and distinctiveness between Lichfield and the proposals.

7.12 Summary of Consultation Responses

Table 7.2 - Summary of Consultation responses

Consultee (date of correspondence)	Consultee Comment	ES Updated ES Response
1. LDC Greens and Open Spaces Officer (09.05.08)	District park should be more centrally located and its function / facilities clarified.	District park function and community facilities addressed in RPS master plan and DAS, and illustrated on Figure 10.5: Appendix C.4. Landscape Master Plan.
	Insufficient information provided on management of POS infrastructure. Big and Little Lyntus are important for their ancient woodland status.	Landscape Management Framework in Appendix C.16 expanded to include description of management options, which will be addressed by S106 Agreement.

Consultee (date of correspondence)	Consultee Comment	ES Updated ES Response
	Development in northern site area Fradley Wood will result in loss of biodiversity; and woodlands further procured by recreational use.	Chapter 6: Ecology and Nature Conservation describes woodland mitigation measures.
2.LDC Arboricultural Officer (27.05.08)	Fragmentation of Fradley Wood and important hedgerows, loss of woodland contrary to Saved Structure Plan Policy NC13, Saved LDC Policy E3 and WMRSS Policy QE8. Formal open spaces and development should be moved away from edges of Fradley Wood, Big and Little Lyntus, because of vandalism and deterioration through increased pressure/usage by public.	Retention of better quality broadleaved woodland maximised, open uses and buffers adjacent to woodlands increased to 15m as suggested. Replacement planting designed to promote enhanced connectivity (see Appendix C.4: Figure 10.5: Landscape Masterplan and Appendix C.16 Landscape Management Framework). Policy matters are addressed Chapter 5: Planning Policy.
	Climate change needs more consideration in terms of contribution of open space and tree planting to urban cooling, and conservation of existing woodland.	Trees / woodland will act on carbon sinks. Significant new structure planting is proposed. Further details of urban/landscape design strategy (e.g. street trees) given in RPS DAS.
3. LDC Countryside Officer (30.05.08)	Development in north of site inappropriate because of impact / pressure on woodland. Details of buffers and protection measures to be submitted.	See Appendix C.4: Figure 10.5: Landscape Masterplan and Appendix C.16 Landscape Management Framework; comment as above.
4. LDC Conservation Officer (11.05.08)	Ensure protection of setting of Coventry Canal.	20m landscape buffer proposed between P&R and canal to reflect existing width of woodland belt (see section 7.9)
	The 'green wedge' intended to separate the proposal from Lichfield, will not be sufficient to make a distinct settlement.	1km gap maintained (see section 7.9)
5. SCC Countryside Unit	Green wedge (gap) reduced too much, pull development boundary away from Lichfield.	1km gap maintained (see section 7.9)
	Historic field boundaries could be restored or maintained.	Design of southern boundary further refined, and historic field boundaries reflected in new planting and road pattern as far as possible (see Appendix C.4: Figure 10.5:

Consultee (date of correspondence)	Consultee Comment	ES Updated ES Response
		Landscape Masterplan).
	Development in Fradley Wood inappropriate, could be mitigated by setbacks and planting.	Appendix C.16: Landscape Management Framework sets out buffers.
6. SCC Principal Ecologist (29.04.08)	SCC Planning for Landscape Change LCA to be used: Trent Valley Washlands, Settled Heathlands; and Cannock Chase and Cank Wood, Settled Farmlands character types. How will landscape design / mitigation contribute to policy objective for area.	Requested LCA types referred to (see section 7.9).The landscape mitigation strategy seeks to enhance landscape character, as practical.
	Proposal does not comply with Policy NC2 as loss of landscape elements that contribute to local distinctiveness, and introduction of incongruous elements (e.g. Park and Ride).	Retention of hedgerows/woodland maximised. Refinement of southern edge proposals to reflect historic and extant landscape boundaries, and provide increased connectivity within framework of existing/new vegetation to restore landscape pattern and enhance wildlife movement corridors.
	Avenue containing vista to Cathedral not in keeping with irregular field pattern and does not reflect aims of Policy QE1.	Refer also to Chapter 5: Planning Policy.
	Agrees there will be no significant visual/landscape impact north of Wood End Lane. Extensive development footprint and secondary / tertiary road links will have detrimental impact on gap. Lighting impact on LCA south of Wood End Lane understated.	
	Requests photomontages	RPS have produced CAD generated views/models to illustrate development [confirm with RPS]
	Greater stand-offs from development required adjacent to woodland.	See Appendix C.4: Figure 10.5 Landscape Masterplan and Appendix C.16:Landscape Management Framework; comment as above.

Consultee (date of correspondence)	Consultee Comment	ES Updated ES Response
7. SCC Planning Policy Manager (13.03.08)	Application does not conform to Policies QE1 and QE6 because of impact of large scale development / new road links on landscape character and extension into gap.	Policy matters are addressed in Chapter 5: Planning Policy.
8. West Midlands Regional Assembly (09.05.08)	Application does not conform to Policies QE1 or QE6 because of impact of large scale development / new road links on landscape character and extension into gap.	Policy matters are addressed in Chapter 5: Planning Policy.
9. Forestry Commission (14.05.08)	Request 5.8ha loss of Fradley Wood mitigated by equivalent elsewhere on site, new planting capable of developing true woodland character. Big Lyntus is partly ancient and semi-natural woodland.	More woodland retained in Fradley Wood, significant new woodland and tree planting proposed, especially around Big and Little Lyntus (see Appendix C.4: Figure 10.5: Landscape Masterplan). New planting will be based on proven woodland mixes and represents greater hectareage than woodland lost to development (see Appendix C.5:10.6)
10. CABE (16.06.08)	Mature trees / hedgerows should be incorporated within the development, not green links.	It is generally accepted that existing / new planting is better managed within the public domain rather than on plot.
	Management of open space infrastructure will need to be clarified as LPA will not adopt.	Management mechanisms set out in Appendix C.16: Landscape Management Framework, and will be addressed through S106 Agreement.
11. Natural England (25.04.08)	Concern regarding to proximity of development to Big and Little Lyntus (both ancient woodland).	Development edge moved back, buffers increased, significant new linkage planting between woodlands (see Appendix C.4: Figure 10.5 Landscape Masterplan and Appendix C.16: Landscape Management Framework).
12. English Heritage (01.05.08)	Request wider assessment of historic setting of Lichfield, views to north and west (e.g. Pipe Hill and Abbots Bromley).	Wider assessment undertaken (see section 7.9)

Consultee (date of correspondence)	Consultee Comment	ES Updated ES Response
	Table 10.3 does not refer to historic related designations Coventry Canal mistakenly referred to as Conservation Area	Table 10.2 refers to historic designations found within study area e.g. listed buildings, conservation areas, historic features and designations are described further in Chapter 16: Cultural Heritage.
13. Inland Waterways Association (04.05.08)	A38 interchange should be better designed to reduce impact on Coventry Canal and include more substantial planting.	Rationale for interchange design and siting of P & R described in the revised Masterplan (submitted 2008), section 5.0 (Design Concept and Objectives) and 6.0 (The Masterplan).
	Location of P & R will damage rural setting of canal.	All areas available for new tree and shrub planting of A38 interchange, adopted as such within proposals. 20m landscape buffer proposed between 'Park & Ride' and canal, to reflect existing woodland belt.
14. British Waterways (28.04.08)	Details of species and planting locations to be agreed with BW.	Detailed proposals will be agreed as part of Reserve Matter applications.
	Opening up of vistas towards canal.	Existing Fradley Wood screen should remain intact. New newt reserve/POS with footpaths will enhance appreciation of Fradley Junction.
15. Lichfield Civic Society (14.05.08)	Question location of P & R	Rational for P & R location stated given in the revised Masterplan (submitted 2008), section 5.0 (Design Concept and Objectives) and 6.0 (The Masterplan).
	Concerned about future development pressure on gap, given transversed by two link roads.	Future of gap can be addressed by Policy Protection.

8. Hydrology and Water Quality

8.1 Introduction

8.1.1 In the previously submitted Environmental Statement (ES) and the accompanying Flood Risk Assessment (FRA) the potential impacts of the proposed development at Fradley/Curborough were assessed in terms of flood risk, hydrology and drainage related issues.

8.1.2 The site was found to be within flood zone 1, corresponding to 'little or no risk'; risks from groundwater flooding were considered low to moderate; overland flooding was considered a moderate risk; infrastructure failure flooding was considered to be low risk; surface water drainage systems would require further review to attenuate to a greenfield runoff rate of 5.0l/s/ha; concerns were raised regarding the capacity of the sewage treatment works to take foul water from the development; the potential for contaminated land was identified; no risks of flooding from adjacent land areas were identified.

8.1.3 The Environment Agency (EA) responded to the submitted ES and FRA documents in May 2008 with objections in relation to the FRA and foul sewage strategy and a suggested number of conditions applicable to contaminated land, SUDS and infiltration methods (to be subject to Local Planning Authority (LPA) consent). The EA also raised concerns regarding the ability of South Staffs Water to provide adequate water supplies to the proposed development.

8.1.4 Following receipt of these responses, a meeting was arranged (on 1st August 2008) between the EA and various Consortium Consultants to discuss the issues raised. The required areas of work are summarised below:

- Foul water disposal: further discussions were required with Severn Trent Water to clarify the capacity of the existing sewage system and to forecast whether extension/expansion of the works would be required for the development;
- Surface Waters / Flooding: Curborough Brook requires modelling of the floodplain extent to be overlain with the proposed Masterplan to ensure built areas are not subject to flood risk. The Mare Brook and Business Brook require some clarification statement over whether they flood or not to update the FRA;
- Provide correspondence from British Waterways confirming that the canals adjacent to the site are stable and level;
- Groundwater: flooding as a result of groundwaters was not recorded within the Fradley/Lichfield area. Site investigations should seek to identify the groundwater depth across the site. Due to varying sandstone/clay substrata percolation tests will be important to inform the drainage strategy of percolation method suitability;

- Drainage strategy: The use of SUDS must be considered as they are promoted not only for surface water attenuation but improved water quality benefits. Source control measures should be employed throughout the development and relate to designed sub-catchments within the development. Comments should be made regarding the continued maintenance of lakes/swales;
- Construction: surface water and flood control during construction should be considered, particularly in regard to soil erosion and wash off;
- Phasing: The two areas of attenuation lakes should be delivered in the first phase of the development and this should be identified in the strategy;
- Water supply: formal clarification of available water supply should be sought from South Staffs Water; and
- Pollution Prevention Statement: required for conformity with good practice and PPS23.

8.1.5 Related figures are contained within Appendix D of this document.

8.2 Fluvial Flood Risk

- 8.2.1 Sections 11.4.9 to 11.4.15 of the original ES discussed the potential flood risks from fluvial systems using EA flood map zones and concluded that the risk of fluvial flooding was 'low' as all the built development area would be within flood zone 1.
- 8.2.2 The accompanying Level 2 FRA was prepared in March 2008 to inform the ES and to address PPS25 issues of potential flooding from all local sources of flooding. It identified through data gathering and consultations with the EA that there were potential localised floods within the floodplain areas of Curborough and Mare Brooks (Section 4.1.3 original FRA). Therefore, no development would be proposed within these floodplain areas that could otherwise be retained for green space and habitat enhancements.
- 8.2.3 The Environment Agency reviewed the FRA in May 2008 (Reference – UT/2008/103670/01-L01) and requested during a subsequent meeting that the FRA investigated the fluvial flood risk through the development of a hydraulic model for Curborough/Pyford Brook to identify any flood risks within the proposed development boundaries. Figure 11.a in Appendix D, details the hydraulic modelling undertaken and a brief outline of the main findings are detailed below, whilst Figure 11.b in Appendix D depicts the flood zones identified for Curborough/Pyford Brook overlain with the nearest buildings (as outlined in the revised Design and Access Statement).
- 8.2.4 The Curborough/Pyford Brook does not have any gauged flow data, therefore further topographical surveys were conducted and Digital Terrain Mapping was obtained to develop the HECRAS (Hydrologic Engineering Centres River Analysis System) hydraulic model. The hydrological analysis used the FEH (Flood Estimate Handbook) as an overarching approach while considering additional methods to more fully understand the hydraulic situation (details explained further in the main report). Data was used to determine design flood flows and inundation areas for the 1 in 100 year flood (plus 20% for climate change) and 1 in 1000 year flood events. The data for the 1 in 100 year event was also used to inform the proposed drainage discharge location and the proposed minimum floor levels for development buildings as well as to assess potential

affects of flooding on any proposed, nearby surface water attenuation systems. Other aspects of the model were used to inform potential management issues along the Curborough/Pyford Brook systems in respect of the proposed development.

- 8.2.5 The model demonstrated that Curborough/Pyford Brook does not pose a significant risk to the development site during either a 1 in 100 year event (+ climate change) or a 1 in 1000 year event. The majority of the development area is therefore within flood zone 1, with little or no risk of fluvial flooding; areas within flood zone 2 are not planned for buildings but will be left as undeveloped, wildlife or green spaces.
- 8.2.6 The estimated flooding areas along the brook are detailed in Appendix D – A.3 of the Hydraulic Model Build and Validation Report – Figure 11.a in Appendix D). When the proposed locations of nearby buildings are superimposed upon the flood zone mapping, it can clearly be seen that all buildings are at least 50 metres away from the 1 in 100 year flood zones, as shown in the diagram for Figure 11.b (in Appendix D)
- 8.2.7 The flood zones shown to the east of the modelled brook (outside the development area) are indicative only as topographical data was not available for this area.
- 8.2.8 Flow sensitivity tests for the area have revealed that water levels in Curborough/Pyford Brook around Stowe Pools and between the Trent & Mersey Canal to Alrewas Hayes Farm are more sensitive to changes in channel roughness (i.e. encroachment of vegetation into the channel area could lead to reduced flow conveyance within these reaches).
- 8.2.9 Recommendations from the model include:
- Maintenance within Curborough/Pyford Brook to ensure debris does not block structures local to the site as this would increase the risk of flooding at the site;
 - Finished floor levels of buildings within the development area should be built to a minimum height relevant to those given in Table 6.6 (Appendix D –Figure 11.a) for different site areas, plus an additional freeboard of 600mm;
 - The development should avoid altering the existing, natural floodplain structure. If the proposals were to change or ground levels be altered, the loss of floodplain storage volumes must be compensated for on a 'like-for-like' basis in terms of volume and quantity within specified elevation bands (following Environment Agency guidelines and Planning Policy Guidance Note 25);
 - The drainage strategy for the site should also promote the use of Sustainable Urban Drainage Systems (SUDS) to maximise source control through infiltration and attenuation and minimise the impact of urban development on the current hydrological regime; and
 - At detailed design stage, the proposed drainage discharge location must be designed to accommodate flow levels during a 1 in 100 year (+ climate change) event and be set to cope with a water level of 57.16m Above Ordnance Datum (AOD) (located at Hay End Lane Road Bridge).
- 8.2.10 As shown in the Masterplan, all development will be built sufficient distances away from Mare Brook and Business Brook to avoid risks of flooding (e.g. minimum of 8-10 metre distance with green spaces between the brooks and buildings). The attenuation ponds will also be located a similar distance from the Mare Brook to avoid direct flooding interaction between the brook and the ponds. Specific details of ponds and building locations will be finalised in the detailed design.

8.3 Groundwater Flooding

- 8.3.1 The original FRA (Sections 4.2 and 5.1) and the original ES (Sections 11.4.16) found the site to be of 'low' to 'moderate' risk of flooding from groundwater, given the recorded local geology of the site.
- 8.3.2 These documents also highlighted the fact that further geological studies and ground investigations would be required to fully understand the drainage implications for the site and the development (original FRA Section 5.1.2 and original ES Section 11.4.17).
- 8.3.3 Ground investigations will take the form of groundwater depth testing and 'percolation tests' that will strategically assess areas of different geological character within the development site to measure rates of drainage and the potential influence of groundwater flooding. These will be conducted as part of, and to inform, the detailed design phase of the development. This information will be used not only to inform the drainage strategy for the development but also to inform the overland flood risks and dictate the suitability of surface water 'source control' designs where infiltration techniques for SUDS could be incorporated in various development areas and whether alternate surface water management strategies will be required.

8.4 Assessment of infrastructure failure and flooding

- 8.4.1 Section 11.7.1 of the original ES and Section 4.5.1 of the original FRA discussed the risk of flooding from infrastructure failure was considered low due to local topography and the good condition and maintenance status of the existing infrastructure (canals).
- 8.4.2 In terms of structural condition of the canal systems, correspondence has confirmed that British Waterways (BW) are not aware of any instances of flooding or overtopping from the canal reaches adjacent to the site.
- 8.4.3 The canal structure is made up of brickwork, steel piles and natural banks which are in a serviceable state of repair at present for British Waterways use, though sections of the offside canal (the side without a defined towpath) may not be owned by British Waterways so they cannot comment on the state of these sections.
- 8.4.4 All works that may affect British Waterways' property should adhere to the requirements outlined within the BW Code of Practice documentation.
- 8.4.5 Correspondence from British Waterways regarding these issues is included in Figure 11.C (in Appendix D) and further BW issues relating to the Curborough site are also detailed in the Updated Service Report. If reaches of the canals within the development area are not owned by British Waterways, further enquiries would be needed to identify, contact and liaise with the relevant landowners.

8.5 Surface Water Drainage Strategy - SUDS

- 8.5.1 Chapter 11 of the original ES (Hydrology & Water Quality) and the accompanying FRA discussed that the principles of reducing the potential overland flood risk and the reduction of potential surface water pollution entering the local watercourses would be addressed as far as practicable through the use of Sustainable Urban Drainage Systems (SUDS). The Design & Access Statement also discussed the use of environmentally sensitive drainage as a design principle.
- 8.5.2 To further promote the implementation of SUDS practices as part of the development process for Curborough, the following text has been constructed to outline how SUDS will be implemented throughout the detailed design stage, subject to obtaining further information regarding ground conditions and finalised site layout.
- 8.5.3 The impacts of surface water drainage from impermeable areas of the Curborough development will be controlled and managed to reduce the risk of flooding and control pollutants, whilst maximising the principles of more natural drainage mechanisms and cycles across the site and improve amenity benefits.
- 8.5.4 Impermeable areas within the proposed development include roads, pavements, car parks, playgrounds and roof areas of residential buildings, industrial units, schools and offices. Runoff from all of these areas could affect the quantity and quality of water entering local watercourses by carrying sediments, synthetic particles, litter and a wide range of soluble pollutants (e.g. hydrocarbons from fuel and vehicle exhausts).
- 8.5.5 Flood risk and water quality management of surface waters will be achieved through incorporating, wherever possible, SUDS, which are designed to manage surface water by retention, attenuation and infiltration. An increasing range of SUDS designs and applications are widely used in modern development strategies. For example, soakaways, permeable pavements, swales and infiltration trenches, wetlands, ponds, storm water attenuation systems, green roof systems, rainwater harvesting and even the use of household water butts.
- 8.5.6 Throughout all design stages and linking across many different aspects of the development, the use and incorporation of SUDS will be applied at all appropriate locations across the site, and, where appropriate, follow other pollution control structures such as oil interceptors and silt traps.
- 8.5.7 Designs will apply the main principles of the 'SUDS Management Train' to maximise the control and treatment of water at its first point of contact with the ground within the site (source control) and continue to manage surface water flows across the larger site catchment (site control). This should improve the management of water flows leaving the development area and entering receiving watercourses or other treatment systems (regional control).
- 8.5.8 Section 4.3 of the FRA modelled various overland flood risks that could be generated from the development and demonstrated that the maximum estimated surface water volume of 85,000m³ generated by the development could be managed by using recommended SUDS designs.
- 8.5.9 The development area of the proposed Curborough expansion has been designed with several specific types of land use in certain areas of the site. This 'subcatchment' design for different land uses will allow for the design and implementation of specifically appropriate SUDS with targeted source control measures that are designed to link, where appropriate or necessary, to larger site control strategies.
- 8.5.10 The Design and Access Statement detailed various sub-catchment areas within the site, as determined by proposed land use, settlement character or by population density parameters (see drawings ACD5257.14.1, ACD5257.14.8 and ACD5257.14.6), along with proposed development phases (ACD5257.14.11), each of which will be reviewed with regard to surface water control, treatment and management. The ES also discussed sub-catchments A to D in terms of schools and open spaces; residential and roadway areas, depending on potential discharge areas and subject to separate discharge consents (Section 11.13.9 onwards).

- 8.5.11 Each phase of the various development sub-catchments will be reviewed in terms of site information and data, masterplan reviews, hydraulic and water quality requirements, feasibility assessments for all stages, conveyance linkages between sub-catchments and future operation issues to ensure hydraulic, water quality, amenity and ecological requirements are addressed (following principles outlined in the SUDS Manual (CIRIA c697).
- 8.5.12 As part of the SUDS design process, account must be made for existing local factors such as the geology and ground conditions (Section 12.8 of the original ES), the natural drainage character (Sections 12.9 and 12.10 of the original ES), existing soil or water-borne pollutants (e.g. historical MOD use of the site (Section 12.7 of the original ES)) and current water drainage functioning (Section 11.4 of the original ES).
- 8.5.13 In addition, SUDS designs should incorporate principles of safety, compatibility with other proposed structures (e.g. buildings and pipelines, both above and below ground) and potential new sources of pollution (e.g. traffic-related pollutants, litter, other waste waters not sent to sewer). This will ensure that all opportunities for SUDS are investigated and wherever possible, effectively utilised.
- 8.5.14 Much of the information required to plan and design effective SUDS will not be available until later in the development process. Detailed, specific surveys, ground work and ground investigations will be required to inform other aspects of the development (e.g. percolation tests for groundwater interactions, further geological studies required for land use and geological information, soil assessments for potential contamination). Section 3.3.8 of the original FRA discussed the need for further geological investigations to be conducted at the detailed design stage to identify constraints or opportunities for the inclusion of suitable SUDS designs in the development.
- 8.5.15 SUDS designs that utilise infiltration techniques may not be appropriate within some parts of the site (both from a geological and a contamination perspective), but this can not be clarified until tests have been carried out as part of the detailed design stage.
- 8.5.16 SUDS designs will also need to be reviewed alongside the detailed infrastructure designs to ensure compatibility and functional success.
- 8.5.17 A few of the examples that will be considered include 'green roof' designs that will be applied to schools and larger buildings within the Local Centre where structural requirements, safety and designs will allow. Swales (broad, shallow vegetated channels) will be incorporated where land space is sufficient along roads and adjacent to other paved areas. Water harvesting systems will be considered in high density, public or school areas (e.g. water butts for gardens and underground systems to augment WC supplies).
- 8.5.18 The concept of a 'SUDS Corridor' will be incorporated to allow for the conveyance of exceedence flows and make space for water. Permeable paving and drainage will be applied to appropriate parking areas and all designs will incorporate considerations for climate change and maintenance.
- 8.5.19 Several attenuation ponds will be constructed for controlling surface sediments and run off during construction phases and will form part of the continued SUDS management train after construction is completed, whilst also providing additional wetland habitat and amenity areas. The precise size and locations for these ponds will be given at the detailed design stage, but they will be located beyond the flooding zones of the adjacent watercourses (e.g. Mare Brook). Attenuation ponds will also be smaller in size than those shown in the Design and Access Statement (within the Site Wide Masterplan diagram), as additional SUDS techniques will be introduced across the site to reduce the size of attenuation ponds required to control surface waters prior to release into receiving watercourses.
- 8.5.20 The design, construction, adoption, ownership and maintenance of SUDS, such as those already mentioned, will be more fully incorporated as part of the detailed design phase of the Curborough Development. Design and implementation will be undertaken in accordance with recognised best practice and SUDS guidelines (e.g. PPS25: Development & Flood Risk (DCLG); PPS23: Planning

& Pollution Control (ODPM); Drainage of Development Sites (CIRIA/HR Wallingford); SUDS – A Guide for Developers (EA); The SUDS Manual C697 (CIRIA); Making Space for Water (DEFRA), DMRB Guidance - Volume 11 (Highways Agency)).

- 8.5.21 In addition, the ideas and principles of 'Making Space for Water' (as outlined by Defra and other Government departments since 2004 and 2005 and being strategically implemented by the Environment Agency through its SUDS Policy EAS/0102/1/3) will be adopted across the development area to minimise flood risk, maximise surface water and pollutant control.
- 8.5.22 Future management and maintenance will require further liaison with all stakeholders, STW, Lichfield DC, local businesses, schools and other potential private management schemes in conjunction with the Open Space management scheme, once the extent, location and designs of the SUDS are finalised for the detailed design. The maintenance and ownership issues will follow the guidelines for 'Model Agreements for Sustainable Water Management Systems and 'Model agreement for rainwater and greywater use systems' (CIRIA C626). This is particularly important as, for example, permeable pavements need regular cleaning to unblock pores or replacing every 8-10 years (Zhang, 2006¹) and underground stormwater chambers may need de-silting to continue to provide adequate surface water control across the site.
- 8.5.23 At this stage there is nothing to preclude the successful use and implementation of SUDS across the development site, provided ground conditions, sub-catchments and structural designs are reviewed alongside sustainable drainage concepts and designs.

8.6 Surface Water Control Strategy – Construction Phases

- 8.6.1 Section 11.13 of the original ES discussed the issues surrounding water quality of existing watercourses, canals and the impacts that the development could have upon their current status. Mitigation measures were discussed in Sections 11.13.23 to 11.13.26 of the original ES, including following Pollution Prevention Guideline practices during construction and considerations for residual impacts.
- 8.6.2 Further to these measures, the development will also seek to incorporate the principles of PPS23 (Planning and Pollution Control) and PPS25 (Development and Flood Risk). In addition, technical guidance will be sought from various other publications including the Site Handbook for the construction of SUDS (CIRIA c698) and Control of water pollution from constructions sites (CIRIA SP156 & C532).
- 8.6.3 Throughout the development and construction phases, the control of surface waters and mobilised sediments will be carefully reviewed and preventative measures strategically developed to minimise exposed sediments, reduce the risks of flooding and prevent pollution of receiving watercourses. Three main phases of development will include secondary and tertiary access links; secondary school and park and ride areas; mixed use Local Centre developments (see Design & Access Statement - Phasing Parameter Plan diagram ACD5257.14.11).
- 8.6.4 Localised areas of ground disturbance will be reviewed with each proposed phase and area of construction to assess how surface waters and potential sediment release, or pollutants will be controlled, both on a small, localised scale and on a larger, site-wide scale.
- 8.6.5 Through modelling of the floodplain and associated streams (as already undertaken as part of the FRA and currently being reviewed for a further section of the Updated ES and mentioned in Section 8.2 above –this document), attenuation pond systems can be incorporated in the early detailed design stages, located in areas not already subject to local flooding. This will serve to reduce and control surface water quantities and quality as a priority within the first phase of

¹ Zhang, J (2006) A laboratory scale study of infiltration from Pervious Pavements. Thesis for Master of Engineering, RMIT University, Australia.

construction works and such approaches will be applicable or adapted for the construction phases that follow.

- 8.6.6 Sediment basins and traps, buffer strips, swales, soakaways, bunds and interception channels will be constructed to manage surface waters across the site during the establishment of each construction phase, depending on ground conditions and area characteristics.
- 8.6.7 Protection zones where there should be no or minimal disturbance by construction will be identified. Careful planning for the timing of works, storage of materials and remedial works once works are completed will form an important part of the detailed design stages.
- 8.6.8 Post-construction, the attenuation ponds and lakes will be re-assessed and, where possible, enhanced to provide wetland habitats and improve local biodiversity within the new development area, whilst maintaining their effective role as surface water attenuation systems as part of the SUDS management across the site.
- 8.6.9 The maintenance and ownership issues will follow the guidelines for 'Model Agreements for Sustainable Water Management Systems; and Model agreement for rainwater and greywater use systems' (CIRIA C626). See also comments in Section 8.5 above (this document).

8.7 Foul Water Drainage System

- 8.7.1 Section 11.7.5 of the original ES discussed concerns regarding the ability of the sewage treatment works to accept the additional flows generated by the proposed development.
- 8.7.2 Further consultations, though both phone calls and e-mail contact, have since been carried out with Severn Trent Water (STW) to identify key stages in the development that will affect the use of the current sewage treatment works capacity.
- 8.7.3 It has been established that the existing sewage treatment works will not be able to accommodate the foul water from the proposed development at Curborough and will require upgrading and/or extension. Severn Trent Water has a legal obligation to accept any and all domestic waste water flows, including schools, houses and small (non-industrial) premises. Additional capacity to deal with increased flows will be provided at expense to Severn Trent Water and they will monitor the progress of the proposed development to ensure that capacity is provided when required. Continued liaison between the developer, consultants and Severn Trent Water will facilitate the process.
- 8.7.4 It would, however, be the developer's responsibility (and cost) to provide 'transport' of foul drainage waters from the development to the appropriate sewage treatment works. Certain other water users of the development would need to agree discharge processes with Severn Trent Water to allow the release of foul waters into the drainage system to the treatment works (e.g. swimming pool water would need de-chlorination before being discharged to sewer, laundrette owners would require consent).
- 8.7.5 Further information regarding foul water systems for the Curborough proposed development, with regard to potential costs for diverting existing foul drainage systems and easements for existing infrastructure are detailed in the Updated Services Report.

8.8 Water Supply and Water Use

- 8.8.1 Further to the queries raised by the Environment Agency (EA) in its correspondence dated 8th May 2008 (following the review of the EA and FRA) and following the meeting between the Consortium's Consultants and the EA on the 1st August 2008, the EA requested formal clarification be sought from South Staffordshire Water (SSW) regarding its available water supply to serve the development.
- 8.8.2 SSW has confirmed (during a telephone conversation between Atkins and SSW on 8th September 2008) that they are legally obliged to supply water to all domestic dwellings. However, as previously indicated in the Atkins Services Report (dated March 2008) there is insufficient capacity of the current network to supply water to the development. Upgrading of the network will be required, but at this stage, they are unable to provide any other information than that previously provided and reported in the Atkins Services Report. Budget cost estimates to upgrade the network can be obtained from SSW once detailed proposals, site layouts and loadings for the scheme have been developed as part of the detailed design stage.
- 8.8.3 Comments regarding the movement of existing infrastructure to accommodate the development proposals are detailed in the Updated Services Report.
- 8.8.4 Water use issues will be considered during detailed design stages to address quantities of water that the development will consume and any methods that can be incorporated to promote the efficient use of water resources across the site. The promotion of water efficient designs and facilities within domestic, commercial and educational buildings will be considered and applied as appropriate to the function of each structure.

9. Land Use, Geology and Soils

9.1 Introduction

- 9.1.1 Following the submission of the original ES, queries were raised by the County Archaeologist and Lichfield District Council regarding the potential for buried artefacts and the mineral deposits within the site, respectively. These are discussed further in Sections 9.2 and 9.3 of this report.
- 9.1.2 Related figures are contained within David L Walker report (Appendix E).

9.2 Archaeological Investigation

- 9.2.1 It is understood that buried artefacts of national archaeological importance may be present within the site and these may become disturbed or damaged during the intrusive investigation phase of the works. It is therefore recommended that an archaeologist be in attendance during the intrusive works. However, prior to the commencement of the works and to satisfy health and safety procedures, a non-intrusive geophysical investigation should be undertaken at the site to survey for buried ordnance, materials and artefacts. Those of interest can then be investigated further by a suitably qualified archaeologist.

9.3 Minerals Objection

- 9.3.1 Due to the presence of sand and gravel resources in the north of the site, where the main development is proposed and the close proximity of the site to Whitemoor Hay Quarry (approximately 2km northeast of the site) and Elford Quarry (approximately 1.4km east of the site), a holding objection has been raised by Lichfield District Council (LDC) under the recommendation of Staffordshire County Council (SCC).
- 9.3.2 The SCC have also confirmed that there are two areas of land currently being considered for surface quarrying in the preparation of the Minerals Core Strategy. Both proposed quarry sites are located within 1.4km north of the site.
- 9.3.3 Given these facts, SCC have requested that additional information regarding the implications of the development proposals on these mineral resources be provided. Further clarification would need to be presented on the quality and quantity of the mineral resources which have been identified beneath the site.
- 9.3.4 David L Walker Chartered Surveyors (DLW) (Appendix E) was commissioned in accordance with SCC's specific requirements to undertake a minerals survey. The minerals survey is within the David L Walker report (Appendix E). The report focussed on three main areas:
- The potential mineral resource available;
 - Viability of recovery; and
 - Mineral value.
- 9.3.5 A desktop assessment was undertaken utilising published literature in order to model the geology and assess the mineral resource for the site. The geology of the site is Alluvium old river gravels and river terrace deposits underlain by the Keuper Marl Series comprising mudstones (interbedded red and grey clays) and interbedded sandstones.
- 9.3.6 For the purposes of the report the site was split into three distinct areas, the locations of which are illustrated on plan C39/02 of the report.
- Area 1 – Land north of Wood End Lane;
 - Area 2 – Land South of Wood End Lane; and,
 - Area 3 – Land East of the A38.

- 9.3.7 The British Geological Society (BGS) borehole logs were interpreted during the review of the site specific geology for the areas of site outlined above. The locations of the boreholes are presented on plan C39/04 of the Mineral Assessment Report.
- 9.3.8 Nine borehole logs were sourced for Area 1. The interpretation suggests that the quality of deposit deteriorates to the east. The evidence presented in the borehole logs suggests an average of 4 metres of mineral may be present.
- 9.3.9 Area 3 was interpreted using seven boreholes which suggest that potential mineral deposits exist, DLW suggest that the mineral deposits would likely be to the north of Brookhay Lane. The evidence suggests the deposit should be relatively low in silt and an average mineral depth of 3 metres.
- 9.3.10 Four boreholes within the Area 2 suggest that there are no economic sand and gravel deposits south of Wood End Land and therefore no further discussion of Area 2 is made.
- 9.3.11 A recovery scheme was developed for Areas 1 and 3 for the resource assessment which is based on providing a theoretical extraction limit accounting for the following:
- Standoffs to boundaries and limits of extraction;
 - Proximity of roads, railways and canals;
 - Ecological areas of interest that area to be retained as part of the overall development;
 - Protected species including Bats, Great Crested Newts and Badgers;
 - Presence of former areas of working;
 - Location of residential amenity (i.e. Gorse Farm, Shade House and Spinney Cottage);
 - The presence of industrial units on site;
 - Presence of utility assets;
 - Location of public rights of way; and
 - Landscape and visual factors.
- 9.3.12 Within the vicinity of Area 1 are the existing areas of woodland planting including Fradley Wood, the bulk of which will remain undisturbed. Fradley wood and The Spinney are likely to remain undisturbed because of its ecological and landscape value. Areas of established woodland vegetation are likely to remain undisturbed because of their ability to act as a screen and in any event they will be retained under the overall proposals of Curborough. The surrounding roads and canals have the benefit of a standoff as do the residences at Gorse Farm and Spinney Cottage. Based on experience from other sand and gravel workings therefore the following stand offs apply.
- 20 metres off all Roads;
 - 25 metres off the canals;
 - 100 metres from Gorse Farm and Spinney Cottage;
 - 5 metres standoff from the access to Spinney Cottage;
 - 3m from areas of established vegetation and adjoining land outside the resource blocks;
 - Assumption is made that a 500 metre standoff is applied to the protected species on site; and,
 - Utilities and public rights of way can be diverted/stopped up so not to impact on any extraction operation.

- 9.3.13 Taking into account the parameters listed above, an extraction area of 11.4 ha was delineated.
- 9.3.14 The key factors within Area 3 are the A38, the Coventry Canal, Hilliards Cross Farm and Podmore. The following stand offs apply to the area:
- 50 metres from the A38;
 - 100 metres from Hilliards Cross Farm and Podmore;
 - 20 metres from Brookhay Land; and;
 - 15 metres Coventry Canal.
- 9.3.15 After taking into account the parameters listed above an extraction area of 11.4ha was delineated.
- 9.3.16 Resource Estimations were undertaken using isopachytes along with the mean thickness for verification. A tonnage factor of 1.65 tonnes/ cubic metre was used in the estimates. No grading analyses were available thus DLW assumed a conservative 15% silt percentage within sand and gravel resources.
- 9.3.17 An estimated tonnage has been derived as 990,000 tonnes and 543,657 tonnes respectively for Areas 1 and 3. Assuming a loss of 15% due to silt content a potential saleable mineral reserve of 870,000 tonnes and 460,000 tonnes for Areas 1 and 3 is estimated.
- 9.3.18 Following a review of the revised Master Plan, the areas of mineral resource derived, were then used to calculate the potential impact on the Curborough development principally within Area 1. The calculations excluded from these calculations were recreational areas (football pitches and play areas) and amenity areas (ponds and retained woodland). With regard to Area 1 a total of 1.7 ha would become sterilised due to the presence of the school. This would result in approximately 160,000 tonnes of mineral resource to be sterilised if not extracted prior to construction of the school.
- 9.3.19 DLW advised maximisation of the recovery of any resource, and needs consideration to be given to working the mineral before the development is built. This is dependent on a number of factors which include:
- the availability of on-site materials for restoration;
 - given that groundwater being relatively high restoration will need to be close to existing levels for the development; and;
 - availability of suitable materials to be imported (if required)
- 9.3.20 These measures are likely to result in substantial modification to the revised Master Plan and thus further delay in releasing the land for development. It is understood that there is scope within the scheme for the sand and gravels to be used in connection with the project.
- 9.3.21 The report reviews the planning policies outlined in the following documents:
- Staffordshire and Stoke on Trent Minerals Local Plan adopted December 1999,
 - Staffordshire and Stoke on Trent Joint Structure Plan adopted May 2001,
 - The Emerging Staffordshire Minerals and Waste Development Framework,
 - Relevant National Policy and other material considerations.
- 9.3.22 Attention is drawn to Section 5 of the Mineral Assessment Report which includes a discussion of planning policies. In summary given the current landbank situation within the county, the mineral deposits within Area 1 in particular could not be developed as a stand alone quarry within the next five years. The council has identified 24 potential sand and gravel sites with an accumulated resource of 153 million tonnes. Of this figure, only 49 tonnes is required to sustain the landbank through until 2019, this takes into account the preference for extensions (Alrewas south for

example) and the known location of bigger reserves at new sites such as Wychnor. It is suggested by DLW that the deposits at the site are unlikely to progress beyond the Preferred Options stage of the Site Allocations Core Strategy Development Plan Document for the Minerals and Waste Development Framework. It is concluded that the mineral resource at the site is unlikely to become economically significant unless the resources within Areas 1 and 3 are used specifically within the Curborough project.

- 9.3.23 DLW also consider that there is scope to utilise the Council's known acceptance of borrow pit polices in given areas of site to recover the mineral deposit identified within Areas 1 and 3. The mineral deposit in Area 1 in theory could be used as the primary aggregate source for the Phase 1 development. A continuation of this sustainability is proposed and the use of on site batching plant would ensure proposals are consistent with local and national policies and provided the most environmentally sustainable means of balancing safeguarding versus extraction argument.
- 9.3.24 The environmental viability impacts of mineral extraction, would only be a temporary land-use over a short period of time, therefore the resulting impacts should also be classed as temporary. The mineral resource within Area 3 could be recovered within two years if operated at 250,000 tonnes per annum. Given the site setting of Area 3 and the projected scale of the operations it is considered by DLW that there are no environmental limitations to the scheme and those that have potential issue can be mitigated against throughout the duration of any development.
- 9.3.25 Area 1 has a larger deposit, which in turn would require a larger scale operation over a longer duration, resulting in a wider range of environmental implications. The demand for the mineral would be established as part of the development of Phase 1. DLW consider that the environmental impacts of the mineral workings would be significant for landscape, ecology and amenity impact (i.e. noise and dust). The report addresses each environmental impact in turn within Section 6.
- 9.3.26 The present market value of each area has been calculated by DLW, in accordance with the RICS Valuation Standards Sixth Edition (Red Book). The present market value of Areas 1 is £300,000 and Area 3 is £300,000 (as at December 2008), on the basis that a satisfactory planning permission is obtained in the next 5 to 10 years. Any impacts could be minimised by utilising a borrow pit principle which would provide the most environmentally acceptable and sustainable means of reducing the amount of mineral sterilised by the proposed development at Curborough.
- 9.3.27 Within Area 1 the valuation does not take into account the potential ecological mitigation and/or translocation costs, which are believed to be in the region of £100,000. No figures for archaeological costs are given, or figures for felling timber costs, these are assumed to be undertaken, if necessary, on commercial basis.
- 9.3.28 If both areas had satisfactory planning permission and were readily available to be worked DLW suggest that the values of the areas could be in the region of £800,000 and £500,000 respectively.

10. Cultural Heritage

10.1 Introduction

- 10.1.1 This section re-assesses the likely effect of the implementation of the proposed development on cultural heritage in terms of archaeology, built heritage and Historic Landscape Characterisation, in the light of the revised masterplan. The likely impacts are re-assessed during both the construction and operational phases of the proposed development.
- 10.1.2 The aims of this study are to re-assess the likelihood of the proposed development site and study area to contain remains of cultural heritage significance and to provide an indication of what, if any, further work may be required with regard to mitigation in the light of the revised masterplan.
- 10.1.3 The objectives of the post submission work leading to this Updated ES have been:
- to identify and assess the relative importance of cultural heritage features likely to be affected by the proposed development;
 - to protect those features through the avoidance of direct impacts where possible and to design mitigation measures to preserve those features by record where avoidance is not possible, and;
 - to protect the setting of cultural heritage features through both the design of the layout of the scheme and through measures such as planting

10.2 Planning Context

- 10.2.1 The planning context remains unchanged.

10.3 Methodology

Baseline Methodology

- 10.3.1 The methodology remains unchanged.

Consultation

- 10.3.2 Following the submission of the planning application, further consultation has been undertaken with the County Archaeologist LDC's Conservation Officer and English Heritage.
- 10.3.3 This has included receipt of comments on the application by English Heritage, LDC's Conservation Officer and the County Archaeologist.
- 10.3.4 English Heritage provided its consultation comments in a letter to LDC dated 1st May 2008. These indicated that liaison with the County Archaeologist and District Council Conservation Officers should continue and their advice should be sought. In addition, English Heritage indicated that the phasing, design and specification of tree and structure planting should be agreed with LDC's Conservation Officers, that English Heritage may commission a detailed assessment of the historic landscape of the wider area around Lichfield and that the indirect impact on the historic core of Lichfield should be considered through a link between the chapter on cultural heritage, the chapter on Transport (Chapter 6) and the chapter on socio economic issues (Chapter 14) – original ES document (March 2008).
- 10.3.5 The County Archaeologist provided consultation comments in a letter from Ali Glaisher, Principal Ecologist at SCC to LDC dated 29th April 2008. This letter noted that no further pre-determination field evaluation was required and that this issue could be secured through condition, that the retention of historic field boundaries within the proposed development, as proposed within the planning application was desirable and that historic airfield structures to be demolished should be recorded prior to this taking place. In addition, the letter noted that the proposed avenue to the

south of Wood End Road is not in keeping with the overall irregular character of the historic landscape in the area and would not reflect the aims of RSS policy QE1.

10.3.6 Following receipt of these comments, a meeting was held with the County Archaeologist on 31st July 2008. English Heritage was invited to the meeting but did not attend.

10.3.7 At this meeting, LDC noted that the Consortium was taking on board its concerns regarding cultural heritage. It emerged that SCC had made slight alterations to the Historic Landscape Character Assessment, which should be taken on board. In addition mitigation regarding the park and ride area should be reviewed in order to safeguard the historic interest of the Coventry Canal. Further information on the effect of the proposed development on the setting of listed buildings was requested.

Impact Methodology

10.3.8 The impact methodology remains unchanged.

10.4 Existing Conditions

Listed Buildings

10.4.1 Existing conditions are largely unchanged, although the Milestone, of late 18th century date is recorded as being located on the towpath of the Coventry Canal to the east of Bearshay Farm and listed at Grade II (HER number 14197) has been confirmed by British Waterways as surviving in situ.

Historic Landscape

10.4.2 An historic landscape assessment was carried out in connection with the proposed development and submitted as part of the ES. The assessment was based on information supplied by SCC. The assessment remains largely unchanged, with the exception of the area around Curborough House and Brownfield Farm, which has been reassessed by SCC as being the product of Piecemeal Enclosure. This was originally recorded as Fields: Small Irregular and is now recorded as Fieldscapes: Piecemeal Enclosure. The southern part of the settlement area and the northern part of the Secondary road link are located in this area.

10.4.3 The historic landscape character types (HLCT) were defined by SCC in its draft Historic Landscape Characterisation. There is currently no detailed information available from SCC on the ability of each HLCT to withstand change and the assessment is therefore based on the information currently available, desk assessment and site visits. The following paragraphs comprise SCC's original definition (Fields – Small Irregular) and current definition (Piecemeal Enclosure), with a comment on the ability of each HLCT to withstand change.

Fields - Small Irregular

10.4.4 SCC definition: Areas of small irregular fields that cannot be assigned to one of the other historic landscape character types. Includes small meadows, and closes that do not occur next to settlement boundaries.

10.4.5 Note on ability to withstand change: within the proposed development area, the ability of this HLCT to withstand change is medium.

Piecemeal Enclosure

10.4.6 SCC definition: refers solely to those areas which had previously been open arable fields from the medieval period onwards. These are identified through map evidence by the reverse 'S' or dog-leg morphology which indicate that the enclosure has followed the boundaries of the former medieval field strips. Piecemeal enclosure is a process which was carried out from the late medieval period (14th century onwards) through to the 18th or 19th century and in Staffordshire this process had begun by the early 16th century. This was carried out by means of informal, verbal agreements

between farmers who wished to consolidate their holdings (the individual strips spread across the open field system).

- 10.4.7 Note on ability of Piecemeal enclosure to withstand change: within the proposed development area, the ability of this HLCT to withstand change remains medium.
- 10.4.8 The revised masterplan shows that the avenue with a view towards Lichfield Cathedral will be planted in an irregular manner to break up the line and to blend the avenue with the remainder of the historic landscape.

10.5 Immediate Impacts

Immediate impacts on below ground archaeology

- 10.5.1 This section is unchanged.

Immediate Impacts on the Tertiary Road Link

- 10.5.2 This section is unchanged.

Immediate Impacts on the Secondary Road Link

- 10.5.3 This section is unchanged.

Immediate Impacts on the Hillards Cross Junction

- 10.5.4 This section is unchanged.

Immediate Impacts on the Park and Ride Site

- 10.5.5 This section is unchanged.

Immediate impacts on the new road joining the proposed development area with East Hill

- 10.5.6 This section is unchanged.

Immediate impacts on the Setting of Scheduled Ancient Monuments

- 10.5.7 The Manor House moated site at Streethay (HER number 03547, SAM number 21528) is located some 400 metres south of the south-eastern part of the proposed development area. It comprises the remains of a single polygonal flat moated site, converted into a fish farm, according to the HER. The SAM is located in a similar location to that of the listed building at the Manor House. Revision to the masterplan has moved built development slightly further away from the SAM and the built part of the proposed development would be located some 770 metres from the SAM, while the proposed secondary road link would remain some 800 metres west of the SAM at its closest point. The immediate (unmitigated) impact of the proposed development on the setting of the SAM would be reduced but remain at minor adverse.

Immediate impacts on the setting of listed buildings

- 10.5.8 The Manor at Streethay (HER number 12559) dates from the early 17th century, with later alterations. It is listed at Grade II, as is the plunge bath associated with it. Revision to the masterplan has moved the built part of the proposed development slightly further away and it would now be located some 780 metres from the listed building and the proposed secondary road link would remain some 800 metres west of the listed building at its closest point. The immediate (unmitigated) impact of the proposed development on the setting of the listed building would be minor adverse.
- 10.5.9 Curborough Farmhouse (HER number 12466) dates from the early to mid-18th century, with some later alteration. It is a grade II listed building. Revision to the masterplan has pulled the development edge back from the listed building and the boundary of the proposed development area now would be located some 75 metres north of the listed building. The proposed tertiary road link would remain some 190 metres north-west of the listed building at its closest point. There may still be an affect on the building caused by dust and noise during construction. These effects

would be temporary and reversible and are dealt with in detail in chapters 7 and 8 (of the original ES). The immediate (unmitigated) impact of the proposed development on the setting of the listed building would be minor to moderate adverse.

- 10.5.10 The immediate impact of the proposed development on Brownsfield Farmhouse (HER number 12556) is unchanged.
- 10.5.11 The immediate impact of the proposed development on the Milestone located on the towpath of the Coventry Canal to the east of Bearshay Farm (HER number 14197) is unchanged.
- 10.5.12 The immediate impact of the proposed development on the farmhouse at Bluegates Farm (HER number 12561) is unchanged.
- 10.5.13 Lichfield Cathedral is listed at Grade I. The spire of Lichfield Cathedral is visible from the southern part of the proposed development area, and in places along the proposed secondary access road alignment, but most of the building is not visible from the proposed development area or the proposed secondary and tertiary link roads. There are no views of the proposed development area from the body of the cathedral, or from the Cathedral Close to the proposed development area or the proposed secondary and tertiary link roads. Revision to the masterplan has resulted in the southern edge of the proposed built development being moved away from the listed building and the immediate (unmitigated) impact of the proposed development on the setting of the listed building would be neutral.

Immediate impacts on the setting of Conservation Areas

- 10.5.14 The historic core of Lichfield contains the Lichfield Conservation Area within it. The built part of the proposed development would be located some 1,700 metres from the nearest point within the Conservation Area and the proposed secondary road link would be located some 800 metres east of the nearest point within the Conservation Area at its closest point. The historic core and Conservation Area is effectively screened from the proposed development area by the modern industrial development between the railway and the A5192 Eastern Avenue. There is unlikely to be any effect on the wider historic core of Lichfield, the Conservation Area or its setting. The immediate (unmitigated) impact of the proposed development on the setting of the Lichfield Conservation Area would be neutral.
- 10.5.15 There would be no change to the immediate (unmitigated) impact of the proposed development on the setting of the Trent and Mersey Canal Conservation Area, which would be neutral.
- 10.5.16 There would be no change to the immediate (unmitigated) impact of the proposed development on the setting of the Alrewas Conservation Area, which would be neutral.
- 10.5.17 Immediate impacts on Historic Landscape Character Areas
- 10.5.18 Piecemeal Enclosure: the southern part of the settlement area and the northern part of the Secondary road link are located in this area. The proposed development would preserve in part the field boundaries associated with this HLCA and the immediate impact on this HLCA within the proposed development area would be minor adverse.

10.6 Mitigation Measures

- 10.6.1 Mitigation measures may comprise avoidance of cultural heritage features through design, their preservation by record where this cannot be achieved and/ or measures to reduce or nullify the effect on the setting of cultural heritage features, usually where there is no physical impact, usually through planting.

Mitigation for below ground archaeology

- 10.6.2 There is no change to the proposed mitigation for below ground archaeology.

Mitigation for the demolition of airfield buildings

- 10.6.3 There is no change to the proposed mitigation for the demolition of airfield buildings.
Mitigation for the Tertiary Road Link
- 10.6.4 There is no change to the proposed mitigation for the Tertiary Road Link.
Mitigation for the Secondary Road Link
- 10.6.5 There is no change to the proposed mitigation for the Tertiary Road Link.
Mitigation for Hillards Cross Junction
- 10.6.6 The proposed mitigation for Hillards Cross Junction is unchanged.
Mitigation for the Park and Ride Site
- 10.6.7 With regard to possible below ground archaeology in the field to the north of the proposed Park and Ride site, the proposed mitigation is unchanged. The impact of the proposed development is likely to be minor. It is proposed in the first instance to carry out trial trenching along the line of the proposed road in this area to confirm this assessment. Depending on results, further mitigation may be agreed with the LPA through its archaeological advisors.
- 10.6.8 The revised site wide master plan illustrates a proposed scheme of increased structural landscaping around the Park and Ride site. This comprises further planting around the southern and south-eastern parts of the Park and Ride car park, further planting along the northern access road leading to/ from Brookhay Lane, to the north of the Park and Ride car park, further planting along the southern access road, west of the Park and Ride car park and east of the canal bridge north of Bearshay Farm, further planting around the traffic junction west of the canal bridge north of Bearshay Farm and further planting around the traffic junction on the west side of the A38 road.
- 10.6.9 It is intended that this scheme would further protect the setting of the listed milestone. In addition this scheme affords further protection to the setting of the Coventry Canal, which while having no statutory or other designation or protection, has been highlighted by LDC's Conservation Officer as being of interest.
Mitigation for the new road joining the proposed development area with East Hill
- 10.6.10 There is no change to the proposed mitigation for the new road joining the proposed development area with East Hill and no mitigation is proposed.
Mitigation for the Setting of Scheduled Ancient Monuments
- 10.6.11 There is no change to the proposed mitigation for the probable early Neolithic Causewayed Enclosure at The Sale (HER number 01337, SAM number Staffordshire 250) and no mitigation is proposed.
- 10.6.12 The proposed mitigation for the Manor House moated site at Streethay (HER number 03547, SAM number 21528) has altered, with the built part of the proposed development pulled further back from the SAM, to some 800 metres from the SAM. Mitigation will comprise the construction of three lakes in that part of the proposed development area closest to the SAM, with a scheme of planting around them. In addition, the secondary road link will have planting along its length to reduce its visibility in the wider landscape.

Mitigation for Impact on the setting of listed buildings

- 10.6.13 The Manor at Streethay (HER number 12559) is listed at Grade II, as is the plunge bath associated with it. The built part of the proposed development would be located some 810 metres from the listed buildings and the proposed secondary road link would be located some 800 metres west of the listed building at its closest point. Mitigation will comprise the construction of three lakes, with a scheme of planting around them in that part of the proposed development area closest to the listed buildings. In addition, the secondary road link will have planting along its length to reduce its visibility in the wider landscape.
- 10.6.14 Curborough Farmhouse (HER number 12466) is a Grade II listed building. Revision to the masterplan has moved the boundary of built development to some 75 metres north of the listed building. The proposed tertiary road link would remain some 190 metres north-west of the listed building at its closest point. Screening through a scheme of tree/ structure planting is proposed.
- 10.6.15 The proposed mitigation for Brownsfield Farmhouse (HER number 12556) is unchanged.
- 10.6.16 The proposed mitigation for the milestone located on the towpath of the Coventry Canal to the east of Bearshay Farm (HER number 14197) is detailed at the section on Mitigation for the Park and Ride Site (paragraphs 10.6.8 and 10.6.9). The proposed park and ride site would be located some 65 metres from the listed building, while the proposed new Hillards Cross Junction would be located some 140 metres from the listed building. Screening through a revised scheme of tree/ structure planting is proposed.
- 10.6.17 The proposed mitigation for the farmhouse at Bluegates Farm (HER number 12561) is detailed at the section on Mitigation for the Park and Ride Site (paragraphs 16.6.8 and 16.6.9). The proposed park and ride site would be located some 450 metres from the listed buildings, while the proposed new Hillards Cross Junction would be located some 850 metres from the listed buildings. The immediate (unmitigated) impact of the proposed development on the setting of the listed building would be neutral and no specific mitigation is proposed.
- 10.6.18 Lichfield Cathedral is listed at Grade I. The spire of Lichfield cathedral is visible from the southern part of the proposed development area, and in places along the proposed secondary access road alignment, but most of the building is not visible from the proposed development area or the proposed secondary and tertiary link roads. There are no views of the proposed development area from the body of the cathedral, or from the Cathedral Close to the proposed development area or the proposed secondary and tertiary link roads. The immediate (unmitigated) impact of the proposed development on the setting of the listed building would be neutral. Enhancement of the proposed development is proposed through the creation of a vista to Lichfield Cathedral. This vista will be planted in an irregular pattern to blend with the surrounding landscape.

Mitigation for Impact on the setting of Conservation Areas

- 10.6.19 The historic core of Lichfield contains the Lichfield Conservation Area within it. Revision to the masterplan has pulled the boundary of built development to the north, further from the historic core of the city. The built part of the proposed development would be located more than 1,700 metres from the nearest point within the Conservation Area and the proposed secondary road link would be located some 800 metres east of the nearest point within the Conservation Area at its closest point.
- 10.6.20 The historic core and Conservation Area is already effectively screened from the proposed development area by the modern industrial development between the railway and the A5192 Eastern Avenue. There is unlikely to be any effect on the wider historic core of Lichfield, the Conservation Area or its setting.

- 10.6.21 The immediate (unmitigated) impact of the proposed development on the setting of the Lichfield Conservation Area would be neutral. Enhancement of the proposed development is proposed through the creation of a vista to Lichfield Cathedral, itself located within the Conservation Area.
- 10.6.22 Mitigation proposals for the Trent and Mersey Canal Conservation Area remain unchanged.
- 10.6.23 Mitigation proposals for the Alrewas Conservation Area remain unchanged.

Mitigation on Historic Landscape Character Areas

- 10.6.24 Piecemeal Enclosure: the southern part of the settlement area and the northern part of the Secondary road link are located in this area. The proposed development would preserve in great part the field boundaries associated with this HLCA. In addition, tree and structure planting is proposed along the length of the secondary link road to soften the effect of the proposed development on the HCLA.

10.7 Residual Impacts

Residual Impacts on below ground archaeology

- 10.7.1 The residual impacts on below ground archaeology are unchanged.

Residual Impacts on the Tertiary Road Link

- 10.7.2 The residual impacts on the Tertiary Road Link are unchanged.

Residual Impacts on the Secondary Road Link

- 10.7.3 The residual impacts on the Secondary Road Link are unchanged.

Residual Impacts on Hillards Cross Junction

- 10.7.4 The residual impacts on the Hillards Cross Junction are unchanged.

Residual Impacts on the Park and Ride Site

- 10.7.5 In the field to the north of the proposed park and ride site, cropmarks, representing linear features and enclosures have been noted. The HER indicates that the features probably represent relatively recent changes to field boundaries (HER number 04090). A neutral to minor adverse residual (mitigated) impact is expected.

Residual Impacts on the new road joining the proposed development area with East Hill

- 10.7.6 The Residual Impacts on the new road joining the proposed development area with East Hill are unchanged.

Residual Impacts on the Setting of Scheduled Ancient Monuments

- 10.7.7 The Residual Impacts on the Setting of Scheduled Ancient Monuments are unchanged.

Residual Impacts on the setting of listed buildings

- 10.7.8 The residual impacts on the setting of listed buildings are unchanged.

Residual Impacts on the setting of Conservation Areas

- 10.7.9 The residual impacts on the setting of Conservation Areas are unchanged.

Residual Impacts on Historic Landscape Character Areas

- 10.7.10 The residual impacts on Historic Landscape Character Areas are unchanged.

10.8 Conclusion

- 10.8.1 A re-assessment of the proposed development following the submission of the planning application and further consultation has indicated that there are a number of cultural heritage receptors in the area. These receptors are wide ranging both in terms of time-depth and spatial layout (these receptors are not additional to those that were identified in the original ES).
- 10.8.2 The potential impacts on cultural heritage receptors have been re-assessed and suitable mitigation measures, some involving fieldwork, others involving design measures, outlined, where these have changed.
- 10.8.3 There are no statutorily designated sites (e.g. Scheduled Monuments, Listed Buildings) within the application site and there will be no physical impact on any such site through the proposed development.
- 10.8.4 The effects, if any, on the setting of cultural heritage features have been re-assessed, addressed and suitable mitigation measures, either in the form of avoidance by design and/ or screening, usually through planting, proposed.
- 10.8.5 Residual, mitigated impacts on cultural heritage features are assessed as being no greater than minor adverse and in many cases are re-assessed as neutral.

11. Socio Economic Factors

11.1 Introduction

- 11.1.1 This section is intended to assist an understanding of the effects of the proposed new settlement on the socio-economics of the wider area. These considerations are most commonly associated with the likely effects of the proposed development on the nature and characteristics of the existing population within close proximity of the application site. Given the nature and scale of the proposal, elements of the analysis will also assess the economic and social implications of the proposed development upon the wider area particularly in relation to Lichfield City.
- 11.1.2 A key objective of the proposal is to meet sustainable development requirements in terms of the site's specific context, taking account of local constraints and opportunities which exist. The primary consideration is for Curborough to be centred round the former airfield, maximizing access to the existing and expanding employment area to create a sustainable, inclusive and mixed community. Related to this, the proposals seek to minimise the amount of travel needed for residents in the new settlement and between it and Lichfield, as well as maximizing the potential for walking and cycling and use of enhanced public transport provision.
- 11.1.3 Representations have been made suggesting the proposals are deficient in excluding an area for Class B1, B2 and B8 uses within the settlement and that the case for linkage between new homes in the settlement and employment opportunities at Fradley Park has not been made.
- 11.1.4 This section seeks to explain the proposed linkages between the employment location of Fradley Park and the proposed settlement, explaining why no new Class B employment sites are included within the proposed development. The provision of public open space, community facilities and the delivery of educational establishments has been negotiated with the appropriate bodies prompting revisions to the outline proposal and Illustrative Masterplan. In order to provide a sustainable community a key factor has been to ensure that the settlement will achieve an appropriate level of self-sufficiency and not overload existing facilities within Lichfield or surrounding villages. Therefore, this Chapter relates to how the provision of facilities has been amended to meet the proposal's anticipated requirements in response to consultee submissions.

11.2 Employment

- 11.2.1 From the projected population produced by the development at completion, and taking into account the employment rate of the district (70%) and the district average of 28.5% skilled and semi-skilled manual workers as a proportion of the working population (source 2001 Census), the new settlement is expected to accommodate approximately 8,600 working adults overall, of which at least some 3,500 would be skilled and semi-skilled manual workers. The proportion of these workers may indeed be greater in the context of the affordability of the new homes generally and also their proximity to major employment areas in the A38 corridor. In addition, the A38 corridor employment areas, principally Fradley Park, will also offer a wide range of professional and managerial as well as support sector jobs which will match the skills of other working age residents of the development.
- 11.2.2 This evident source of potential employees, delivered through the phased build out of the settlement, would go some way to satisfying the current and future employment needs generated by Fradley Park and the other office, industrial and distribution parks located off the A38. It is also recognised that the level of skilled and semi-skilled workers accommodated may be higher than this figure as a result of the substantial amount of affordable homes being provided in Curborough.
- 11.2.3 The last decade has seen more than twenty national and international companies take development space at Fradley Park, located off the A38 to the north of Lichfield and directly adjacent to the application site. The park now employs 3,500 people (approximately) in offices

and the distribution/warehousing activities. The next phase of the park intends to invest more than £3.5 million in infrastructure to improve the local highway network whilst developing a further 69 hectares. Therefore, it is considered that the employment generation of Fradley Park, Lichfield City and the other office and employment parks along the A38 will provide approximately 3,000 further employment opportunities for the working age population of the settlement. No further employment sites are identified through the proposal other than those relating to the proposed education establishments and Local Centre which as set out below are estimated to total about 1,000 full time equivalent jobs. Additional employment land at the new settlement is considered not to be required and could conflict with the delivery of planned development at Fradley Park, resulting in oversupply of employment uses in one location.

- 11.2.4 The extent of employment land provided by Fradley Park and taking account of its future expansion is considered to be adequate to serve as an employment quarter for the proposed settlement as originally intended by previous Structure Plan Policy. As a result of this new settlement proposal, Fradley Park will no longer appear as an isolated business location, but amalgamate with the proposed community as a single entity.
- 11.2.5 It is anticipated that employees based at Fradley Park and other business locations off the A38 would be attracted to the proposed settlement as a place of residence due to the existing high level of commuting to work that takes place and the provision of an alternative to the housing market of Lichfield City. Apart from providing the opportunity for employees to live close to their place of work, the settlement will provide a proportion of affordable housing with varied housing tenures alongside an increased supply of housing within the area that will represent an alternative housing market to the nearby City with the ability to provide a more competitive rental market. This will go some way to reducing existing commuters' dependency on travel by car and address the lack of choice for single households and first time buyers to enter the housing market and rental sector. The new settlement will provide a genuine solution to these barriers through the delivery of a large addition to the housing stock, with a choice of dwelling type and tenure, and with access to a good range of local facilities and services.
- 11.2.6 To ensure that the settlement does not become a 'commuter location' in conjunction with Lichfield City, a number of initiatives will be formulated and implemented to market the new housing toward existing permanent employees based at Fradley Park and, when applicable, identifying rental properties for temporary or contract staff. To reinforce the links between the future resident population and the employment resources of Fradley Park, job vacancies will be advertised within the settlement to target the local workforce. This can be addressed effectively through planning conditions or planning obligation in parallel with a Travel Plan.
- 11.2.7 In response to concerns raised through the application's consultation process in respect of the contended lack of employment sites identified in the settlement, the proposed business premises included as part of the Local Centre have been expanded. As table 3.2 demonstrates, the amount of office space proposed has been increased so that 12 units are envisaged as well as 3 premises for financial services occupiers. The amended employment generating uses within the Local Centre therefore combine with the employment derived from the proposed leisure and educational facilities as follows:

Table 11.1 - Employment Generated

Proposed Use	Space per employee /sqm	Floor Area /sqm	Full Time Employees
A1 Retail supermarket	24	2500	104
A1 Retail Units	24	1200	50
A2 Financial Services	19	1500	79

Proposed Use	Space per employee /sqm	Floor Area /sqm	Full Time Employees
A3-A5 Restaurants Take Away, pub etc	33	1360	41
B1 offices	19	6000	316
D1 Public Services	17	2300	135
D1 Education	60	5,148 P/ 9,303 S	86P + 155S = 241
D1 Health Facilities	33	300	9
D2 Leisure	24	950	40
Total	-	-	1,015

11.2.8 The average employment densities illustrated in Table 14.1 are sourced from Staffordshire County Council's survey of Industrial Estates (SCC, 2006) and help to demonstrate the potential for employment opportunities provided by the development, resulting in the equivalent of over 1,000 full time employment positions.

11.2.9 In consideration of the employment opportunities either available or to be delivered through the settlement equate to nearly 8,000 employment positions. This level of employment is well in excess of the Government's eco-town standard of 1 job per dwelling. Through the transport connections and cycleway/footpaths proposed throughout the settlement, the location of these jobs within Education Centres, the main Local Centre and the nearby Fradley Park are ideally accessible.

11.3 Impact on Local Community Facilities

Education

11.3.1 All residential development has the potential to create demand for school places. Schooling is currently compulsory from the age of 5 up to 16 years and the local education authority has a duty to provide primary and secondary school places for such children. From April 2004, each Local Education Authority has also been required to provide a nursery school place for 3 and 4 year olds. This has been taken into account as part of the settlements educational provision.

11.3.2 Taking the population of the settlement into account alongside Staffordshire County Council's methodology of calculating the number of children resulting from a development proposal Curborough would accommodate 1,950 children overall.

Primary Education Provision

11.3.3 In instances where a new development exceeds the level of existing capacity, Staffordshire County Council requires the construction of new primary school facilities integral to the development with appropriate access and servicing. Given the number of potential pupils and the phased build process of the settlement, the application proposes two new purpose built primary schools to accommodate the five forms of pupil entry requirement identified by the County Council. Their provision and location is identified on the amended Illustrative Masterplan at **Figure 3.1**. (In Appendix A)

11.3.4 Based upon the view of Local Education Authority, the development is considered to have the capacity of generating 158 children in each school year group. Consultation with the Local Education Authority at Staffordshire County Council has indicated that an additional 5 forms of entry will be required in regard to existing Primary School educational facilities. Taking this into account it is proposed that for the new primary schools one would be for a 2 form of entry school

(capacity of circa 420 pupils) whilst the other would have 3 forms of entry (capacity of circa 630 pupils).

11.3.5 Taking these sizes into account the minimum and maximum site areas for Primary Education provision are as follows:

- larger primary school site – minimum 27,700sqm; maximum 37,780sqm
- smaller primary school site – minimum 19,300sqm; maximum 25,380sqm

Secondary Education Provision

11.3.6 The secondary school catchment extending across the majority of the application site is the Friary High School, located in Lichfield City. This school is currently over-subscribed and projected to remain full in the foreseeable future. Three other secondary schools serve Lichfield and its surrounding areas, which have a total capacity of 3,531 high school pupils. The County Council predicts a decline in actual pupil numbers to 3,275 by 2011. Although this identifies some level of capacity, it is not sufficient to accommodate the needs of the proposed new settlement. The size of settlement proposed is considered to be large enough to support its own secondary school, offering 158 pupil places per year group. The provision of a secondary school will achieve a high level of self-sufficiency and effectively secure the long term sustainability of the settlement in conjunction with the other community uses and infrastructure proposed.

11.3.7 The minimum site area required for Secondary education provision has been identified by the County Education Authority as 100,960sqm (maximum 132,820sqm). The minimum and maximum total site areas required to accommodate the secondary school and smaller primary school together as a combined complex are 120,260sqm and 158,200sqm respectively.

11.3.8 The amended Illustrative Masterplan generated to inform this application identifies an area of the site for the provision of an educational quarter including a dual complex of a secondary school alongside recreational facilities and the smaller of the two Primary Schools in accordance with the guidelines provided by the County Education Authority.

11.3.9 With regard to Secondary and post-16 provision the 'National Building for Schools' programme and 'Building Schools for the Future' architectural quality scheme have to be taken into consideration as they have been adopted by Staffordshire County Council. Through this exercise the replacement, improvement or construction of new schools is proposed through a Public Private Partnerships Programme enabling the public sector to benefit from the best skills and expertise available in the private sector and reaping greater efficiencies and economies of scale. A number of initiatives from the Department for Children, Schools and Families (DCSF) and Partnerships for Schools (PfS) support the drive to ensure that Building Schools for the Future investment results in well-designed schools which will benefit school staff and pupils and the wider community. The Education and Inspections Act 2006 requires a competition which invites proposers to submit their own high quality architectural proposals to establish the new school.

Delivery

11.3.10 Staffordshire County Council as the LEA have identified that they would require some primary and nursery school provision to be built prior to the first occupation of the phase one housing, which could then be extended at a later date during phase one. The secondary school development land and cost of the build will be agreed through the S106, but if a developer wished to construct the school this would also be acceptable, subject to Staffordshire County Council involvement in the design brief and conformity to DCSF guidelines.

- 11.3.11 The timing of the provision of the schools will be important to ensure that unnecessary stress on existing schools within the City and wider District is avoided, especially in respect of post-16 education. A number of development triggers have been identified by the LEA:
- Trigger 1 – Commencement of phase 1- provide the larger of the primary schools;
 - Trigger 2 – Commencement of phase 2 - provide the secondary school & required site;
 - Trigger 3 – Commencement of phase 3 - provide the second primary school.
- 11.3.12 These triggers reflect what the LEA have requested, the precise delivery of which will be a matter for the S106 negotiations, taking into account other infrastructure delivery requirements such as the Hilliard's Cross junction improvements and sewage treatment facilities.

Additional Environmental Infrastructure

- 11.3.13 In respect of the provision of public open space, play facilities and recreational provision, the proposed settlement incorporates a scale of provision derived from the District Council's draft Open Space, Sport and Recreation guidelines. The proposed settlement incorporates the provision of formal playing pitches, children's play facilities in the form of Local Equipped Areas for Play (LEAPs) and Neighbourhood Equipped Areas for Play (NEAPs), Multi-use Games Areas (MUGAs) and Local Areas for Play (LAPs) as well as strategic landscaping throughout the site. In addition to this, the related S106 agreement will provide a strategy for the continued maintenance of the proposed open space including the proposed dual use recreational facilities based within the Education Quarter.
- 11.3.14 As a result of consultation with the Local Planning Authority and Sport England, the level of on site Public Open Space (POS) has increased by 11.81ha through the reduced extent of the urban form within the site. Most noticeably the level of sport pitch provision has increased to 16.35ha. In addition, the equipped areas of play have been enlarged to meet the Draft SPD requirement of 4.88ha, as well as the area of outdoor sports facilities including facilities such as tennis courts and a cricket pitch.
- 11.3.15 As per the Sport England consultation response, the provision of inside sports facilities has been focused upon a combined sports hall for the co-located primary school and secondary school. This is intended to provide 4 courts, with the second primary school to the south having an extended school hall for activities other than sport, such as arts or other community uses. This provides 5 courts in total all for dual community use. The size of the swimming pool has also been modified, as an 8 lane pool was deemed to be too large, with a 4 lane 25 metre pool considered by statutory consultees to be more appropriate for the likely demand. The dual use facilities within the secondary school grounds now include public changing rooms in the form of a pavilion as illustrated on the revised Illustrative Masterplan, along with additional changing room facilities at the other proposed public sports pitches.
- 11.3.16 The level of casual play space and informal open space have been increased reflecting the retention of a larger proportion of existing woodland and stand-off zones to wildlife habitats. An improved provision of casual play space has been incorporated through the reduction of the residential areas but the area of the perimeter trim trail has been removed from this figure at the request of Sport England due to disagreement over its active recreational value. The trail remains part of the strategic landscape infrastructure.
- 11.3.17 Table 11.2 below demonstrates the level of open space provided on site in comparison with the Local Planning Authority's policy requirements.

Table 11.2 - POS Provision on Site

POS Provision Comparison to Council Standards for Open Space			
Category of Open Space	Facility/Type	Requirement (Ha)	On site Provision (Ha)
1. Built Facilities	Swimming Pool – 0.6 pools/2.4 lane/127sqm Hall – 3.5 courts / 1 hall, 0.14 Indoor Bowls Centre / 1 Rink	N/A	1.0
2. Outdoor sports (pitches)	1.2 ha per 1,000 population –	14.64	16.35
2. Outdoor sports (other)	0.4 ha per 1,000 population –	4.88	4.88
3. Equipped children's play areas	0.4 ha per 1000 population – LEAP - 0.3 ha per 1,000 population NEAP – 0.4ha per 1,000 population	4.88	4.88
3. Casual play space	0.5 ha per 1,000 population –	6.10	70.68
4. Informal open space	0.2ha per 1,000 population –	2.44	
5. District Park	0.8ha per 1,000 population –	9.76	14.26
Land Take		42.70	112.05

- 11.3.18 Sport England has requested the relocation of both the Sprint Course and Go-kart track through their response to the application consultation. The existing Sprint Course site is identified under Local Plan Policy EA12 'Recreation Zone', a policy which also covers the whole of the Curborough application site to the north of Wood End Lane. However, following the SoS Direction letter in September 2007, the policy which seeks to develop the area for recreational purposes has no longer been saved. The Go-Kart is located outside the settlement boundaries of Lichfield and Fradley and is therefore located within open countryside. Discussions have been held with the Shenstone & District Car Club concerning the potential for relocation of the Sprint Course activity, including the applicant offering to make lands within their control available for such a relocation strategy.

Health Care

- 11.3.19 Initial pre-application consultation with the South Staffordshire Primary Care Trust (PCT) had indicated that there was sufficient capacity in the existing General Practices and Hospitals of Lichfield City to accommodate the new settlement. However, the PCT have since indicated through the application consultation process that the provision of separate health facilities is required to facilitate a General Practice surgery as a branch of an existing established practice, as well as a clinic for Family Planning appointments, nurse meetings and baby clinic. Such a facility will now be provided separately within the Local Centre, instead of a health clinic within the Community Centre as previously proposed. This is introduced in the amended description of development and Local Centre land use budget, and is reflected in the revised Illustrative Masterplan.

Conclusion

- 11.3.20 It is concluded that there are no significant adverse environmental effects arising from the proposed development in respect of socio-economic impacts that cannot be satisfactorily mitigated.

12. References

LREW 2008 - Land Registry of England and Wales housing market data, Crown copyright 2008

SCC 2006 - Staffordshire County Council, 'Staffordshire Industrial Estates Survey', 2006

Bat Conservation Trust (2007). *Bat Surveys: Good Practice Guidelines*. Bat Conservation Trust, London. ISBN: 978-1-872745-99-2.

Bibby, C.J., Burgess, N. D., Hill, D. A. & Mustoe, S.H. (2000) *Bird Census Techniques*: 2nd edition. Academic Press, London

Clements, D. K. and Tofts, R.J. (1992). *Hedgerow Evaluation & Grading System (HEGS): A Methodology for the Ecological Survey, Evaluation and Grading of Hedgerows*. Countryside Planning and Management. ISBN: 10:095204370X.

DEFRA (2002) *Working with the Grain of Nature: A Biodiversity Strategy for England*. Secretary of State for Environment, Food and Rural Affairs.

Defra (2007) *Hedgerow Survey Handbook. A standard procedure for local surveys in the UK*. Defra, London. Published by the Department for Environment, Food and Rural Affairs.

Delahay, R.J., Brown, J.A., Mallinson, P.J., Spyvee, P.D., Handoll, D., Rogers, L.M. and Cheeseman, C.L. (2000) The use of marked bait in studies of the territorial organisation of the European badger (*Meles meles*). *Mammal Society, Mammal Review*, **30**, 73-87.

DMRB (2007) Volume 11: Section 3, Part 4: Ecology and Nature Conservation.

English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature. ISBN: 1 85716 568 3.

English Nature (2002) *Barn Owls On Site; A Guide for Developers and Planners*. Available at www.naturalengland.gov.uk

English Nature (2004) *Bat Mitigation Guidelines*. A. J. Mitchell- Jones. English Nature. ISBN: 1 85716 781 3.

Environment Agency Website: www.environment-agency.org.uk

Environment Agency (2003) *Assessment of Noise Disturbance Upon Birds and Dust on Vegetation and Invertebrate Species*.

Environment Agency (1999) *Otters and River Habitat Management*. Environment Agency Second Edition.

Fuller, R.J. (1980) A method for assessing the ornithological importance of sites for nature conservation. **Biological Conservation** **17:229-239**.

Gent, A.H., & Gibson, S.D., eds. (1998) *Herpetofauna Worker's Manual*. Peterborough, Joint Nature Conservation Committee

Gilbert, G., Gibbons, D.W. & Evans, J. 1998. *Bird Monitoring Methods – a manual of techniques for key UK species*. Bedfordshire, The Royal Society for the Protection of Birds.

Harris, S., Cresswell, P. and Jefferies, D.J. 1989 *Surveying Badgers*. London. The Mammal Society.

Hockin, D., Ounsted, M., Gorman, M., Hill, D., Keller, V. & Barker, M. 1992. *Examination of the effects of disturbance on birds with reference to the role of environmental impact assessments*. *Journal of Environmental Management*. 36, 253-286.

IEA (1995) *Environmental Impact Assessment Handbook: A Practical Guide for Planners, Developers and Communities* Thomas Telford Publishing, ISBN 0727727818.

- IEEM (2006) *Guidelines for ecological impact assessment in the United Kingdom*. Institute of Ecology and Environmental Management
- IEEM (2006b) *Guidance on Survey Methodology*. Institute of Ecology and Environmental Management
- JNCC (2003) *Handbook for Phase 1 habitat survey: A technique for environmental audit*. Joint Nature Conservancy Council.
- JNCC (2004) *Bat Worker's Manual* 3rd Edition.
- Multi- Agency Geographic Information for the Countryside Website: www.magic.gov.uk
- Natural England Website: www.naturalengland.gov.uk
- Neal, E. and Cheeseman, C. (1996) *Badgers*. Poyser Books (now taken over by A C Black). ISBN: 0 85661 082 8
- NRA (1993) *Otters and River Habitat Management*. Conservation Technical Handbook Number 3. NRA (EA), Bristol.
- Oldham, R. S., Keeble, J., Swan, M. J. S. and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). *Herpetological Journal*, **10**, 143 - 155.
- Ratcliffe, D.A. (1977) *A Nature Conservation Review*. The Journal of Ecology, Vol. 66, No. 3 (Nov., 1978), pp. 1063-1064
- Regional Biodiversity Strategy for the West Midlands: Restoring the Region's Wildlife (January 2009) <http://www.wmbp.org/strategy/index.html>
- RSPB (2007) *Birds of conservation concern: 2002–2007*. The Population Status of Birds in the UK. RSPB.
- Sargent, G. and Morris, P. (2003) *How to Find and Identify Mammals*. Mammal Trust. Second Edition. ISBN: 10:0906282527.
- Strachan, R. (2006) *The Water Vole Conservation Handbook*. 2nd Edition. The Wildlife Conservation Research Unit, University of Oxford, OX13 5QL
- Treweek, J. (1999) *Ecological Impact Assessment*. Blackwell Science Ltd., Oxford.

Appendix A - Chapters 1-5

- A.1 Figure 2.1 – Application Site Plan RPS1
- A.2 Figure 3.1 – Illustrative Masterplan
- A.3 Figure 4.1 – SHLAA Assessment Site Plans of Fradley: Site 42
- A.4 Figure 5.1 – Minerals Consultation Zone Plan
- A.5 Figure 5.2 – Lichfield District Local Plan – Inset Plan 12: Fradley
- A.6 Figure 5.3 – Staffordshire Minerals Core Strategy Key Diagram
- A.7 Figure 5.4 – Staffordshire Minerals Core Strategy Site Proposals 2008
- A.8 Figure 5.4b - Staffordshire Minerals Core Strategy Submitted site proposals update February 2009
- A.9 West Midlands Regional Spatial Strategy Phase Two Revision Preferred Options Submission Representations On Behalf of The Curborough Consortium December 2008
- A.10 Lichfield District Local Development Framework Core Strategy Preferred Options Representations On Behalf of The Curborough Consortium January 2009

Appendix B - Ecology and Nature Conservation Chapter 6

- B.1 Figure 9.1 Phase 1 Habitat Survey
- B.2 Figure 9.2 Badger Bait Marking Results
- B.3 Figure 9.3a Ponds for Great Crested Newts
- B.4 Figure 9.3b Ponds assessed for Great Crested Newts Potential (letters)
- B.5 Figure 9.4a Bat Activity Map (Overall)
- B.6 Figure 9.4b Location of confirmed bat roosts
- B.7 Figure 9.4c Walked Bat Transect 1 – Park and Ride 6.05.08
- B.8 Figure 9.4d Walked Transect 2 –Tertiary Road 30.05.08
- B.9 Figure 9.4e Walked Transect 3 –Secondary Road Link 27.05.08
- B.10 Figure 9.4f Walked Transect 4 –12.06.08 (Fradley Wood) WWII Hangars
- B.11 Figure 9.4g Walked Transect 5 – 12.05.08 The Spinney (Fradley Wood)
- B.12 Figure 9.4h Walked Transect 6 – 17.05.08 (land south of Wood End Lane)
- B.13 Figure 9.4i Walked Transect 7 – 17.06.08 (land around Wood End Lane)
- B.14 Figure 9.4j Walked Transect Hedgerows East of Rose Cottage 17.06.08
- B.15 Figure 9.4k Walked Transect 9 (Netherstone Lane) 01.07.08
- B.16 Figure 9.4L Walked Transect 10 (Fradley Wood)
- B.17 Figure 9.5 Riparian Mammal survey updated May 2008
- B.18 Figure 9.6a Breeding Bird Map 1
- B.19 Figure 9.6b Breeding Bird Map 2 (Land South of Wood End Lane)
- B.20 Figure 9.6c Breeding Bird Map 3 (Curborough Farm to East Hill)
- B.21 Figure 9.6d Breeding Bird Map 4 (Tertiary Road Link)
- B.22 Figure 9.6e Breeding Bird Map 5 (Secondary Road Link)

- B.23 Figure 9.6f Breeding Bird Map 6 (Park and Ride)
- B.24 Figure 9.7 Wintering Bird Survey Transect
- B.25 Figure 9.8 Hedgerow Survey
- B.26 Figure 9.9 Invertebrate Survey
- B.27 Figure 9.10 Off-site Grassland Mitigation
- B.28 Invertebrates recorded from Fradley Wood and surrounds, Curborough; September 2008
- B.29 UK BAP moths recorded from Fradley Wood (list provided by Staffordshire wildlife trust)
- B.30 Curborough, Staffordshire: Invertebrate Survey – Report to RPS Group Plc
- B.31 Curborough Staffordshire: Ecology Badger Bait Marking Survey 2008
- B.32 Curborough Staffordshire: Ecology Updated Bat assessment 2008
- B.33 Curborough Park and Ride and Access Roads: Appendix 9.6b Breeding Bird Assessment
- B.34 Curborough Staffordshire: Ecology Updated Great Crested Newt Survey 2008
- B.35 Curborough Staffordshire: Ecology Updated Hedgerow Report 2008
- B.36 Curborough Staffordshire: Ecology Riparian Mammal Survey
- B.37 Curborough Staffordshire: Ecology Wintering Bird Assessment

Appendix C - Landscape
Character and Visual Impact
Chapter 7

- C.1 Figure 10.1 Topography and Viewpoints
- C.2 Figure 10.2 Landscape Character
- C.3 Figure 10.4 Visual Envelope-Existing Site
- C.4 Figure 10.5 Landscape Master Plan (Illustrative)
- C.5 Figure 10.6 Zone of Visual Influence and During Construction/On Completion
- C.6 Figure 10.7 Zone Of Visual Influence and Visual Impact Assessment 20 Years after Completion
- C.7 Site Photographs (New photo sheets 5 sheets)
- C.8 Analysis of Tree Condition Survey (5 sheets)
- C.9 Tree and Hedgerow Retention/Removal (5 sheets)
- C.10 Landscape Character Area 67 and Landscape Character Area 68
- C.11 Staffordshire Historic Landscape Character Map (3 sheets)
- C.12 Plant Schedule
- C.13 Landscape Impact Table L1
- C.14 Visual Impact Table L2
- C.15 Lichfield District Council TPO No 1-1959; No 175-1997; Alrewas; No 3; and No 23
- C.16 Landscape Management Framework
- C.17 Figure 10.11 Additional Viewpoints
- C.18 Staffordshire Landscape Character Types

Appendix D - Hydrology and Water Quality Chapter 8

- D.1 11.A Updated Services Report
- D.2 11.B British Waterways Correspondence for section 11
- D.3 11.B Curborough BrK_Buildings
- D.4 11.C British Waterways Correspondence for section 11
- D.5 Curborough Development Fluvial Hydraulic Model Figure A1
- D.6 Curborough Development Fluvial Hydraulic Model Results Figure A3
- D.7 Curborough Development Lidar Coverage Figure A4
- D.8 Curborough Brook Cross Sections
- D.9 Curborough Flood Risk Study (s-curb 11 – 24)
- D.10 Curborough /Pyford Brook Model Schedule
- D.11 Schedule of Structures
- D.12 CURB_2770 – Curborough Development Fluvial Model Build and Validation
- D.13 Calculations of Manning’s ‘n’
- D.14 Curborough Development: Curborough /Pyford Fluvial Hydraulic Model Build and Validation Report

Appendix E – Land Use, Geology and Soils

Chapter 9

E.1 David Walker Minerals Survey Report